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ML Based Presaging Technique for Efficient Rooted Cloud Service Provider

[1]Dr.Gayatri Bachhav, [2]Mr Prasad Pandurang Joshi , [3]Mr Sanjyot Sanjit Dharankar , [4]Miss Vidhita Arun Sabale.

[1]Asso.Professor, [1]VPPCOE & VA, Sion,[2,3,4] UG Student ,[2,3,4] Computer Engg. Dept. Shivajirao S. Jondhle College of Engineering & Technology, Asangaon, Maharashtra, India.

[1]krishngita123@gmail.com, [2]prasadjoshi1101@gmail.com, [3]sanjyotdharankar20@gmail.com, [4]vsabale728@gmail.

Abstract - Cloud computing has evolved into an indispensable tool for managing the increasing number of users and the data they create. The growing data rate places pressure on cloud service providers to satisfy customer needs, resulting in the emergence of various service providers. Nonetheless, selecting the best service remains difficult. Researchers have devised a pattern-based service negotiation mechanism to overcome this issue. This technique contains an enhanced recommendation function that gives users with patterns from their previous entries to assist them in making the current choice. A method of implicit tracking is utilized to keep a list of user-accessed services that may be used as a recommendation. Using machine learning algorithms, the services are rated based on user behavior and data observation, and the ranked list is presented to the user for choosing. Using machine learning techniques, this method not only enhances the performance of cloud environment, but also lessens the strain on the service provider [1].

Keywords- Cloud services, Cloud computing, Pattern-based recognition, Machine learning, Utility pattern, K nearest neighbor algorithm.

I. INTRODUCTION

The expansion of cloud computing has transformed how businesses manage their data and satisfy customer requests. As data generation increases, cloud service provider have the problem of handling the additional burden. To address this challenge, scholars have introduced a pattern-based service negotiation approach that utilizes ml algorithms to aid customers in selecting the most appropriate cloud services[1][4].The suggested system employs an enhanced suggestion function that delivers suggestions based on the patterns of services that users have previously accessed. The algorithm for machine learning evaluates the utility patterns of several users and presents consumers with a list of services ranked according to their activity. This method decreases the service provider's workload while recommending services and it enhances the cloud environment's performance [3]. Because of its user-friendly terms and conditions, cloud computing has replacing conventional third-party service providers. Yet, cloud service delivery is still a complicated process involving several technology upgrades and processes. This issue is addressed by the suggested system, which processes client requests through a cloud controller that holds the cloud service. services and resources that are offered by a cloud service provider, including software-as-a-service, platform-oriented services, and infrastructure services. It also mentions that the cloud service supplier provides a wide range of resources and services, including infrastructure services, platform-oriented services, saas [3].

The selection of these services is governed by service level agreements, but in a loosely connected environment such as the cloud, it is difficult to negotiate modifications to the user's decision. The suggested system evaluates the established multi-user utility pattern and offers users a selection of options based on the pattern analysis [3]. This assists users in making wise choices and lessens the chance of further discussions with the service provider.

The suggested approach has potential to assist both customers and service providers by offering a more efficient and user-friendly method for selecting cloud services.

II. AIMS AND OBJECTIVE

a) Aim

The objective is to choose a better cloud computing server that is less expensive, has the best performance, and stores a

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large amount of data with security Nonetheless, it can be challenging to locate a cloud platform that offers all the components of an ideal cloud server [4]. As a result, the services and other conditions outlined in service agreement must be considered when providing services to the user. This system's principal objective is to improve the user's option selection while decreasing the possibility of future negotiations between a user and the service provider.

b) Objective

• This project's principal objective is to give the best cloud server provider depending on the customer's demands while minimizing further agreements between a user and the service provide.

• This study employ an algorithm for machine learning that can address classification and regression issues.

• Study utilize the K-nearest neighbour technique, which falls under the supervision machine learning algorithm category. This is easy to use.

• The machine learning-based prediction approach for cross utility trend Root-level cloud service agreement formation is more effective than the log-based approach in terms of providing effective service .

III. LITERATURE SURVEY

Paper 1: A framework for ranking of cloud computing services:

Customers of cloud services can assess and rate the services based on how well they confirm to QoS standards. This system assesses service quality, ranks them, and provides valuable feedback to clients while promoting healthy competition among cloud service providers. This approach has potential to significantly impact and motivate cloud service providers to improve their Quality of Service and Service Level Agreements, allowing customers to make effective decisions based on their QoS needs. It addresses the critical issue of selecting the right cloud services and empowers customers to make effective decisions based on their QoS requirements

Overall, this approach can improve the transparency, efficiency, and quality of cloud services, benefiting all stakeholders involved [7].

Paper 2: Towards a trust management system for cloud computing:

Cloud computing has become an attractive option for businesses due to its ability to offer cost-effective, scalable, and shared services. Typically, cloud service providers assure their customers of the quality of their services by specifying technical and functional details in Service Level Agreements (SLAs). However, SLAs vary among different providers, even though the services they offer may have similar functionalities. This variation makes it difficult for customers to identify trustworthy cloud providers based on SLAs alone. The study suggests a Trust Management system that takes a multifaceted approach to address the trust issue in a cloud computing marketplace.This architecture enables customers to identify trustworthy cloud providers based on various attributes, such as security, performance, and compliance, which are evaluated by multiple sources and sources of trust information [8].

Paper 3: CLOUDQUAL: Quality model of the cloud services:

The integration of cloud computing with Internet of Things is crucial considering the fact that the cloud is anticipated to manage a huge number of interactions with varying quality requirements.To gain a competitive advantage, cloud service providers must offer services that exceed customer expectations. A quality model is required to express, assess, and contrast the Qos provider so as to accomplish this and create a common understanding. among stakeholders. The cloudqual method basically for cloud services, which incorporates six quality attributes, is presented in this study. availability and usability Consistency responsiveness, security, and flexibility. Usability is a subjective characteristic, while the other factors are objective. Case examples on different storage clouds are used to show how successful cloudqual is standard criteria validate the accuracy of CLOUDQUAL, demonstrating its ability to effectively differentiate service quality[6].

Paper 4:SelCSP : the framework to facilitate selection of cloud service provider :

It highlights the challenge that customers face in selecting an appropriate service provider to ensure guaranteed service quality due to varying service level agreements (SLAs) among providers. The SelCSP framework introduces a mechanism that integrates reliability and competence to evaluate the interaction risk. Trustworthiness is evaluated based on personal experiences or feedback, while competence is measured by assessing the provider's SLA guarantees transparency. To demonstrate the SelCSP framework's application, a case study is presented, and experimental results confirm the practicality of the proposed estimation mechanism. [5].

IV. EXISTING SYSTEM

The proposed improvement aims to enhance the user's selection system and mitigate negotiation issues, although it acknowledges that complete elimination of such issues may not be feasible once negotiations with service providers begin. The SelCSP framework was introduced to simplify the process of selecting the best cloud service provider by providing users with valuable information on service providers, including services offered, pricing, and user feedback. This framework assists users in selecting a provider that meets their needs, although it does not provide a specific algorithm or method to entirely eliminate

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difficulties in choosing a superior service provider. system is effective in enabling informed decisions.

V. COMPARATIVE STUDY

Table 5.1 Comparative Analysis of Existing System

Sr. No	Paper Name	Author/ Publication	Technology	Advantage
1.	SelCSP: Framework to facilitate selection of a cloud service providers.	Ghosh N., Ghosh S.K. and Das S.K., IEEE 2015	ML	It provides a framework that makes it easier for users to choose the most suitable cloud service provider for their needs.
2.	CLOUDQUAL: a quality model for cloud services	Zheng, X., Martin P., Brohman K/ IEEE,2014	ML	It provides dependability, responsiveness, security, and flexibility.
3.	Framework for ranking of cloud services	Versteeg S. and Buyya R, Future Gener / Elsevier,2013	ML	It is designed to improve the user's choosing process and lessen negotiating issues, but cannot eliminate them entirely once the labour between the user and service provider commences.
4.	Towards a trust management system for cloud computing	Habib, S. Ries, M. Muhlhauser / IEEE,2011	ML	The text proposes a Trust Management system to help customers identify trustworthy cloud providers based on Service Level Agreements.

Explanation:

In the paper "CLOUDQUAL: a quality model for cloud services," the authors suggest a quality model to assess and enhance the quality of cloud services across five dimensions.

In SelCSP paper we are studied that the authors has introduce a framework that enables organizations to select cloud service

Provider based on their particular needs and preferences.

"A framework for ranking of cloud computing services" presents a ranking framework that evaluates cloud computing services based on several attributes. service providers, potentially revolutionizing the way users manage their cloud services

VI. PROBLEM STATEMENT

This study has found that the current system faces several issues for cloud service selection and negotiation .The user is not informed of the pace of service completion, and the service selection process is inferior to other available techniques in terms of latency and throughput. Additionally, incomplete learning of service properties and their status can hamper negotiations with the user. Even after negotiation, the service does not provide a significant improvement in throughput. In response to these issues, the study proposes a new service negotiation strategy that ranks services according to the frequency of access affected by the service completion problem. This approach aims to enhance the quality of cloud services by providing users with a more effective method of service selection and rating. By addressing these critical issues, the proposed strategy has the capacity to enhance the performance and reliability of cloud services.

VII. PROPOSED SYSTEM

The proposed work describes a system that helps users select the best cloud service provider for their specific needs and eliminates the need for future negotiations regarding the services provided and other contractual terms. The system employs a ml algorithm to classify cloud service providers based on a multi-user utility pattern. The user unessential to acquire the logbook, as the algorithm takes care of this and provides a final recommendation based on an analysis of all the log inputs. The system aims to make the selection of cloud providers more user-friendly and accessible by using a ml algorithm to consider factors such as performance, cost, security, and scalability. This saves users time and effort while ensuring high-quality service. It also enables users to compare different providers and make informed decisions, making it a significant improvement in the efficiency and effectiveness of cloud service provider selection and management.

VIII. ALGORITHM

1.Initialize with data loading

import numpy

import pandas

pd.read_csv

2. Declare k with the selected quantity of neighbors

3.Determine the distance between a query example and the current example based on the data:The Euclidean distance formula can be used To compute the distance between two points p and q in n-dimensional space:

d(p, q) = sqrt((p1 - q1)^2 + (p2 - q2)^2 + ... + (pn - qn)^2)

where p1, p2, ..., pn are the coordinates of point p, and q1, q2, ..., qn these are the coordinates of q.

4.Sort and and matching the data

```
def _fuzzy_matching(self, hashmap, cloud):
    match_tuple = []
```

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```
# get match
for servicename, idx in hashmap.items():
ratio = fuzz.ratio(servicename.lower(), cloud.lower())
if ratio >= 60:
match_tuple.append((servicename, idx, ratio )
match_tuple = sorted(match_tuple, key = lambda x:
x[2])[::-1]
```

5.If regression, provide mean of K label:For regression problems, the predicted label y for a query example can be calculated as the mean of the labels of its k-nearest neighbors:

y = (y1 + y2 + ... + yk) / k

Where y1, y2….. yk are the labels of the k-nearest neighbors.

6 .If categorization, provide the mode of K label:For classification problems, the predicted label y for a query example can be calculated as the mode (most common value) of the labels of its k-nearest neighbors:

y = mode(y1, y2, ..., yk)

where y1, y2, ..., yk are the labels of the k-nearest neighbors.

IX. MATHEMATICAL MODEL

The K-NN technique is a plain and simple instance-based learning approach that can be used for regression and classification applications. k-NN assigns a new point to the class or label that is most frequently represented among its k-NN in training data[1][4].

Define the distance metric: The distance metric used To compute the distance between test point and the training data points is typically Euclidean distance. The Euclidean distance between points P1(x1, y1) and P2(x2, y2) is given by:

d(P1, P2) = sqrt((x2 - x1)^2 + (y2 - y1)^2)

Assign a class label: Once the K nearest neighbors have been identified, the class label of the test point is assigned based on the majority class of its K-nn. If there is a tie, the class label is assigned randomly.

$D = \sqrt{(x1 - x2)^2 + (y1 - y2)^2}$

Manhattan distance

d = |x1 - x2| + |y1 - y2| + ... + |z1 - z2|

, or Minkowski distance.

d = (|x1 - x2|^p + |y1 - y2|^p + ... + |z1 - z2|^p)^(1/p)

The choice of distance metric can have a substantial effect on the effectiveness of the k-NN algorithm, thus it is essential to select a distance metric that is acceptable for your data and purpose.

In essence, the k-NN algorithm's mathematical approach is to assign a new data point to the class or label that is most frequently represented among their k-NN the training data, depending on a selected distance measure [3].

X. SYSTEM ARCHITECTURE

1.To start with, ML algorithms can be employed in the first step to automate user credential verification and detect potential security threats or anomalies in the system. This method ensures that only the authorized users can access a services and that system remains protected from cyberattacks.

2.In the second step, ML techniques can be utilized to classify and organize data and anticipate future service needs. For example, machine learning models can be trained on data patterns to make predictions about the types of services that will be in demand in the future.

3.In the third and final step, ML-based cloud services can be deployed to provide efficient and effective services to end-users. This can involve leveraging ML algorithms to optimize resource allocation, automatically scale services based on demand, and enhance service availability and reliability.

Taken together, application of ML techniques and technologies to this system architecture can enable the development of a more efficient and effective cloud service provider that delivers superior ML-based services to its users. [4]

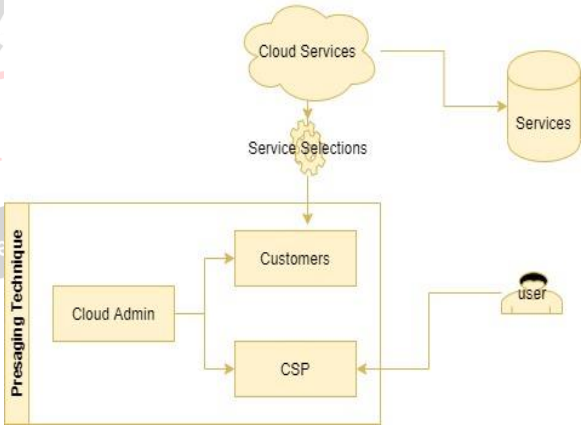

Fig.10.1: The System Architecture

XI. ADVANTAGES

1.The algorithm used in this proposed technique can be an algorithm for machine learning that can address classification and regression issues.
2.Decreased likelihood of further negotiations with the user.
3. Effective log-based prediction system.
4.More accuracy and precision with effective cloud service recommendation.
5.Less computational capabilities or resources.
6.With less data, more precision can be obtained.

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7.The proposed system can save time and effort for users by automating the process of selecting the best cloud service provider for their needs.
8.The use of a multi-user utility pattern allows for personalized recommendations based on each user's individual needs.
9.System adjust to user feedback to improve advice.

XII. DESIGN DETAILS

Fig 12.1: Result

To improve an efficiency of csp system, project focus to progress a machine learning-based technique that can predict future demand for cloud services and optimize resource allocation. This will involve implementing machine learning models that can analyze different data sources, including user logs, network traffic, and resource utilization metrics, to predict future demand for cloud services.

Once the demand for cloud services is predicted, the machine learning models can optimize resource allocation accordingly. This could involve automatically scaling cloud services uneven based on predicted demand, or reallocating resources between different services based on user requirements [4].

Fig 12.2: Analysis and output

Name	Suggestion	Service name	Distance	Time
Prasad	Google App Engine	Microsoft Azure	0.49675	12-3-23 1 pm
Vidhita	Google App Engine	Salesforce	0.49682	13-3-23 5 pm
Sanjyot	Google App Engine	Cisco Metacloud	0.43696	20-3-23 5 pm
Mrunali	Microsoft Azure	Aws	0.34961	10-4-23 7 pm
Aditya	Google App Engine	Cisco Metacloud	0.38951	10-4-23 7 pm

The outcome of this project would be an ML-based presaging technique that enables cloud service providers to offer more efficient and effective services to their users. By forecasting future demand and optimizing resource allocation, the cloud service provider can reduce wastage, decrease costs, and upgrade the quality of service delivery. Furthermore, the ML models can provide valuable insights into user behavior and preferences, which can aid in providing personalized and customized services to users[1][2].

XIII. CONCLUSION

Thus we have tried to implement the paper “Machine Learning based Presaging Technique for Multi-user Utility Pattern Rooted Cloud Service Negotiation for Providing Efficient Service ” by Ayngaran Krishnamurhty ,Bhavan Kumar , IEEE-2020 and conclusion is as follows: The paper proposes a novel machine learning-based approach to improve the performance of cloud service providers. This approach can provide benefits to cloud service consumers and help organizations in selecting better cloud service providers, leading to improved efficiency and effectiveness in their cloud-based operations. However, the effectiveness and accuracy of this approach need to be validated through further empirical testing. Moreover, it may require substantial data processing and computational resources, which could be a challenge for some organizations. Future research can concentrate on enhancing and refining this approach and investigating the potential applications of machine learning in other areas of cloud computing, such as security and privacy.

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