Department of Computer Science, IT & Computer Applications

of

SHRIMATI INDIRA GANDHI COLLEGE

Nationally Accredited at 'A' Grade (3rd Cycle)
by NAAC Tiruchirappalli 620 002

organizes

International Conference on Cloud Computing - Emerging Trends and Technologies

Venue:

Vidya Seva Ratnam
Shri K. Santhanam Auditorium

Date: 10.03.2023

Knowledge Partner

ICT ACADEMY

Conference Proceedings

TWO DAYS INTERNATIONAL CONFERENCE

ON

CLOUD COMPUTING – EMERGING TRENDS AND TECHOLOGIES

KNOWLEDGE PARTNER

ICTACADEMY

10th & 11th MARCH, 2023

DEPARTMENT OF COMPUTER SCIENCE, IT & COMPUTER APPLICATIONS

SHRIMATI INDIRA GANDHI COLLEGE

(Nationally Accredited at "A" Grade (3rd Cycle) by NAAC)

Tiruchirappalli – 620 002 Tamil Nadu, India.

Editors :
Ms. N. Vijayalakshmi,
IQAC Coordinator & Head,
Ms.V.Kiruthika,
Dr.M.Gomathy,
Asst. Professors in Computer Science, IT & Computer Applications,
Shrimati Indira Gandhi College, Trichy-2

ISBN: 978-93-93253-77-4

Publisher: Ryan Publishers
B-3, Lakshmi Pride, 80 feet road, 10th Cross West,
Thillai Nagar, Trichy- 620018, Tamil Nadu, India.
Website: www.ryanpublishers.co.in
Email: editor@ryanpublishers.co.in
Ph: +91 6374561101

CONTENTS

RYAN PUBLISHERS

B-3, LAKSHMI PRIDE,
80 FEET ROAD, 10TH CROSS WEST
THILLAINAGAR,
TIRUCHIRAPPALLI, 620018,
TAMIL NADU, INDIA
Email-contact@ryanpublishers.co.in
editor@ryanpublishers.co.in
website- www.ryanpublishers.co.in

ISBN 978-93-93253-77-4

Follow us on:-

CLOUD COMPUTING FOR ACADEMIA

Ms. Viji Parthasarathy,

Asst Professor, Department of Computer Science, IT and Applications
Tiruchirapalli, Tamilanadu, India
vijiparthasarathy@sigc.edu

ABSTRACT

A new generation of virtualization has paved the way for the development of cloud computing, which plays an important role in the IT filed, which opens the way to Educational field also. Students have the facility to use the e-content of the universities and educational institutions. They also used to see their results online. These tasks take much time to process. Cloud computing is one of the technologies driving innovation in this industry. Virtual resources are emphasized over physical ones in cloud computing, which is a complex technology. The concept of the Community Cloud is new and developing and in between Public Cloud and Private Cloud. Community cloud is an infrastructure which can be shared by more than two organization. This paper gives an overview on cloud computing and an analysis about community cloud in educational institution and universities.

KeyWords: Cloud Computing, Virtual Resources, Remote Servers, On Demand Services, Pay-as-you-go.

INTRODUCTION

Today, learners are always connected with world, regardless of whether they are near or far from their educational institutions. Teaching and learning are no longer restricted to text books and classrooms. It extends to online gadgets like laptops and mobiles. An emerging paradigm in education is e-learning. The concept of networked information and communication technology (ICT) is used for teaching and learning. It is commonly referred to as e-learning or e-learning technology. As students, faculty, and non-teaching around the world prefer e-content, so that they can learn or study asynchronously.

It is difficult to imagine how a student from a faraway country could pursue a course at college thousands of miles away. Cloud computing is one of the technologies driving innovation in this industry. Virtual resources are emphasized over physical ones in cloud computing, which is a complex technology. Getting a clear understanding of how cloud computing works and how it affects education is important.

In cloud computing, various hardware and software services are delivered via the internet through a network of remote servers. These servers store, manage, and process data so that clients can expand or upgrade their current infrastructure.

More precisely we may define cloud computing as on-demand services to utilize hardware, software, applications, and database. Users can get all these services at any time and from anywhere. Cloud functions are distributed at various locations with data centers. It relies on sharing computer resources as a pay-as-you-go scheme. Cloud computing services enable educational institutes and universities to increase connectivity, accessibility, and availability among educators and reduce overall expenditure.

A well-rounded education aids people in becoming better citizens, securing better-paying jobs, and demonstrating moral standards. E-learning becomes the part and parcel of the learner's life.

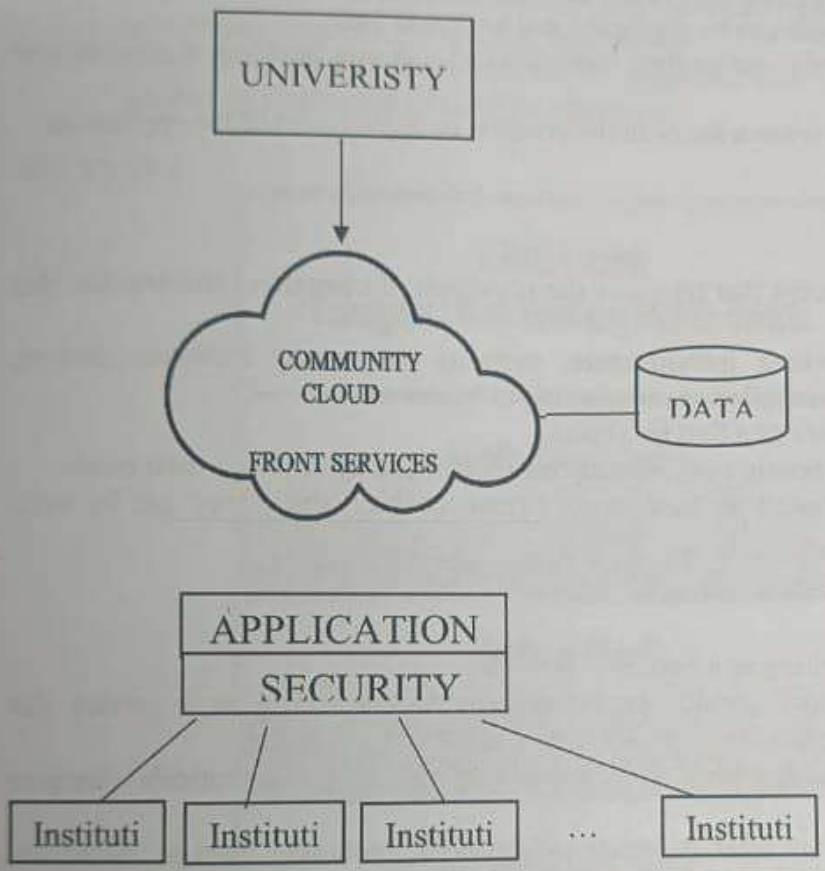
A variety of sites, forums, and blogs are available to learn the unlearning concepts. Very big thanks to Information and Communication Technology and Google Platforms.

Educators and learners started using e-content from distributed locations. Moreover, online systems automatically provide e-forms for exam applications, registrations, research entrance procedures, and e-hall tickets and it calculates exam results and makes them available for viewing or emailing just minutes after they are calculated. Online software support to distribute workloads, and syllabus.

Many hackers eye on the user's behavior. The problem is that data are not secured and the platform

cannot be authenticated. Some may not know about the technology. E-learning could be stagnated in some places.

The first section of this paper discusses the services of cloud computing. There are models available on-premises as well as on demand. This also explains briefly the pricing models and savings models. The 2nd section elaborates on the front services. The third section discusses the functions of universities and Educational institutions. Section fourth discusses the brief note on the implementation of cloud at universities and educational institutions with the conclusion. It provides information about the service providers and proposes a model with low cost, security, and operational efficiency. Section five concludes the paper with the expected results.



SECTION 1:

Services of Cloud Computing:

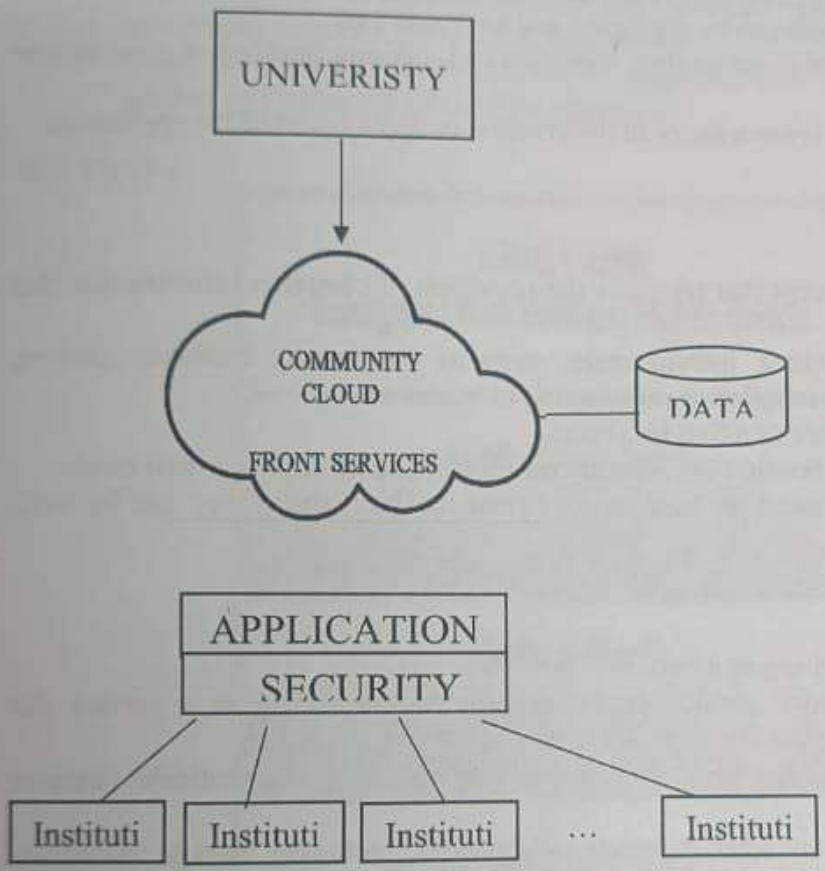
- Software as a service (SaaS)
- Platform as a service (PaaS)
- Infrastructure as a service (IaaS)
- Anything as a service (XaaS)
- Function as a Service (FaaS)

Software as a service (SaaS)

- Software-as-a-Service (SaaS) is a technique for providing applications and services through the Internet.
- We may avoid the difficulties of software and hardware management by just accessing software through the Internet instead of installing and maintaining it.
- It eliminates the requirement to install and run apps on our personal computers or in data centers, thereby saving on hardware and software maintenance costs.

cannot be authenticated. Some may not know about the technology. E-learning could be stagnated in some places.

The first section of this paper discusses the services of cloud computing. There are models available on-premises as well as on demand. This also explains briefly the pricing models and savings models. The 2nd section elaborates on the front services. The third section discusses the functions of universities and Educational institutions. Section fourth discusses the brief note on the implementation of cloud at universities and educational institutions with the conclusion. It provides information about the service providers and proposes a model with low cost, security, and operational efficiency. Section five concludes the paper with the expected results.



SECTION 1:

Services of Cloud Computing:

- Software as a service (SaaS)
- Platform as a service (PaaS)
- Infrastructure as a service (IaaS)
- Anything as a service (XaaS)
- Function as a Service (FaaS)

Software as a service (SaaS)

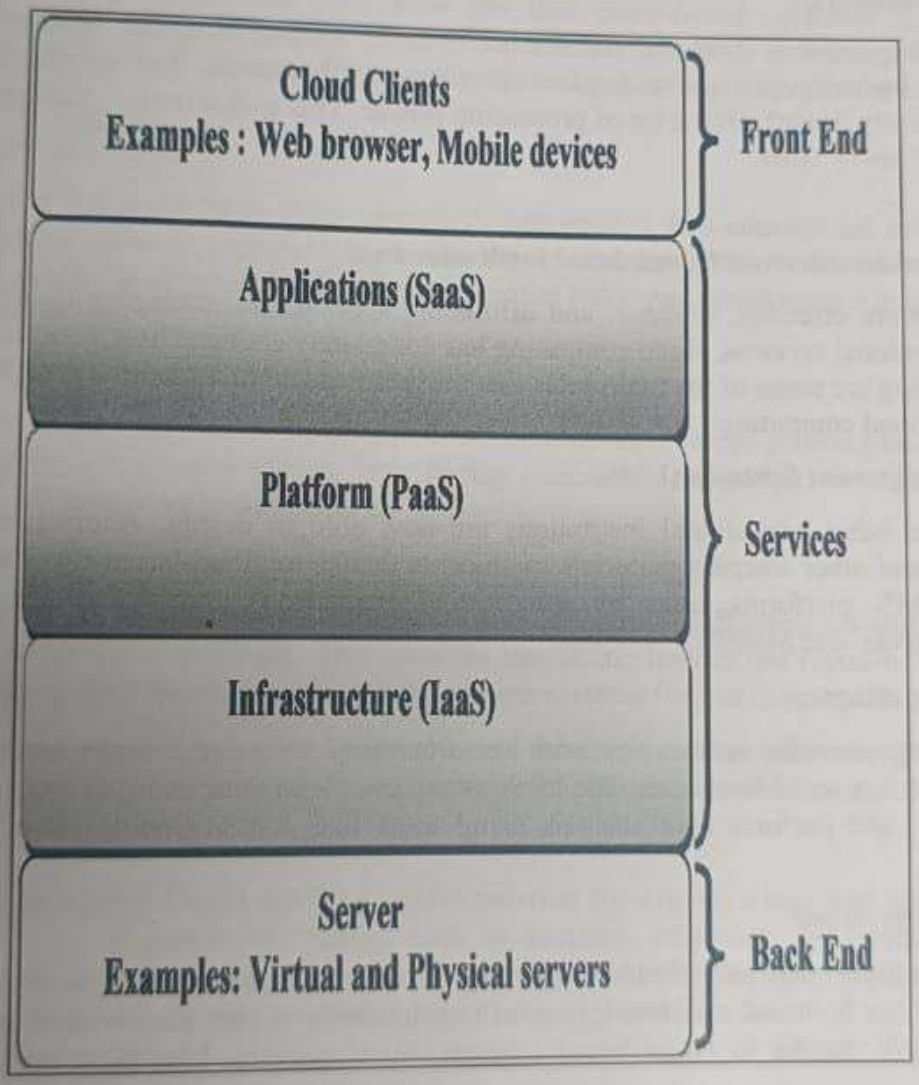
- Software-as-a-Service (SaaS) is a technique for providing applications and services through the Internet.
- We may avoid the difficulties of software and hardware management by just accessing software through the Internet instead of installing and maintaining it.
- It eliminates the requirement to install and run apps on our personal computers or in data centers, thereby saving on hardware and software maintenance costs.

- Tiered Pricing: There are different levels available for cloud services. For a certain price, each tier provides fixed service agreements. Pricing like this is used by Amazon EC2.
- Price per unit: The model is built on the idea of unit-specific services. This paradigm includes memory allocation and data transport for particular units. This sort of pricing, expressed as RAM/hour, is used by Go Grid.
- Subscription-based Pricing: In this model, consumers pay recurring subscription fees to access the product.

Saving model: The following are a few of the cloud's most well-liked cost-saving model advantages:

- There are no up-front hardware and software purchases (CAPEX)spending less on networking, security, computing, and storage
- Costs associated with maintenance, upgrades, and operations significantly reduced the number of employees focused on operations

SECTION 2:



Front services:

Any user-facing component of the cloud computing architecture is referred to as front-end architecture. The user experience is made up of several smaller components that make up this area with which the end user interacts. User interfaces, which are a common component of front-end architecture, are crucial to how users engage with cloud computing applications. Nowadays, front-end cloud software architecture will be primarily used by working IT experts. Web browsers, local networks, and popular web apps are a few examples of front-end architecture. The front-end architecture of Gmail, a well-known cloud service utilized by millions of people every day, is a web

application. Users can access the services provided by the Gmail infrastructure as a whole using the interface.

Three elements make up front-end architecture:

Software

The software that enables cloud computing applications to be run from the user's side is included in front-end software architecture. The front-end software architecture in the web-powered world of today typically appears in the form of a web browser or client-side application.

User Interface

By using a cloud service, the end user works directly with the user interface. This covers the email sending and receiving interface in Gmail as well as the text editor in programs like Google Documents. The user interface and software architecture may, however, combine in some circumstances.

Client Device/Network

An essential component of front-end architecture is the client-side hardware or network. The user's computer and input devices are examples of client-side hardware. The client device in cloud computing typically doesn't need a lot of processing power. This is due to the cloud processing of the majority of the "heavy" jobs.

SECTION 3:

Functions of universities and Educational institutions

By offering a more effective, scalable, and affordable approach to managing IT infrastructure and delivering educational services, cloud computing has completely changed how educational institutions operate. Following are some of the main roles that universities and other learning institutions play that can gain from cloud computing:

Learning Management Systems (LMS):

Universities and other educational institutions are now able to design, administer, and distribute online courses and other learning materials to students thanks to cloud-based LMS systems. Popular cloud-based LMS platforms used by educational institutions throughout the world include Blackboard, Canvas, and Moodle.

Research Computing:

Cloud computing provides universities with the flexibility to manage large amounts of data for research projects in a scalable manner. Researchers can use cloud computing to process large datasets, run simulations, and perform data analysis using tools like AWS, Google Cloud, and Microsoft Azure.

Administrative Systems:

Education institutions can use cloud computing to automate administrative processes including student registration, financial assistance, and billing. Institutions may access data instantly and have centralized control thanks to cloud-based administrative systems like Workday, Salesforce, and Ellucian.

Collaboration and Communication:

Students, teachers, and administrators can collaborate on projects and communicate easily from any location with an internet connection thanks to cloud-based solutions like Google Workspace and Microsoft 365.

Online Libraries:

Universities can store, administer, and offer educational resources to students from any location thanks to cloud-based digital libraries. Universities can access journals, books, and other instructional materials digitally thanks to services like ProQuest and EBSCOhost.

In general, cloud computing allows colleges and universities to offer superior educational services more effectively and at a lesser cost. By using cloud-based solutions, educational institutions can concentrate on giving students a top-notch education while leaving the technological details to cloud service providers.

SECTION 4:

The implementation of cloud computing at universities and educational institutions typically involves the following steps:

Assess the current IT infrastructure:

Universities and educational institutions should evaluate their current IT infrastructure to find areas that could profit from cloud-based solutions before deploying cloud computing. This entails assessing the existing networking, software, and hardware to identify which systems can be moved to the cloud.

Identify cloud-based solutions:

Universities and other educational institutions can find cloud-based solutions that address their specific demands after evaluating their current IT infrastructure. This involves identifying cloud-based collaboration tools, administrative systems, research computing platforms, and learning management systems.

Develop a migration plan:

Once cloud-based solutions have been identified, universities and educational institutions should develop a migration plan to transition their existing systems and data to the cloud. This includes developing a timeline for migration, identifying potential risks, and developing a contingency plan in case of any issues during the migration process.

Implement cloud-based solutions:

Educational institutions can start using cloud-based solutions after the migration plan is in place. This entails establishing cloud-based servers, transferring data, and configuring cloud-based software to suit the institution's particular requirements.

Train staff and users:

Finally, educational organizations like universities should instruct staff members and users on how to use the newest cloud-based solutions. This involves instructing how to use cloud-based collaboration tools, administrative systems, and learning management systems for use in research.

Overall, to achieve a smooth transition to cloud-based solutions, the introduction of cloud computing at universities and educational institutions requires careful planning, execution, and training.

CONCLUSION

In conclusion, Community Cloud can be a useful solution for organizations that need to collaborate with a specific group of people or entities, such as partners, customers, or members of a certain industry or community. By leveraging a shared cloud environment, organizations can provide their community members with access to shared resources, applications, and data while maintaining a secure and controlled environment.

However, it's important to note that Community Cloud may not be suitable for every organization. Factors such as the size of the community, the complexity of the applications and data, and the need for customization may impact the feasibility and cost-effectiveness of a Community Cloud solution.

Community Cloud can be a useful tool for organizations looking to improve collaboration and communication among a specific group of people or entities especially for Academic institutions , Universities and Colleges. However, careful consideration of the specific needs and requirements of the organization and its community members is necessary to determine the viability of a Community Cloud solution.

However, it's important to note that Community Cloud may not be suitable for every organization. Factors such as the size of the community, the complexity of the applications and data, and the need for customization may impact the feasibility and cost-effectiveness of a Community Cloud solution.

Community Cloud can be a useful tool for organizations looking to improve collaboration and communication among a specific group of people or entities especially for Academic institutions , Universities and Colleges. However, careful consideration of the specific needs and requirements of the organization and its community members is necessary to determine the viability of a Community Cloud solution.

AN ANALYSIS OF EDGE RECOMMENDATION FOR CLOUD SERVICE PROVIDERS

M.Kohila , Dr.S.Retthinavalli , P.Ananthi

Assistant Professors in Department Computer Science
Shrimati Indira Gandhi college, Tiruchirapalli-24.

ABSTRACT

The inventions and the advanced technology of computer science do not fulfill and meet the reliability and safety to protect the data from the inside and outside attackers in data storage devices. To protect data and speed up the process in all departments like Bank, IT Companies, hospitals, factories, public and private concerns etc., they would always like to prefer uninterrupted as well as safe success in their fields. The combined functions of Cloud Server (CS) and Edge System (ES) play a vital role to fulfill their need and achieve their task. The detailed analyses of existing research do not fulfill the each and every user's optimization. Each and every type of user requires different type of Cloud Server as well as Edge System when they prefer capacity of Data storage device at reasonable cost. It varies from one user to another. Based on this optimization, there is no recommendation to prefer the Cloud Storage and Edge System in the existing studies but the novelty of this present paper is about the Edge Recommender which monitors both Cloud Server as well as Edge System simultaneously to secure data with reliability for different users. We have optimized recommendation of edge system based on the feedback of the user. To prove this task, i9 processor with 16 GB RAM server through which nearly 25 Edge Systems and Cloud Servers have been monitored and examined again and again. Similarly, 92% of accuracy has been attained nearly by executing this process.

Keywords: Cloud Server, Edge System, User Optimization, Edge recommender, Security, reliability.

INTRODUCTION

Edge System is nothing but on-premise data center where computing power is centralized. In our day-to-day life, Edge System takes part in a huge role when we use the devices like smart phones, speakers, watches which are locally collecting and processing data while touching the physical world. Edge integrates centralized and distributed architectures. Cloud and the edge work hand in hand to enable new experiences. Data is generated or collected in many locations and then moved to the cloud where computing is centralized, making it easier and cheaper to process data together in one place and at scale.

Heterogeneous Bibliographic Network (HBN) and Deem Citation Recommendation have been constructed as Edge prediction problem whereas Network Representation based Edge Prediction has also been developed and recommended. [1] To enable the data processing capabilities with physical components, Edge computing has been adopted. It is a complementary server to cloud. [2] The conceptual architecture, design and the recommendation for the IoT Edge-based Healthcare Management system have been presented to diagnose as well as archive medical data of patients across different points of the system. [3] A multi-attention mechanism is designed to form a deep feature representation through which the attribute attention vector and the network embeddings are concatenated. [4] The valuable advantage of Edge terminal device is its portability. The mobile devices and Location-Based Social Networks (LBSN) have been utilized by the people when they have travel plans. [5]

HYPOTHESIS

It is an essential and unavoidable device in our day-to-day life that edge computing takes part in a huge role when we use the devices like smart phones, speakers, watches which are locally collecting and processing data while touching the physical world. Vehicles run with sensors, Robots, Internet of Things (IoT) devices, Point of Sales (PoS) are technically computed with the

edge computing center to prove the Scientific advancement of technologies is based on edge computing systems.

The following features can be attained by using Edge Computing Systems:

- Rapid response between the Sender and the Receiver
- High data volume which is used to increase the storage capacity
- Privacy and confidentially maintained data
- Autonomous operations and individuality
- Intelligent machines and real-time productivity
- Optimized close to consumption

EDGE RECEOMMENDATION

Edge Recommendation engine is a subclass of Machine Learning (ML) which deals with ranking or rating products / users. It is defined as a system which predicts rating a user by whom the specific item given. This prediction will then be ranked and returned to the user. It is usually used by various large companies like Google, Instagram, Twitter, Face Book, Amazon, Netflix, Sportify etc., To build the Edge recommender systems, many different ways are followed. Algorithmic and formulaic approaches like Page Rank and Modelling centric approaches like collaborative filtering are pioneers in this recommendation. Even though all these approaches vary in complexity, they do not have exact performance. Sometimes, perfect result can be attained by simple solutions and implementations. This paper provides a few different variations on a sample generated dataset through the recommendation system architecture.

ALGORITHM

Edge Recommendation (ER) is essential concept between the Cloud Server (CS) and Edge System (ES). Based on the data stored by the client, the data storage space is cleared while data doing deduplication. If the storage space is insufficient in CS, the data which are in queue will be stored in ES. The usage of ES varies from one user to another. Based on the cost, speed, reliability, scalability and the cepacity space of Randum access Memory (RAM) of Edge Server, the user decide the ES. To analyse the genuiness of the Edge Server, the following precess is executed repeatedly. First of all, the ES is recommended based on its reliability and the feedback of the users in which the Mechine Learing(ML) experiments are done. The functions of Edge Analyser (EA) are to verify Edge configuration, its quality and classification. There is a correlation between checking of Edge integrity and its configuration. Some users need the Edge at the rate of reasonable cost, some do not bother about cost but its confuguration and reliability. To fulfill the necessity of the different users, this paper analyses the different concept from the existing one.

CONCLUSION

Thus, the edge computing is very clear which unlocks valuable data to shape new opportunities and innovation for the future. More sensors generate more data, and there is more processing at the location where the data is created—which is faster, more reliable and safer.

REFERENCES:

[1] Yang Libin, Zhang Zeqing, Cai Xiaoyan and Guo Lantian: Citation Recommendation as Edge Prediction in Heterogeneous Bibliographic Network: A Network Representation Approach, Received January 18, 2019, accepted February 13, 2019, date of publication February 18, 2019, date of current version March 5, 2019. Digital Object Identifier 10.1109/ACCESS.2019.2899907

[2] Queiroz Jonas, Leitão Paulo and Oliveira Eugénio : A Fuzzy Logic Recommendation System to Support the Design of Cloud-Edge Data Analysis in Cyber-Physical Systems, Received 16 January 2022; revised 8 February 2022; accepted 13 February 2022. Date of publication 22 February 2022; date of current version 7 March 2022. The review of this paper was arranged by

Associate Editor Doriana Marilena D'Addona. Digital Object Identifier 10.1109/OJIES.2022.3152725

[3] Ahmad F. Subahi : Edge-Based IoT Medical Record System: Requirements, Recommendations and Conceptual Design Received June 9, 2019, accepted June 29, 2019, date of publication July 10, 2019, date of current version July 30, 2019. Digital Object Identifier 10.1109/ACCESS.2019.2927958

[4] Jibing Gong, Yi Zhao and Shuai Chen : Hybrid Deep Neural Networks for Friend Recommendations in Edge Computing Environment, Received November 6, 2019, accepted November 24, 2019, date of publication December 10, 2019,date of current version January 17, 2020.Digital Object Identifier 10.1109/ACCESS.2019.2958599

[5] Cao Keyan, Guo Jingjing, Meng Gongjie: Points-of-Interest Recommendation Algorithm Based on LBSN in Edge Computing Environment, Received February 27, 2020, accepted March 8, 2020, date of publication March 10, 2020, date of current version March 18, 2020. Digital Object Identifier 10.1109/ACCESS.2020.2979922

[6] Bandi Ajay and Ariel Hurtado Julio : Edge Computing as an Architectural Solution:An Umbrella Review, Northwest Missouri State University, Maryville MO 64468, USA.

[7] Sun Chuan, Li Hui and Li Xiuhua : Convergence of Recommender Systems and Edge Computing: A Comprehensive Survey, 1Key Laboratory of Dependable

[8] Service Computing in Cyber Physical Society (Chongqing University), Education Ministry, China (e-mail:lixiuhua1988@gmail.com), School of Big Data & Software

[9] Engineering, Chongqing University, Chongqing 401331, Digital ObjectIdentifier 10.1109/ACCESS.2017.

[10] Kotsogiannis Ios, Duke University (iosk@cs.duke.edu), Zheleva Elena, University of Maryland (elena@cs.umd.edu), Machanavajjhala Ashwin and Duke University, (ashwin@cs.duke.edu) : Directed Edge Recommender System

MACHINE LEARNING IN DAIRY FARMING

V.Manibabu[1], Dr.M.Gomathy[2]

Department of Computer Science, Shrimati Indira Gandhi college Trichy-2
[1]E-mail: babvem79@yahoo.com

Department of Computer Science, Shrimati Indira Gandhi college Trichy-2
[2]E-mail: gomathim@sigc.edu

ABSTRACT

Machine learning (ML) is nothing but Artificial Intelligence that tackles complicated issues that are not able to conclude by using conventional method. ML is used in all walks of life that is setting of datasets. The scientific study of algorithms and statistical models that computer systems use to perform a dairy forming without being explicitly programmed. Learning algorithms in many applications. Machine Learning is not only used in Robotic methods but also used in all fields such as the detection of lameness, the prediction of the calving time and the detection of early-stage mastitis Mining, Dairy forming, Plants and trees etc. In this paper, I describe how machine learning works in Daily forming work related field. For e.g. By using ML programmes, we can identify and find out the root causes of diseases that affects our cows. In addition to this ML helps us to protect cows in dairy farming. In dairy farming work, Machine learning algorithms were used to predict metabolic disorders in dairy cows and milk production. This can help farmers take preventive measures to improve the health of their cows and reduce production costs.

Keywords: Algorithms, Machine Learning

1. INTRODUCTION

A branch of artificial intelligence called machine learning (ML) employs sophisticated algorithms to tackle complicated issues that are tough to resolve using conventional methods (Rebala et al., 2019). A prediction model is created by the parameters and the algorithm. An algorithm can determine the best parameters for the method using a training dataset. In order to assist in decision-making regarding the projected outcome, a prediction model is used to forecast the result for a certain set of values of the attributes utilised. To determine how well the prediction model performs, it is tested against a validation dataset that contains features and the accompanying outcomes that were not utilised in the model's training. Building a highly accurate prediction model has a number of obstacles, such as which characteristics to use, what algorithms to select, and how to handle vast volumes of data, even though the process of training, testing, and applying ML models is simple.

In the dairy industry, ML is already being applied in a variety of applications, such as the detection of lameness, the prediction of the calving time and the detection of early-stage mastitis (Taneja et al., 2020, Keceli et al., 2020, Dhoble et al., 2019) using data from milking robots. The term Big Data can be defined as the existence of large data sets and that need adequate tools to deal with this large volume of data and from this medium, information can be extracted for decision making (Morais et al., 2018). According to Shivappa et al. (2018) Big Data has three main characteristics or dimensions, described as: the volume defined as a set of data whose size is beyond the processing capacity of a conventional database; the speed that is the ability to acquire, process, understand and interpret data in real time; and the variety in which it refers to the number of data types, such as messages, photos, videos and sounds. Morais et al. (2018) still include two more dimensions: veracity (constant need for real-time analysis) and value (indicates that the greater the wealth of data, the better the questions will be at the beginning of the analysis process)

2. RELATED WORKS

SOME OF THE RECENT STUDIES INVOLVED MACHINE LEARNING AND BIG DATA IN DAIRY FARMING

Machine learning algorithms were used to predict metabolic disorders in dairy cows based on data collected from electronic tags that monitored the cows' behavior and milk production and found that the

machine learning models were able to accurately predict metabolic disorders in the cows. This can help farmers take preventive measures to improve the health of their cows and reduce production costs (Kizilkaya et al. (2018)

Wathes et al .2018 use of big data analytics in dairy farming and identified several potential benefits, such as improved milk yield, reduced labor costs, and improved cow health. They highlighted the need for better data integration and standardization to enable more effective big data analysis in dairy farming. Brizuela et al. 2019 optimized the prediction of cow fertility and identifying factors that affect milk production. The use of big data analytics can help farmers make more informed decisions about herd management, which can lead to increased milk production and profitability.

Sensors and other technologies to monitor and manage the health and productivity of individual cows and probable reasons for improved reproductive efficiency, reduced feed costs, and better disease management were identified by Zhao et al. (2019):

Factors that affect milk quality and safety, such as temperature, pH, and bacterial content were used as variables and identified the factors to improve the quality and safety of milk, which can have significant economic and health benefits. Singh et al. (2020

Hogeveen et al. (2019) highlighted the importance of data-driven decision making in dairy farming and provided examples of how big data analytics can be used to optimize various aspects of dairy farming, such as feeding practices, reproduction management, and disease prevention.

Overall, these studies demonstrate the diverse applications of big data analysis in dairy farming, ranging from precision farming to milk quality and safety. By leveraging the power of big data analytics, farmers can improve the efficiency, productivity, and sustainability of their dairy farming operations, while also ensuring the health and well-being of their cows and the safety of their products.

3. METHODOLOGIES INVOLVED

A Systematic Literature Review (SLR) is used to gather and summarize the state-of-the-art on a certain research topic (Kitchenham et al., 2007). An SLR should be a fair and comprehensive assessment of the state-of-the-art, and this is achieved by defining an SLR protocol in advance (Kitchenham et al., 2007) This SLR study follows the guideline of Kitchenham et al. (2007) entitled "Guidelines for performing Systematic Literature Reviews in Software Engineering".

One particular study should focus some search questions viz., What kind of problems are solved using ML and what ML tasks are these problems mapped into? Independent and dependent variables to build the ML models? what algorithms are applied for the models? which evaluation approaches are used? etc.

Similarly, the search string will be varied with database set like science direct, web of science etc., Mostly "machine learning" AND "dairy farming" "Milk*" ("Milk*") AND ("dairy farm*" OR "dairy industry" OR "dairy cow*" OR "dairy cattle") may be used. This search string was used to search the databases in the abstract, article title, and keywords fields. Selected publications will be used to perform snowballing. Snowballing is a search technique that uses the already identified publications to find additional ones. Publications retrieved by snowballing will be checked using the study selection criteria.

According to database, the search string has to be changed. ScienceDirect does not allow wildcards, we must use up to eight AND/OR operators. So, "Milk*" can be changed to just "milk" in the ScienceDirect search string, and "dairy farm*" or "dairy industry" or "dairy cow*" or "dairy cattle" was changed to "dairy." Like Wiley, Springer Link doesn't search in the abstract, article title, or keywords, so the search string was used to look anywhere in the publication. Here are the search strings for each database: Scopus, Web of Science, IEEE, Wiley, and Springer Link: ("Milk*") AND ("dairy farm*" OR "dairy industry" OR "dairy cow*" OR "dairy cattle") AND ("machine learning" OR "machine-learning" OR "artificial intelligence" OR "computational intelligence" OR "data mining"). Milk AND Dairy AND ScienceDirect ("machine learning" OR "machine-learning" OR "artificial intelligence" OR "computational intelligence" OR "data mining").

CONCLUSION

Artificial intelligence (AI) is, driven by ongoing advances in the accessibility of significant information, calculation, and algorithms in dairy farming. The most improved accuracy data about dairy management is being identified and estimated. with an advanced data and understanding the concept will give the vast prediction, empowering dairy management frameworks. Machine learning and big data analysis will reveal the significant of data improvement about dairy management.

REFERENCES

[1] Kizilkaya, K., Moeckel, R., & Beasley, D. (2018). Machine learning for predicting metabolic disorders in dairy cows. Journal of Dairy Science, 101(6), 5236-5244.

[2] Wathes, C. M., Kristensen, H. H., Aerts, J. M., & Berckmans, D. (2018). Big data analytics for improving dairy farm management. Journal of Dairy Science, 101(5), 3721-3731.

[3] Brizuela, C. M., Buhr, R. J., Graves, K. L., Warkentin, T. D., & Shike, D. W. (2019). Using big data to optimize dairy herd management. Journal of Dairy Science, 102(10), 9173-9183.

[4] Zhao, Y., Zhou, H., Chen, X., Huang, J., Zuo, Y., & Wang, J. (2019). Application of big data in precision dairy farming. Journal of Animal Science and Biotechnology, 10(1), 1-10.

[5] Singh, R., Goswami, T. K., & Kumar, A. (2020). Big data analytics for improving milk quality and safety. Journal of Food Science and Technology, 57(3), 737-745.

[6] Hogeveen, H., Steeneveld, W., & Ouweltjes, W. (2019). Data-driven decision making in dairy farming. Journal of Dairy Science, 102(7), 6021-6032.