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NoSQL Database Classification:
New Era of Databases for Big Data

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ABSTRACT

The rapid growth in the digital world in form of exponentiation to accommodate huge amount of structured, semi-structured, unstructured and hybrid data received from different sources. By using the conventional data management tools, it is quite impossible to manage this semi-structured and unstructured data for which a non-relational database management system such as NoSQL and NewSQL are used to handle such types of data. These types of semi-structured and structured data are generally considered 'Big Data.' This article describes the basic characteristics, background and the models of NoSQL used for big data applications. In this work, the authors surveyed different NoSQL characteristics used by the researchers and try to compare the strength and weakness of different NoSQL databases.

KEYWORDS

Big Data, NewSQL, NoSQL, RDBMS, SQL

1. INTRODUCTION

Relational Data Base Management Systems (RDBMS) are used to store, retrieve and manipulate the data stored in a tabular form. Due to the need of the society, the type and amount of data generated has drastically changed from Giga byte to Zeta byte which requires a non-relational database to store, retrieve and manipulated these unstructured data which comes from different sources of the web applications. NoSQL, abbreviated for "not only sql", is a non-relational database management system, primarily not built on tables and generally do not use Structured Query Language (SQL) for data manipulation in which the nature of data is non-relational (,). With the increase in the use of various web applications which generate huge amount of data made the database more demand mainly for efficiently storing, accessing the big data, high concurrent of reading and writing with low latency, high scalability and high availability. It also further requires slow management and operational costs, high capacity and easy expansion. To solve so many requirements in today's web

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world, a wide range of alternative recent sorts of databases have appeared (). Generally, these alternative databases are terribly completely different with conventional relational databases; therefore, it's called as "NoSQL" database that refers to 'Not Only SQL' which does not take only tabular form. After the initiation of the scenery of NoSQL, we will specialize in the pros and cons of NoSQL database (Petrides et al., 1993).

Therefore, the goal of this paper is to rank OTA websites on the basis of website quality success factors. The organization of the paper is as follows: Section 2 is a review of the related literature. Section 3 presents our methodology. In this section, we describe the intuitionist multi criteria decision making approach to rank online travel agency (OTA) websites on the basis of constructs measuring website quality success. Section 3 also presents the findings after applying our model. Here we present rankings based on seven website quality service factors namely trust, tangibility, customization, ease of ordering, navigation, system availability, ease of use, responsiveness, and interactivity of electronic word-of-mouth (EWOM) systems. Section 4 discusses the significance, limitations, and recommendations for future research for this study.

2. BACKGROUND

The basic goal of Relational Database Management System (DBMS) is to use data processing in business applications to store the business transactions data, financial records and personal data related to an organisation (Browne). The traditional database stores the data in the form of relational tables which is applicable only for structured data. So there is a challenge to deal with semi-structured and unstructured data (Han, Haihong & Le et al., 2011). As a result of which people have adopted variety of non-relational databases referred as NoSQL (Du et al., 2010). The primary advantages of NoSql are mainly quick accessibility, storing massive data and also easy to expand with low cost (Tudorica & Burcer, 2011). The characteristics of NoSQL database can be given in Figure 1.

The CAP theorem described the conflicts between the distinctive parts of high accessibility in dispersed frameworks that are not completely feasible (Potter, 1985):

- **Consistency:** All the servers in disseminated framework we have similar information so anybody utilizing the framework will get a similar duplicate paying little heed to which server answer their solicitations (Ericsson, 2012);
- **Accessibility:** The framework will dependably react to a demand (regardless of the possibility that it is not the most recent information or predictable over the framework (Karun et al., 2013);
- **Partition Tolerance:** The framework keeps on working in general regardless of the possibility that individual servers come up short or can't be come to (Elif et al., 2013).

Many of the NOSQL databases particularly have untangled up the wants on Consistency so as to attain higher availableness and Parceling. This brought about frameworks perceive as BASE (Basically open, Soft-state, in the end predictable) (Du et al., 2010). These haven't any exchanges inside the traditional sense and present limitations on the information model to change higher segment plans. Han, Haihong, Le, and Du (2011) characterizes NoSQL databases with regards to the CAP hypothesis (Du et al., 2010) (Tudorica et al., 2011), thinks about exploitation numerous criteria between numerous NoSQL databases (Tudorica & Burcer 2011). Essential Uses of NoSQL databases are Massive-scale process/handling (parallel preparing over dispersed frameworks), Embedded IR (fundamental machine-to-machine data gaze upward and recovery), Wildcat examination on semi-organized learning (master level); and Large volume information stockpiling (unstructured, semi-organized and organized) (Jad et al., 2011).

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