Effectiveness of Tableau and SQL Software in Analytics in Business Decisions

Janani. S[1], Manoj Kumar. S[2], Akash. S. Bilagi[3] and Prof. Sunetra Chatterjee[4]

[1]MBA, IFIM College, Karnataka, INDIA
[2]MBA, IFIM College, Karnataka, INDIA
[3]MBA, IFIM College, Karnataka, INDIA
[4]Assistant Professor, Department of Computer Applications, IFIM College, Karnataka, INDIA

[1]Corresponding Author: janani.s@ifim.edu.in

ABSTRACT

The ability to raise, manage and examine the data gathered by multiple people around the library is provided by data images to librarians. This article discusses the Ohio State University Libraries' experiences with Tableau, sophisticated information management, and quick analytics solutions. Tableau enables the librarian to combine and make use of data gathered from various sources, as well as deal with logs, Google Analytics, and usage reports for e-resources. In addition to sharing visualization examples, the essay explains the backdrop for including information graphics in The Ohio State University Libraries' assessment program. The benefits of combining and viewing information visualizations from various sources are described and investigated. The paper is ended with a brief discussion of the potential future developments for using Tableau Desktop to visualize library information.

Keywords-- Tableau, Structured Query Language (SQL), Non-SQL (NoSQL), Big Data, Big Data Analytics, Relational Database, SQL Database, NoSQL Database

I. INTRODUCTION

Tableau Software is an American business intelligence company that specializes in interactive data visualization software. It assists in transforming numerical and textual data into visual dashboards that make data easier for people to see and comprehend. Tableau has the wonderful feature of not requiring any technical or programming knowledge to function. Many experts from all fields have developed an interest in it. Tableau products query relational databases, cloud databases, online analytical processing cubes, and spreadsheets to produce graph-style data visualisations. Additionally, an in-memory data engine can have its data extracted, stored, and retrieved by the software. 50 columns are the maximum for Tableau.

Tableau Software Products Include

Tableau Viz able is a mobile app for consumer data visualization that was released in 2015. Other Tableau products include Tableau Desktop, Tableau Server, Tableau Online, Tableau Prep Builder (released in 2018), Tableau Public (free to use), Tableau Reader (free to use), Tableau Mobile, Tableau Cloud, Tableau Prep, and Tableau CRM.

SQL Software is known as Structured Query Language. It is a standardized programming language that is used to interact, communicate, and access databases. SQL is frequently used by database administrators as well as programmers creating scripts for data integration and data analysts setting up and executing analytical queries. It is a programming language with specialized functionality made for handling data stored in relational database management systems (RDBMS) or relational data stream management systems (RDSMS).

Data query, data manipulation (insert, update, and delete), data definition (schema development and change), and data access control are all included in the scope of SQL.

SQL Statements Commands

Data Manipulation Language (DML), Embedded SQL Statements, Session Control Statements, System Control Statements, Data Query Language (DQL), Data Definition Language (DDL), and Data Manipulation Language (DML)

II. LITERATURE REVIEW

The utilization of vast knowledge has increased significantly recently, according to Khedikar. K. A (2021). According to IBM, around 2.5 big integer bytes of knowledge area units are produced daily. These area unit totals will rise dramatically in the future. This information has been a blessing for a company because it indicates that if we tend to extract data from enormous knowledge and utilize it for the prediction of business decisions then it's valuable for each firm and their consumers, huge datasets volume is huge, speed is high, and selection is numerous. Because these datasets are so difficult to work with when using outdated methods, knowledge analytics is crucial to the investigation of the data. Information that uncovers valuable information is required for better decision-making through inspection, refinement, remodelling, and modelling methods. The knowledge analytics method is this one. This essay focuses on several different analytics techniques and equipment.

Murphy, S. A. (2013) asserts that data visualization gives librarians the freedom to raise manage, explore, and gift data gathered by numerous people throughout a library organization. This text discusses The Ohio State University Libraries' experiments with Tableau, posh information visualization, and quick analytics package. By combining and utilizing data from several unrelated sources, such as dealing logs, Google Analytics, and e-resource consumption reports, Tableau enables librarians to do just that. The benefits of mixing and simultaneously viewing visualizations of knowledge from various sources are articulated and explored. The article provides context for incorporating information mental images into the assessment program of the Ohio State University Libraries and shares samples of visualizations created for 2 information analysis comes. The article's conclusion includes a quick discussion of how visualizing library information abuse on Tableau Desktop might develop in the future.

According to Hoelscher, J., & Mortimer, A (2018), this case highlights the significance of nursing analysis data using an information mental image software system to help you understand information and how it can be transformed into information that can improve decision-making, specifically Tableau. According to AACSB principle A7, the case focuses on experience with knowledge mental image software system to "convey knowledge, results, and insights" (AACSB, 2013) and apply higher-order thinking. You may be asked to attach to the Associate in Nursing Access file to investigate six months of sales dealing knowledge of a small low start-up frozen dessert manufacturer. You may be required to perform an Associate in Nursing beta analysis to identify key trends within the knowledge to organize and report that information to support the business decision-making method once you have experience with "the knowledge of the information" and data mental image software system. As a fundamental introduction to knowledge mental image software system, this case is intended to be used in an Associate in Nursing collegian accounting info systems course, an Associate in Nursing introductory social control course, or a course that specializes in knowledge analytics.

Venkatraman et al. (2016) claim that there have been two recent major revolutions in knowledge management, namely big data analytics and NoSQL databases. Even though these two revolutions have completely different purposes, their independent developments complement one another, and their convergence would be extremely beneficial to businesses in terms of making time-sensitive decisions using large amounts of complex data sets that are both structured and unstructured. However, they lack comparative analysis and associates in nursing benchmarking. To match the choices of the four primary NoSQL knowledge models that have been developed, this research seeks to provide an Associate in Nursing

comprehension of their contexts. The performance comparison of traditional SQL and NoSQL data for big data analytics reveals that the NoSQL database presents to be a far better possibility for business objects that demand simplicity, capability, high-performance analytics, and distributed quantifiability of big data. This article concludes that the NoSQL movement should be used for large-scale knowledge analytics and would coexist with comparable (SQL) databases.

Massive information, also known as giant information sets, is a field that has important applications in many different industries, according to Sravanthi et al. (2015). These information sets have a large amount of knowledge, a diverse and complex structure, and are challenging to analyze store, and visualize for any processes or outcomes. Today's huge amounts of information are best utilized by corporations, organizations, firms, and other entities. So much data has so many uses in so many industries, including finance, marketing, stocks, BDA, healthcare, banking, agriculture, chemistry, data processing, and cloud computing. A thorough justification for those applications is presented in this study. Each of these fields had its idea, provided its application, and was coupled with a wealth of information. These are also swiftly employed in a variety of industries, including the public and private sectors of industry. The use of enormous information in many fields, including information mining, cloud computing, banking, marketing, health care, finance, and enterprise applications, has been explored in various articles supporting big information so far. An outline has been provided here.

According to Tojiboyev et al. (2022), the main goal is to clarify how structured command language (SQL) queries will make it easier for auditors to repeatedly retrieve properly formatted information as audit-proof or for any analysis. It exhibits exploitation through knowledge extraction. One of the top information software packages that are SQL-compliant is Microsoft (MS) Access. To run SQL queries as part of audit investigations, we frequently use a dataset fragment that was taken from publicly available enterprise datasets made available by Walton School (University of Arkansas). Knowledge extraction is that the beginning of Extract, Transform, and Cargo (ETL) will take a while. We usually show how SQL queries can help with this work, allowing the auditor to start the investigation more quickly. Future auditors will be well-prepared for the increasingly data-rich and technologically advanced company environment with the help of this teaching resource.

III.   OBJECTIVES

Advantages of Tableau
1. Quickly construct an interactive visualization: Tableau's drag-and-drop functionality allows

users to quickly build an interactive visual representation

2. Convenient implementation: Tableaus offer a variety of visualization possibilities. In contrast to Python, it is simpler to learn. Tableau is also simple to understand for those without any coding expertise or skills

3. Easily handle enormous data volumes: A variety of visualizations can be made using a lot of data without impairing dashboard performance

4. Other scripting languages are usable: Users can use Python or R to execute sophisticated calculations and prevent performance problems. However, Tableau does not recognize Python as a native programming language, so you would have to import some of the packages or visualizations

5. Mobile-friendly: Users of iOS and Android devices can access a mobile app that keeps statistics close at hand

6. Large customer resource: It includes a variety of in-depth online resources, including guides, training, etc

7. High performance: As you use the worksheet, it keeps track of performance data for significant events. It has excellent performance

8. Low cost: Compared to other big data competitors like Qlik and Business Objects, Tableau is a comparatively inexpensive option

Disadvantages of Tableau

1. Tableau can only work with cleansed data and focuses mostly on visualization

2. Users complain that Tableau's help is terrible and that they must figure out the problem on their own

3. When developing data logic and dashboards, there is a lack of version control and cooperation

4. Data analysts cannot model data or create data dictionaries

Advantages of SQL

1. Quicker query processing: A lot of data is swiftly and effectively retrieved. Data manipulation, insertion, and deletion operations can all be completed almost instantly

2. No coding is necessary: A significant number of lines of code are not necessary for data retrieval

3. Standardized language: As a result of extensive documentation and years of establishment, it offers a consistent platform to all its customers across the globe

4. Portable: It can be utilized in programs on PCs, servers, and laptops regardless of the platform (Operating System, etc)

5. Interactive language: Simple to learn and comprehend, can quickly respond to difficult questions

Disadvantages of SQL

1. Challenging interface: Few users find SQL's interface to be comfortable when working with databases

2. Price: Some versions are expensive, therefore programmers cannot use them

3. Partial control: The database does not have full control because of business rules

4. Rigidity: They are not adaptable, and adjustments are frequently challenging and time-consuming

5. Hardware: It can soon become out-of-date, each upgrade is pricey, and ongoing operating and maintenance costs are also substantial.

IV.   DISCUSSION

Every employee in the company can now see and understand their data more clearly, thanks to Tableau and SQL, which makes it easier for them to make effective decisions.

Making decisions involves anticipating circumstances that may arise while a program is being executed and defining the actions to be taken in response to those circumstances. With this tactic, selections are made based on what you believe to be the best option.

Multiple expressions are evaluated by decision structures, and the results are TRUE or FALSE. If the outcome is TRUE or FALSE, you must decide which statement to run and which action to take.

BDA is a procedure that comprises gathering, analyzing, and interpreting data for multiple functional divisions to produce business value, generate competitive advantage, and produce actionable insights.

Programming languages use decision-making statements to control the execution of programs.

Tableau enables users to put a collection of visuals together to create a visual narrative that conveys data insights, gives context, and shows how decisions affect results. We refer to Tableau as a "SMART PLATFORM," which stands for a quicker and more intelligent decision-supporting platform, David explained.

To prevent slow performance, SQL mandates that a statement be executed for each row. There are other potential sequential processing options, but they are all labour-intensive and have the same performance restrictions.

V.   CONCLUSION

Data visualization, business intelligence, data analysis, communication, statistics, data modelling, analytical capabilities, data validation, and forecasting

are among the skills that Tableau possesses. While SQL possesses abilities such as execution, PHP, database management, OLAP, Microsoft SQL server, and more. These abilities aid in problem analysis and speedy interactive viewing of massive datasets. Decisions are made using data-driven decision-making, rather than what you believe to be the greatest option. Data can be quickly modified or deleted because coding knowledge is not necessary. Tableau and SQL software has several benefits, including the usage of different programming languages and the ability to run on any operating system, even though there are a few minor drawbacks that need to be addressed. Everyone may easily learn them, and they are convenient to use. As a result, business analytics for decision-making can be efficiently employed with Tableau and SQL software.

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