THE SMART DATABASE ADMINISTRATION AND ACCESS CONTROL MODEL FOR BIG DATA AUTOMATION MANAGEMENT IN ULTRA DENSE CLOUD SERVER

J Logeshwaran[1] and Karthick Selvaraj[2]

[1]*Department of Electronics and Communication Engineering, Sri Eshwar College of Engineering, India*
[2]*Wipro Technologies, India*

Abstract

Currently, the various functions of organizations cannot be performed without an information system, which allows automatic data collection and processing. To store and access the data containing the required information, a database is created. The purpose of any information system is to process data from a collection of real world data. In the broadest sense, a database is a collection of information on specific objects of the real world in any case. Under the subject area, it is customary to understand a part of the real world to organize management and automation. In this paper, the database administration and access control model for big data automation management was proposed in ultra dense cloud server. The proposed model reached the 94.10% of server management, 94.10% of big data management, 95.10% of database management, 92.14% of storage management and 92.19% of external memory management At a time when massive amounts of data are pouring in from numerous channels, their sequencing is more relevant than ever. Modern information systems based on the concept of data integration require that the stored data, a complex system, meet the diverse needs of many users.

Keywords:

Information, Data, Collection, Processing, Database, Objects, Administration, Access, Big-Data

1. INTRODUCTION

The proliferation of digital channels and proliferation of data has been asking many questions for years [1]. Data Management Platforms (DMP), which paved the way for audience segmentation by planning data from different channels – websites, mobile apps, connected objects, social networks, stores, forms, etc. [2]. Now that their deployment and use has become commonplace for about two years, it is time to take stock. A data management platform is a tool for collecting and managing user data [3]. It collects data from various channels and analyzes it and organizes it into groups and sub-groups. But that not all, because a DMP is capable of integrating data in different formats: tabular information, customer journey, digital, texts, etc., including when this information is anonymous [4]. All of this data draws on customer profiles and distributes them in the most relevant way possible across similar groups [5]. Finally, these groups are targeted by marketing or CRM campaigns that take into account the details gathered through data analytics [6].

Database is an information model in the form of a collection of data stored in the computer memory and related to the rules that determine the general principles of interpretation, storage and manipulation [7-8]. The information model understands the information about the object, selected and structured by the chosen target [9]. The description of data and data processing

methods in a database Methods of determining the types of logical structures in a database, including methods of determining the types of database structures, methods of determining the integrity of the database [10] The first databases were created based on file systems, and all responsibility for working with them was imposed on the application software that used these platforms. File databases are no longer used in practice [11].

In modern database technology, it is assumed that the creation of a database, its support and user access are carried out centrally with the help of specialized software tools. A database management system (DBMS) is a complex of language and software designed to help users create, maintain, and use a database [12]. Modern database servers include all kinds of developments and mechanisms for interacting with the user at a higher level. These development tools allow you to create applications that work as DBMSs, as they are user applications [13]. A DBMS is a software package in which many people participate, both serving these programs and using the results of their work [14]. All the treats for building an informative model of a particular subject area of human activity are one to get a good database. Explain the term "good database" and we develop the requirements it must satisfy:

- In structure and content to meet the information needs and possibilities of users (organizations) and solution objectives;
- confirm the received data that requires an acceptable time, I.E., respond to performance requirements;
- To be easily expanded or integrated into larger objects in the reorganization of the subject area;

Database management systems are very important for many companies and organizations that require the security and efficient use of information resources [15]. The efficiency of the company depends on how the management of the document flow is organized. In fact, ineffective use of accumulated information (or worse, its loss) and ineffective use can lead to the collapse of the company [16]. After all, no time, information or document received, first of all, lost money, time and missed opportunities. As a result, in any organization, active work is done with various documents, sooner or later the problem of organization, processing and secure storage of a significant amount of information [17]. Modern electronic document management systems play an important role in improving operations of any size and profile.

2. LITERATURE REVIEW

The author [1] discussed the data is all the actual material stored in the database. Its constituent raw materials are untreated raw materials. It should be noted that modern database servers

often model the "entity-communication" model by modeling or other means of creating data schemas. It is expressed the Metadata refers to system directory content. Represent information about the names and structure of tables, user rights, constraints, and other database objects [2]. In the article [3] procedures are an important component of organization. Establishing standards for maintaining commercial, technical and production and technological activities within the framework of the company and in relations with customers. Author [4] expressed the design of databases, as well as the design of information systems, consists of several stages. One of the most important phases of design is the creation of "essence-communication" diagrams. To do this, you need to manage entities, add properties to them, set keys and connect entities using links. Providing the possibility to create custom databases and inexpensive applications. Individual DBMSs or those designed with their help can often act as the client side of multiplayer DBMs.

3. PROPOSED MODEL

The growth of DMPs is a direct result of the proliferation of data acquisition channels and the exponential increase in data volumes. They are also tools to avoid getting lost in the jungle of client sources: in 55% of cases, DMP is used to identify users using multiple channels – typically, mobile phones should not be targeted, which is shown in Fig.1.
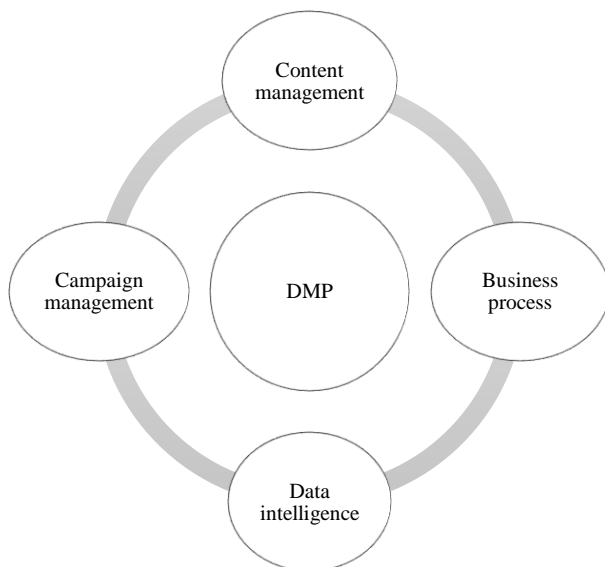

Fig.1. Data Management Process (DMP)

- Content management introduces the management and modification of contact lists obtained through data extraction
- Business process services provides the management of business activities
- Data intelligence accomplished the complete processing of the customer journey
- Campaign management provides the design and planning of campaigns based on data analysis

As we can see, these can be complete tools that not only process and organize data, but also improve their use and impact

both customer experience and business operations. Three types of data are involved:

- First Party: Data, owned by the Advertiser;
- second party: data from marketing campaigns;
- Third-party: data is purchased from companies that specialize in data integration.

The combination of all three types of data gives great power in the field of data marketing, allowing it to trigger relevant, immediate and targeted actions. Not only digital channels, but also traditional channels: phone, mail, SMS, sales in physical stores, benefit from the benefits conveyed by data marketing. In principle, the implementation of a DMP can respond to three different or overlapping problems:

- The company (brand) faces cross-channel customers;
- It gets silos of data;
- He wants to immediately improve the performance of his campaigns.

From these basic requirements, the field of exploitation of DMPs is extensive: integrating customer data, personalizing their experience across the digital ecosystem and all channels (including stores and customer services), organizing a large amount of data, creating competitive advantages, etc. Software includes all the computer programs used in the operation of the database management system. System software (the hardware manages all the components and provides access to all other applications running on the system):

- Software DBMS (manages the database to implement DBMS functions);
- Application programs and applications (designed to access data and manipulate it in an environment, application programs are used to represent the data stored in the database).

However, the research tells us that organizations using DMPs (mostly media publishers, trading desks and media agencies) use them for programmatic ad buying and media optimization. Data collection from web user browsing accounts for 87% of DMP usage, CRM data for 64%. There is still little hindsight to assess their performance on ROI (DMP makes it possible to more precisely control the ROI of marketing budgets). DBM software represents the outflow of intermediate software. The proposed model handling the following 6 groups as in Fig.2:

- *System Administrators* - Ensure responsible and reliable software work
- *System Administrators* - provide the DBMS, manage it, create entries, perform procedures related to the reliability of data storage (rights, limit access).
- *System Analysts* – To work on data structure, applications and reports system
- *Database Designers* – Design DBMS system
- *Programmers* – Develop application software
- End users use application programs to perform daily activities.

However, most of these users may not be aware of the broader impact of DMPs on a company marketing practices. Beyond ROI, a DMP offers the opportunity to strengthen customer

relationships, consolidate a company brand image, and improve customer experience across all channels, including physical ones.
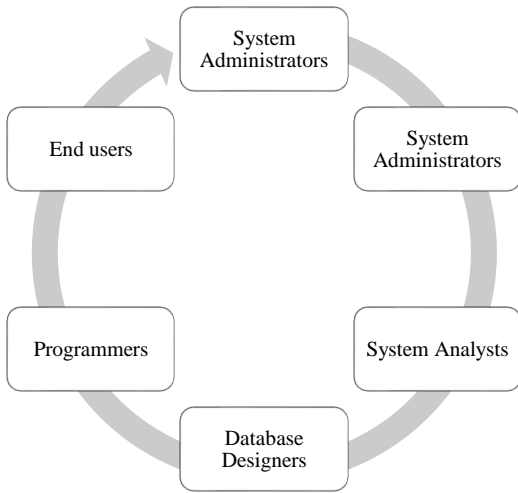

Fig.2. Proposed model functional groups

4. RESULTS AND DISCUSSION

The proposed database administration and access control model (DAACM) was compared with the existing big data algorithm systems (BDAS), Chaos Game Optimization algorithm (CGOA), Big data-driven scheduling optimization algorithm (BDSOA) and data gathering and incident response model (DGIRM)

4.1 SERVER MANAGEMENT

Designed to organize data centers in computer networks. This BD group is currently less numerous, but their numbers are gradually growing. In the role of client programs database servers, in general, various programs can be used. Spreadsheets, word processors, e-mail programs, etc. In this case, the client-server pair components belong to one or different software manufacturers. In the case when the client and server units are performed by a single entity, the distribution of functions between them is expected to be rational. In other cases, the data is usually pursued by the target to access the data "at any cost". The Fig.3 demonstrates the comparison of server management between the existing and proposed model. In a comparison ratio, the proposed DAACM model achieved 94.10% of server management. In the same point the existing BDAS reached 91.79%, CGOA obtained 74.56%, BDSOA achieved 90.55% and DGIRM reached 80.19%. Hence the proposed model achieved better server management while compared with the other existing models.

4.2 BIG DATA MANAGEMENT

Programs of the first and second form are small and are intended mainly for computer programmers. Collections of the third type are much larger, but smaller than fully featured DBMs. Tools for developing user applications include programming systems such as Clipper, various programming libraries for various programming languages, and development automation packages (including client-server type systems). In addition to

listed funds, various additional funds are used to manage data and organize database services.
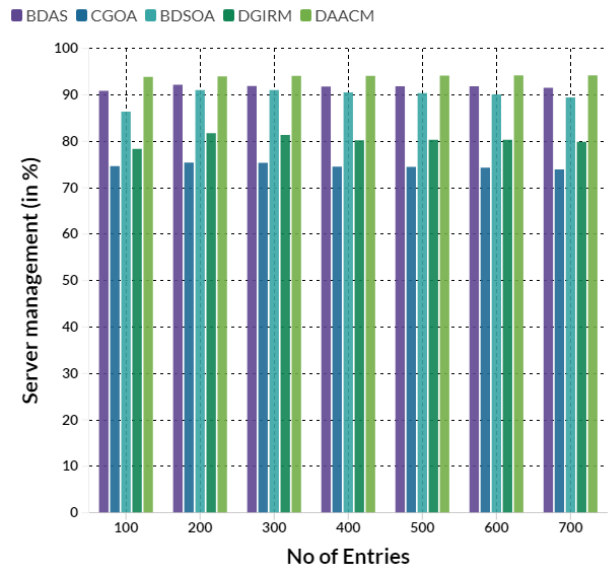

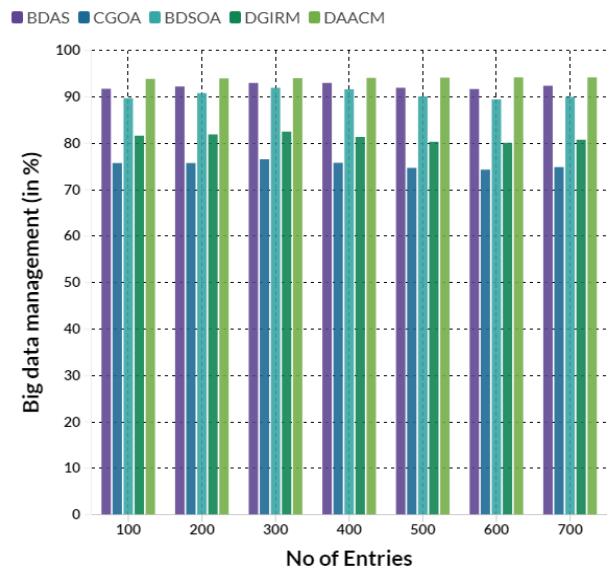Fig.3. Comparison of server management

Fig.4. Comparison of big data management

The Fig.4 demonstrates the comparison of big data management between the existing and proposed model. In a comparison ratio, the proposed DAACM model achieved 94.10% of big data management. In the same point the existing BDAS reached 92.99%, CGOA obtained 75.82%, BDSOA achieved 91.60% and DGIRM reached 81.35%. Hence the proposed model achieved better big data management while compared with the other existing models.

4.3 DATABASE MANAGEMENT

Big data consists of a server and a client part and, as a rule, operates in a unified computing environment (with different types of computer and operating systems). Examples of multiplayer DBMS include Oracle and Information DBMs.

According to the data model used by the DBMS (as well as the database), it is divided into hierarchical, network, relational, object-oriented and other types. Some DBMS can support multiple data models at the same time.
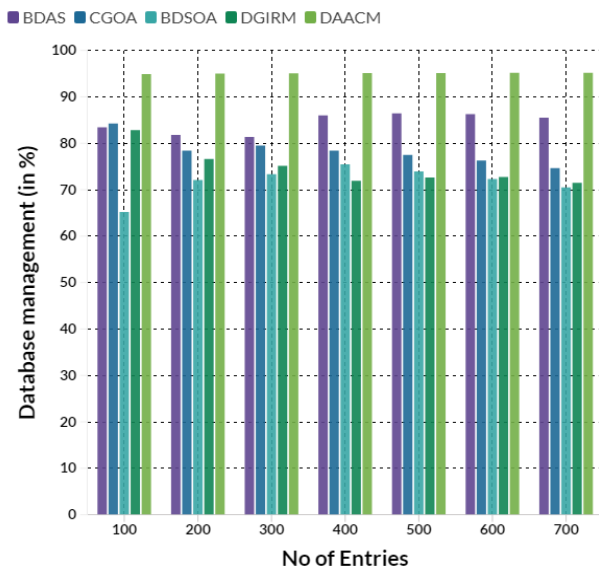

Fig.5. Comparison of database management

The Fig.5 demonstrates the comparison of database management between the existing and proposed model. In a comparison ratio, the proposed DAACM model achieved 95.10% of database management. In the same point the existing BDAS reached 86.03%, CGOA obtained 78.39%, BDSOA achieved 75.49% and DGIRM reached 71.91%. Hence the proposed model achieved better database management while compared with the other existing models.

4.4 STORAGE MANAGEMENT

From the user point of view, the DBMS implements the functions of storage, transformations (filling, editing and deletion) and information processing, as well as developing and retrieving various output documents. The database provides two types of programs and users to work with DBMs stored in the database.

A data description language is a high-level normal declarative type language designed to describe a logical data structure; and the data manipulation language is a set of structures that ensure the implementation of the main operations of working with data: input, transformation and modeling of requests data.

The Fig.6 demonstrates the comparison of storage management between the existing and proposed model. In a comparison ratio, the proposed DAACM model achieved 92.14% of storage management. In the same point the existing BDAS reached 86.30%, CGOA obtained 76.50%, BDSOA achieved 81.80% and DGIRM reached 76.45%. Hence the proposed model achieved better storage management while compared with the other existing models.
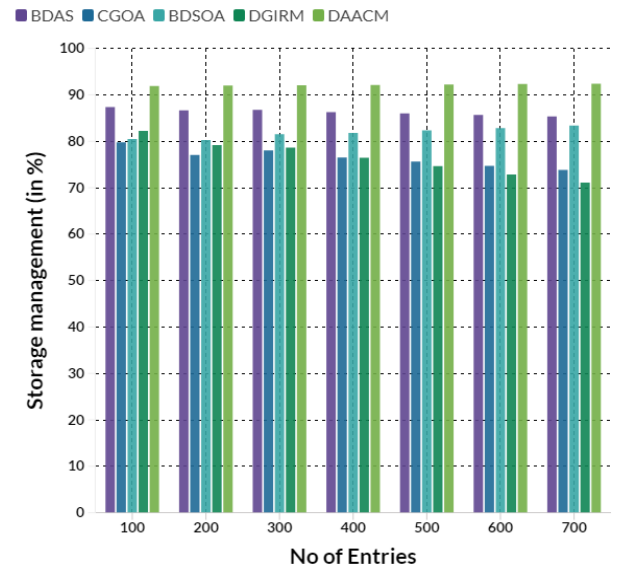

Fig.6. Comparison of storage management

4.5 EXTERNAL MEMORY MANAGEMENT

Data management in external memory to implement the operation in different systems, it varies at the resource management level (using OS file systems or using direct control of PEVM devices), and according to the logic of the data management protocols themselves. Essentially, data management methods and mechanisms are an "internal affair" of DBMs and not directly to the user.

The quality of this operation is very strongly affected, for example, with large databases, with complex requests, a large amount of data processing. A consequent demand for data suspension and implementation of bucket management functions is due to the fact that the size of RAM is smaller than the size of external memory.
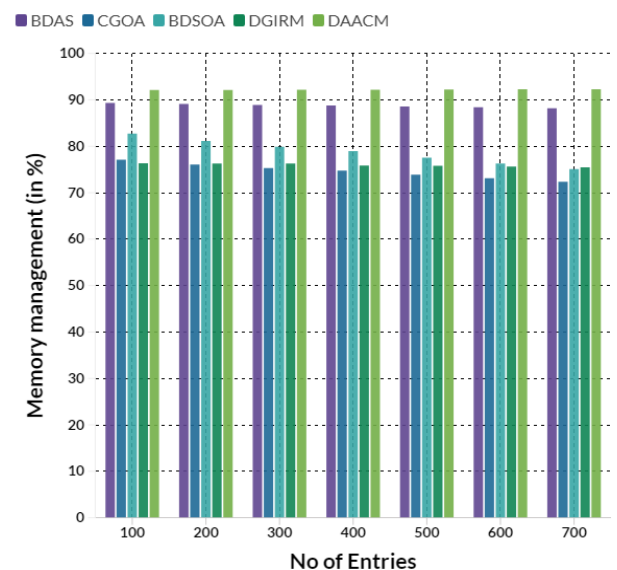

Fig.7. Comparison of external memory management

The Fig.7 demonstrates the comparison of external memory management between the existing and proposed model. In a comparison ratio, the proposed DAACM model achieved 92.19% of external memory management. In the same point the existing BDAS reached 88.81%, CGOA obtained 74.77%, BDSOA achieved 78.97% and DGIRM reached 75.85%. Hence the proposed model achieved better external memory management while compared with the other existing models.

5. CONCLUSION

There is an underestimation of the effectiveness of these tools, which is quite embarrassing because their deployment is expensive and, today is reserved for companies positioned in B2B and B2C markets with significant advertising budgets. DMP is a fundamental cultural revolution that represents the full use of all its potential. But to use it properly, it is necessary to take this into account: DMP is not data marketing, but a tool to reveal it. Strengthen data marketing. Its deployment cannot be done without a temporary data strategy. Either way, data management platforms will dominate by the end of this decade. In a comparison ratio, the proposed model reached the 94.10% of server management, 94.10% of big data management, 95.10% of database management, 92.14% of storage management and 92.19% of external memory management. The file Server DBMS Data files are centered on the file server. The core of DBMs is located on each client computer. Data access is done through the local network. Reads and updates are carried out through synchronous file locks. The advantage of this architecture is the low load on the server CPU, and the disadvantage - high loading of the local network. At this point, the file server DBMS is considered obsolete.

REFERENCES

[1] M. Chen, A. Ludwig and K. Li, "Clustering in Big Data", Available at: https://pdfs.semanticscholar.org/2ab0/d4ded091959f0ed71 40b85c90bef49d9ab1b.pdf, Accessed at 2020.

[2] M. Hajeer and D. Dasgupta, "Handling Big Data using a Data-Aware HDFS and Evolutionary Clustering Technique", *IEEE Transactions on Big Data*, Vol. 76, pp. 1-16, 2017.

[3] A. Elsayed, O. Ismail and M. El-Sharkawi, "MapReduce: State-of-the-Art and Research Directions", *International Journal of Computer and Electrical Engineering*, Vol. 6, No. 1, pp. 34-39, 2014.

[4] R. Loohach and K. Garg, "Effect of Distance on K-means Clustering Algorithm", *International Journal of Computer Applications*, Vol. 5, No. 2, pp. 7-9, 2012.

[5] A. Ali and W. Hamouda, "Advances on Spectrum Sensing for Cognitive Radio Networks: Theory and Applications", *IEEE Communications Surveys and Tutorials*, Vol. 19, No. 2, pp. 1277-1304, 2016.

[6] M. El Tanab and W. Hamouda, "Resource Allocation for Underlay Cognitive Radio Networks: A Survey", *IEEE Communications Surveys and Tutorials*, Vol. 19, No. 2, pp. 1249-1276, 2016.

[7] S. Smys, "Survey on Accuracy of Predictive Big Data Analytics in Healthcare", *Journal of Information Technology*, Vol. 1, No. 2, pp. 77-86, 2019.

[8] A. Gunasekaran and S. Akter, "Big Data and Predictive Analytics for Supply Chain and Organizational Performance", *Journal of Business Research*, Vol. 70, pp. 308-317, 2017.

[9] B. Heller, S. Seetharaman and P. Mahadevan, "ElasticTree: Saving Energy in Data Center Networks", *Proceedings of USENIX Conference on Networked Systems Design and Implementation*, pp. 1-17, 2010

[10] D. Xi and D. Sonbull, "Application of Teaching Administrating Informatization in Universities Based on the Era of Big Data", *Wireless Communications and Mobile Computing*, Vol. 2022, pp. 1-14, 2022.

[11] J. Leng and M. Xu, "A Prediction Model of Recidivism of Specific Populations Based on Big Data", *Wireless Communications and Mobile Computing*, Vol. 2022, pp. 1-15, 2022.

[12] T.P. Kharel and P.R. Owens, "Linking and Sharing Technology: Partnerships for Data Innovations for Management of Agricultural Big Data", *Data*, Vol. 7, No. 2, pp. 1-12, 2022.

[13] A. Ponmalar and V. Dhanakoti, "An Intrusion Detection Approach using Ensemble Support Vector Machine based Chaos Game Optimization Algorithm in Big Data Platform", *Applied Soft Computing*, Vol. 116, pp. 108295-108305, 2022.

[14] C. Niu and L. Wang, "Big Data-Driven Scheduling Optimization Algorithm for Cyber–Physical Systems based on a Cloud Platform", *Computer Communications*, Vol. 181, pp. 173-181, 2022.

[15] F. Motamedi and F. Ghasemi, "Accelerating Big Data Analysis through LASSO-Random Forest Algorithm in QSAR Studies", *Bioinformatics*, Vol. 38, No. 2, pp. 469-475, 2022.

[16] L. Zhang and N. Li, "Material Analysis and Big Data Monitoring of Sports Training Equipment based on Machine Learning Algorithm", *Neural Computing and Applications*, Vol. 34, No. 4, pp. 2749-2763, 2022.

[17] Y. Li and S. Liu, "Discrete Dynamic Modeling Analysis of Data Mining Algorithm under the Background of Big Data in the Strategic Goal of Sustainable Development of College Physical Training", *Wireless Communications and Mobile Computing*, Vol. 2022, pp. 1-13, 2022.