IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Special Issue 2, March 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

| International Conference on Recent Innovations in Engineering and Technology (ICRIET'23)|

| Sharadchandra Pawar College of Engineering, Pune, India |

|| Volume 11, Special Issue 2, March 2023 ||

Advance E-commerce Recommendation Systems using Serverless Computing

Vikram Suryawanshi, Saurabh Tohake, Rajesh Pathare, Shubham Gangarde, R.C.Dumbre

Student, Dept. of C.S., SPCOE, Savitribai Phule Pune University, Pune, India

Student, Dept. of C.S., SPCOE, Savitribai Phule Pune University, Pune, India

Student, Dept. of C.S., SPCOE, Savitribai Phule Pune University, Pune, India

Student, Dept. of C.S., SPCOE, Savitribai Phule Pune University, Pune, India

Assistant Professor, Dept. of C.S., SPCOE, Savitribai Phule Pune University, Pune, India

ABSTRACT: E-commerce recommendation systems have become an essential component of online shopping experiences, providing personalized and relevant product recommendations to users. However, these systems often face challenges related to performance, scalability, and cost-effectiveness, especially when processing large volumes of customer data.Serverless computing has emerged as a popular cloud computing model for developing and deploying applications, as it eliminates the need for server management. Given its benefits, it presents a promising opportunity for enhancing e-commerce recommendation systems. In this paper, we explore the opportunities and challenges of using serverless computing on the cloud to enhance e-commerce recommendation systems. We discuss how serverless computing can enable real-time processing of customer data, facilitate the integration of machine learning and other advanced algorithms, and provide cost-effective and scalable solutions for e-commerce businesses. We also examine the challenges associated with serverless computing, including data privacy and security, resource allocation optimization, and vendor lock-in. Finally, we provide recommendations for e-commerce businesses looking to leverage serverless computing to improve their recommendation systems. Our research contributes to the growing body of literature on cloud computing and e-commerce, highlighting the potential of serverless computing as a game-changer for recommendation systems in the e-commerce industry.

KEYWORDS: Recommendation system,Cloud Computing, AWS, Serverless Architecture.

I. INTRODUCTION

E-commerce has become an integral part of modern-day shoppingand e-commerce recommendation system have emerged as a crucial tool for enhancing customer experiences. These System leverage machine learning and data analytics to provide personalized and relevant product recommendation to users,improving the like hood a purchase and increasing customer loyalty. However,as the volume of customer data grows, traditional e-commerce recommendation systems facechallenges related to performance, scalability and cost effectiveness. Serverless computing is a new paradigm in cloud computing that has gained popularity due to its ability to enable developers to build and run application without having to manage servers. This approach allows developers to focus on writing code and eliminate the need for infrastructure management,making it an attractive option for improving e-commerce recommendation systems. Serverless computing provides a highly scalable, cost-effective, and flexible solution that can facilitate the integration of advances algorithms and deep learning into recommendation system. However, while serverless computing offers many potential benefits, it also presents new challenges, such as ensuring data privacy and security, optimizing resource allocation, and managing vendor lock-in [1].

In this paper, we will examine thepotential benefits and obstacle associated with utilizing serverless computing to improve recommendation system in e-commerce. We examine the benefits and obstacles associated with utilizing serverless computing to improve recommendation system in e-commerce. We examine the benefits of serverless computing, including real-time processing of customer data, improved scalability, and cost-effectiveness. We also explore the potential risks and challenge of using serverless computing and provide recommendation for business look to leverage this technology to improve their e-commerce recommendation systems. This research to the growing body of literature on cloud computing and e-commerce, highlighting.This paper is based as follows: first, we offer historical past data the opportunities and benefits of using serverless computing for e-commerce recommendation systems,

followed by a discussionof the challenges and risk of this approach. Finally, we provide recommendation for e-commerce businesses looking to leverage serverless computing to improve their recommendation systems [2].

II. RELATED WORK

In [3] this system we can used the different types of methodologies i)Cloud computing(Aws)it is nothing but amazon web service it provides various types of services like data security, data storage and also improve the faster data accessing.ii)Serverless Architecture is the backbone of this system because it provides the way to build application without manage the infrastructure.You have no longer to provision, scale and maintain your application, database and storage systemits retransmission time will be less. Using AWS Lambda, Amazon API Gateway and other services to create serverless architecture. Iii) JSON Dataset is used in this system to store and transport data. JSON is used when data is sent from server to web page for this purpose, we can used this. iv) VPC security Configuring built-in virtual firewalls such as Security Groups and Network ACLs lets you lock down your network and protect against unauthorized access to your resources.A VPC allows you to secure your virtual networking environment, including your IP addresses, subnets and network gateways.API Gateway allows you to map multiple sub-domains to a single API endpoint allowing you to white-label the domains based on an external customer's requirement. API request /response transformation: API Gateway allows you to specify the integration of each path of the API endpoint separately.

[4]i) Create project directory.ii)install Python Programming and IDE. Create virtual Environment and PHP dependency. iii) Install Django MVT farmwork, Install AWS Cli. Install serverless environment. vii) Install postgres SQL dataset and PGAdmin. v) Write requirement and time tracing files.Install requirement files. vi) connect postgres database and RDS VS Django MVT vii) Test installation and Connection. viii) Create models, app, create route and setting configuration.ix)) Import required libraries, write class and functions, implement logic and coding into class and required function. x) Run and test application testing, fixing bug and retest.xi)Deploy application using CI/CD.

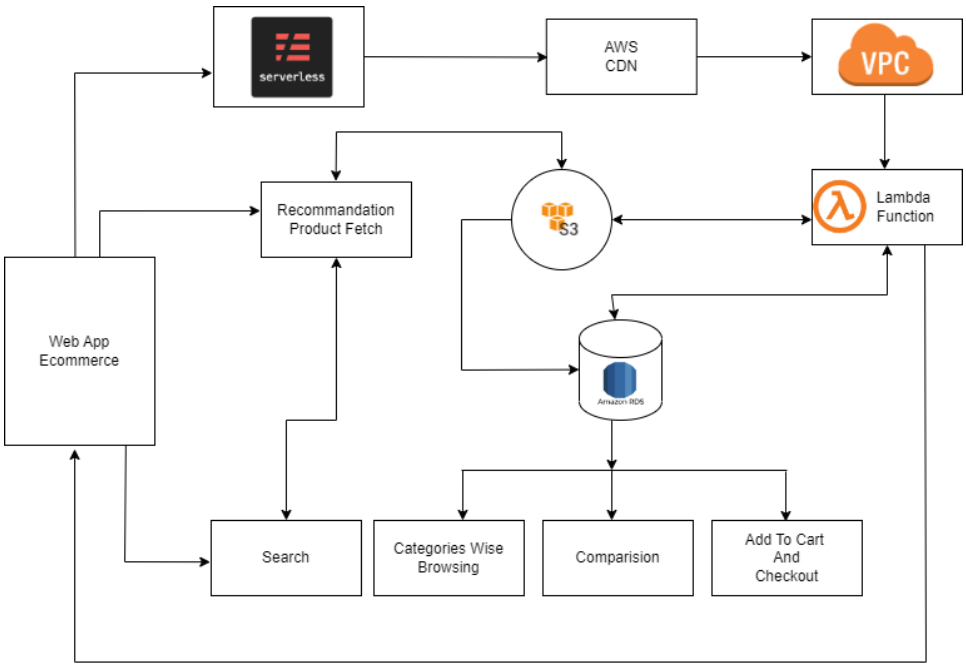

Fig 1. Proposed Architecture of system

III.PROPOSED ALGORITHM

Description of the Proposed Algorithm:

- Divide and Conquer: Divide the problem into a number of subproblems that are smaller instances of the same problem. Conquer the subproblems by solving them recursively. If they are small enough, solve the subproblems as base cases. By using this strategy, we categorized the list of all items in the system.
- K-Nearest Neighbors:K-Nearest Neighbour is one of the simplest Machine Learning algorithms based on Supervised Learning technique-NN algorithm assumes the similarity between the new case/data and available cases and put the new case into the category that is most similar to the available categories-NN algorithm stores all the available data and classifies a new data point based on the similarity. This means when new data appears then it can be easily classified into a well suite category by using K- NN algorithm.By using thisalgorithm, we can categorise the items and also giving recommendation to the user.
- CNN(Convolutional Neural Network): Convolutional Network is the part of deep learning and used to specify theimage recognition and processing of pixel data.The convolutional Neural Network CNN works by getting an image, designating it some weightage based on the different objects of the image, and then distinguishing them from each other.

III.PSEUDO CODE

Step1: electronics_data=pd.read_csv("C:/Users/mukhu/OneDrive/Desktop/New folder/Dataset.csv",names=['userId', 'productId','Rating', 'timestamp'])
Step 2:electronics_data. head()
electronics_data. shape
electronics data=electronics_data. iloc[:1048576,0:]
electronics_data. Dtypes
electronics_data.info()
Step 3: electronics_data.describe()['Rating'].T
print('Minimum rating is: %d' %(electronics_data.Rating.min()))
print('Maximum rating is: %d' %(electronics_data.Rating.max()))
print('Number of missing values across columns: \n',electronics_data.isnull().sum())
with sns.axes_style('white'):
g = sns.factorplot("Rating", data=electronics_data, aspect=2.0,kind='count')
g.set_ylabels("Total number of ratings")
print("The above bar chart represents the distribution of ratings by user. From the chart, the highest proprotion of user rated the products 5.0 while the lowest number of users rated the products 2.0")

Step 4:correlation_matrix = np.corrcoef(decomposed_matrix) correlation_matrix.shape X.index[75] i = "B00000K135" product_names = list(X.index) product_ID = product_names.index(i) product_ID correlation_product_ID = correlation_matrix[product_ID] correlation_product_ID.shape Recommend = list(X.index[correlation_product_ID > 0.65]) # Removes the item already bought by the customer Recommend.remove(i) Recommend[0:24] print("The output above represents the recommended products to the user") Recommend = list(X.index[correlation_product_ID > 0.65]) (i) Recommend[0:24]

IV.SIMULATION RESULTS

In this system we see that the recommendation gets scalable and they give proper recommendation to the customer and also store all the info of customer that they have search on to the system which store safely. Performance of system is good due to the serverless architecture and also give better result during the searching time get less time take place and also threat will remove in this system. The system will give better result during even if the data is large.

.

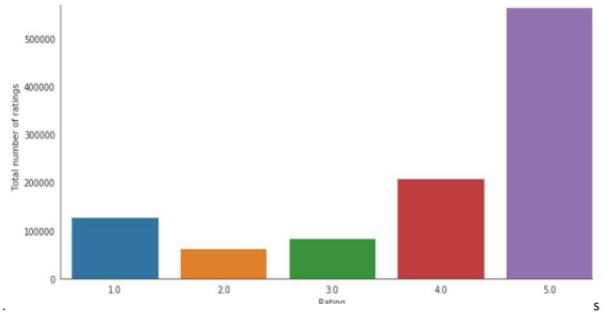

Fig no. Rating result

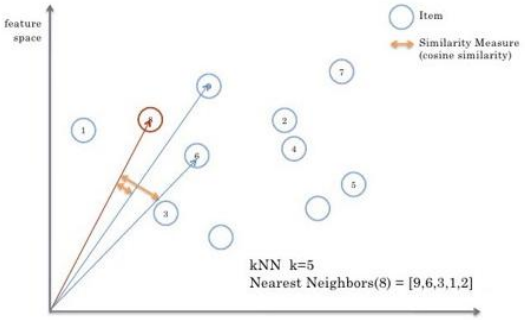

Fig no.K-nearest Neighbor

V.CONCLUSION AND FUTURE WORK

In this paper we study about the challenges and issues are present in the existing system that has been resolve and also improve the performance of the system. This system is based on the serverless architecture so the system will work fast and improve the scalability in the system**.**The research project demonstrates the feasibility and potential benefits of using serverless computing for e-commerce recommendation systems. The implementation of the system shows that serverless computing can enable real-time processing, scalability and cost-effectiveness, while also allowing business to experiment with new algorithms and techniques. The research project highlights the potential impact of serverless computing on the e-commerce industry, including the potential democratization of technology, the development of highly personalized recommendation systems, and the potential for innovation and new applications.

The ethical implications of using serverless computing for recommendation systems should be carefully considered and addressed in future research and development. This includes issues related to data privacy, bias, and transparency. Further research is needed to explore the scalability, cost-effectiveness, and performance of serverless computing for e-commerce recommendation systems. This can help identify potential areas for improvement, and guide the development of news and improved recommendation system in the future. Overall, the research project demonstrates the potential of serverless computing to revolutionary e-commerce recommendation systems, and to drive innovation and competitiveness on the e-commerce industry. By using real time processing. Advanced algorithm and recommendation to customers, while also reducing costs and improving efficiency.

REFERENCES

1. Chen, Y., Xiong, H., & Yu, P. S. (2020). A survey of applications and research opportunities in recommendation systems. Journal of Big Data, 7(1), 1-28.
2. Krylovskiy, S., & Krasnova, H. (2021). How Can AI-based Personalization Be Aligned with User Privacy Needs? An Analysis of User Trust and Acceptance. In Proceedings of the 54th Hawaii International Conference on System Sciences.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

| International Conference on Recent Innovations in Engineering and Technology (ICRIET'23)|

| Sharadchandra Pawar College of Engineering, Pune, India |

|| Volume 11, Special Issue 2, March 2023 ||

3. Li, Z., Li, H., Zhang, L., & Li, X. (2019). Performance evaluation of cloud computing service providers for scientific computing. Journal of Cloud Computing, 8(1), 1-19.
4. Sharma, V., Bhattacharya, S., & Singh, V. (2020). A review on serverless computing: Architecture, platforms, and applications. Journal of Grid Computing, 18(2), 267-303.
5. Singh, A., & Jain, N. (2019). Serverless computing: A review, comparison, and research agenda. Journal of Cloud Computing, 8(1), 1-25.
6. Wang, J., Lin, J., & Wu, Y. (2021). A systematic literature review of cloud computing research in healthcare. Journal of Medical Systems, 45(3), 1-17.
7. Bauer E. Improving Operational Efficiency of Applications via Cloud Computing. IEEE Cloud Computing.
8. Chang Xueqin. Research on e-commerce logistics distribution model based on cloud computing. Logistics Technology.
9. Liu Mingyue. About the services of big data and cloud computing for e-commerce. Information and Computer (Theory Edition).
10. R.C. Dumbre.,M.D.Rokade, An Efficient Approach to Detection of Software and Network Attack using Forensic Investigation for Vulnerable Environment, DOI:10.15680/IJMRSET.2021.0407023, Volume 4, Issue 7, July 2021.
11. R.C. Dumbre.,M.D.Rokade, Forensic Investigation and Evaluation of Network Attacks using Machine Learning Techniques Cloud: An Overview, DOI: 10.15680/IJIRCCE.2021.0907007, Volume 9, Issue 7, July 2021.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details