A REVIEW PAPER ON DATABASE MANAGEMENT SYSTEM AND ITS CHALLENGES

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ABSTRACT

Database management systems consider the distribution of data control systems and the power of data, both of which can be attained through risk-free, advantageous program operation. Over time, database technology has seen dramatic changes. Every period has a different set of problems and difficulties for databases. Leaders in business must uphold high service standards in order for their companies to be competitive. In the current business climate, this entails using the best database development software to manage data properly. Expert database development firms provide companies with increased visibility and empower them to make well-informed decisions to enhance their capabilities. This paper describes the database management system and its challenges. Further explain about various research papers, all researchers mainly focus on database challenges for new technology.

Keywords: DBMS, integrity, risk-free, crash recovery

1. INTRODUCTION

The term "database management system," or simply "DBMS," refers to a computerized solution that facilitates the easy reading, editing, deleting, and scaling of information with the main goal of enabling analysis, facilitating correlations, and bolstering data-driven workflows. A computerized system for maintaining data is called a database management system, or DBMS. On such a system, users can perform a variety of operations to modify the data and oversee the database structure.

At first, the data was organized into many file formats. Since DBMS was a novel concept at the time, a lot of research was done to help it overcome the drawbacks of the traditional method of data administration. Database management systems (DBMSs) are categorized using data structures or types. A database management system frequently modifies the data, including its format, field names, record and file structures, and the data itself. It also lays forth rules for modifying and confirming this information. Certain data handling concepts are applied as database management techniques advance.

There are numerous benefits to managing data with a DBMS:

Effective data access: A DBMS stores and retrieves data effectively by employing a number of complex strategies. When data is kept on external storage devices, this capability becomes even more crucial.

Data security and integrity: The DBMS can impose integrity restrictions on the data if it is always accessed via it. For example, the DBMS can verify that the department budget is not exceeded before entering salary information for an employee. Additionally, the DBMS has the ability to enforce access rules, which control which data is visible to which user classes.

Concurrent access and crash recovery: A database management system (DBMS) arranges for users to access data concurrently, giving the impression that only one user is accessing the data at a time. Moreover, users are shielded from the consequences of system failures by the DBMS.

Shorter time needed to design an application: It is obvious that the DBMS provides a wide range of crucial features that are required by many applications that access data kept in the DBMS. This helps with the speedy development of applications, together with the high-level interface to the data. Because the DBMS handles numerous crucial activities rather than the application, these programs are also probably more reliable than those created from scratch.

Principal difficulties in database:

Let's examine some of the main database administration issues that businesses currently deal with in more detail.

Optimal Performance of Databases: It should go without saying that maintaining a business requires a lot of time. Because of this, database management frequently gets neglected, which harms your database's integrity. For businesses that have begun to collect more and more data than ever before, this presents a significant difficulty. This data is occasionally entered into databases that aren't meant to manage it.

Migration to the Cloud: Everything takes place in the cloud these days. Thus, it should come as no surprise that an increasing number of companies are using the cloud for database management and storage. The migration to the cloud has proven to be one of the largest problems in database administration, with 80% of enterprises currently employing a combination of cloud and on-premises database setups.

Transition to New Technologies: The transition to newer technology that is required is an additional obstacle on top of the difficulties associated with cloud migration. Microsoft no longer offers security updates, extended support, or mainstream support for SQL Server 2008. When handling sensitive data that has to be protected, businesses using the database cannot guarantee that it is secure, which is a serious issue.

Adherence: Over 3,800 breaches involving over 4.1 billion records were made public in the first half of 2019. The main reason these databases were vulnerable was because the security standards were long and complicated, making it difficult for users to learn and follow them. Maintaining the security and protection of a company's data storage is essential when it contains information like employee personnel files, customer billing history, sales trends, and financial material, intellectual

2. LITERATURE REVIEW

Christopher McMillen et al. (2024) the researchers offer a thorough analysis of the developments that relational and non-relational databases have seen over the years in database management systems (DBMS). This study intends to provide insights into the current state of database technology and to define future directions for research and development in the field by examining the evolution of DBMS technology, new trends, and the influence of big data and cloud computing.

Toni Taipalus et al. (2023) researchers define database management systems (DBMSs) and examine how well various DBMSs function in an effort to identify the most effective one. This survey offers suggestions for business and research by methodically combining the findings and methodologies of studies comparing DBMS performance. The findings indicate that tests are routinely published in too little information to allow for replication or drawing inferences from the reported results, and that performance is typically assessed in a manner that does not reflect real-world use cases.

Xue Yang et al. (2023) researchers concentrate on the most recent developments and innovations in the use of big data in precision medicine. The main points—content, data sources, technology, tools, obstacles, and gaps in the market—are outlined. We cover nine domains: biomedical imaging informatics, omics data, health monitoring data, knowledge graph, public health informatics, data warehouse and data management, electronic medical record, and artificial intelligence-aided surgical design and optimization.

Tihomir Katulić et al. (2023) The General Data Protection Regulation significantly enhanced the high level of data protection in the researcher's survey. Open data is information that is made available for use for both commercial and non-commercial reasons. Available in an open, machine-readable format to the general population. It is expected that publicly available would promote the (data) economy and data-driven innovations, especially in the IT services sector and SMEs, while also enhancing public sector transparency. The need for open data has been emphasized by the new European data plan for 2020, including for data that is not held by the public sector. This plan calls for leveraging more open data to boost the EU's single market for data.

Prabhu Prasad et al. (2020) researchers claim that, considering the possible effects of these fictitious events, the use of database management solutions has suddenly increased. added that the foundation of database management systems is the advancements achieved through integration. In order to analyze the work, generate improved performance, and organize accreditation, they give vital means of concurrent communication. Effective use of proper programming can increase benefits and incorporate the knowledge that is required to regulate the downward axis of dynamic cuts. The essay offers a wide-ranging viewpoint on the use of databases across numerous industries.

Sindhubala Patel et al. (2023) they talk about the necessary conditions, difficulties, and problems that arise; as a result, several database management systems are being developed and are currently being applied. Since there are several DBMSs available, each has unique features, advantages, and disadvantages. The authors conducted a literature review in order to examine different types of DBMSs, their characteristics, and their attributes. This survey's primary goal is to talk about different database management systems from 1960 to 2022. The literature on several database management systems is presented in-depth in this study. This essay also discusses the benefits and drawbacks of different database management systems.

Shagufta Praveen et al. (2017) the researchers' analysis of the varying demands of each age presents a fresh set of difficulties for databases. Researchers propose various concepts and combos to address those issues. These different pairings improve the database's qualities, which is how the database begins to change over time. They claimed that the database we currently have is completely different from the one we had in 1960. This overview covers the development

of databases from their inception to the present. It also explains how various ideas, theories, and technologies have contributed to the evolution of databases, as winning a game requires more than just one talented player on a team. It is a reality that industries continue to expect an improvement in database technologies.

3. CONCLUSION

Having a clear knowledge of the database paradigm—that is, the range of issues covered by database research—is essential to comprehending current and probably future database advancements. Numerous contemporary issues, especially those confronting internet giants like Google, Facebook, and others, center on circumstances in which three essential components of a database environment are missing. These applications are obviously data-intensive, but they lack a database (the data is not loaded into a database), a database schema (the data is mostly sparse and semi-structured), and database query support (the applications primarily involve text searches over semi-structured data). As a result, it is challenging to consider these apps to be database applications.

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