**Database Management System**

A database management system (**DBMS**) is software to create and manage databases, allowing users to create, read, update and delete data in a database.

**Relational Database Management System**

A system used to maintain relational databases is a relational database management system (**RDBMS**). Many relational database systems are equipped with the option of using the SQL (Structured Query Language) for querying and maintaining the database.

**Structure Query Language**

Structured Query Language (**SQL**) is a domain-specific language used in programming and designed for managing data held in a relational database management system (RDBMS), or for stream processing in a relational data stream management system (RDSMS).

**Microsoft SQL Server**

Microsoft SQL Server (**MSSQL**) is a relational database management system developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications—which may run either on the same computer or on another computer across a network (including the Internet).

**Comparing MySQL and MSSQL**

Similarities

1. **Tables** - MySQL and MSSQL utilize the standard table model for column-and-row-based data storage found in relational databases.
2. **Quality Performance** -As databases are responsible for both retrieving and storing data in the shortest time possible, they are your applications’ backbone. Fortunately, MySQL and MSSQL Server provide high-quality performance speeds.
3. **Keys** - MySQL and MSSQL leverage both primary and foreign keys for creating relationships between tables.
4. **Keys** - MySQL and MSSQL leverage both primary and foreign keys for creating relationships between tables.
5. **Convenient Scalability** - MySQL and MSSQL have the ability to scale with your business as it continues to grow. They can be used for projects of all sizes, capable of supporting millions of daily transactions.
6. **Syntax** - Both platforms share a similar syntax, though there are some minor differences across create, read, update, and delete (CRUD) statements.
7. **Drivers** - Connection drivers for virtually any popular language can be found online relatively simply. As a result, you can connect MySQL and MSSQL without getting involved in complex coding.

Differences

1. **Operating System Compatibility** - MSSQL Server was developed by Microsoft for Windows OS only, but it has since made RDBMS available for both Linux and Mac OS too. That means that enterprises can run the database system across three distinct platforms, though users still don’t have the option to utilize specific capabilities when using SQL Server on Mac OS X or Linux. However, MySQL offers smooth performance on several well-known operating systems such as Windows, Mac OS X, and Linux.
2. **Quality** **Support** - Various programming languages are supported by both MySQL and MSSQL, including C++, Ruby, Java, Python, PHP, Virtual Basic, Delphi, and Go. MySQL offers support for extra languages, too, such as Perl, Eiffel, Haskel, and Tcl. Due to MySQL’s versatility, it has gained popularity in numerous developer communities. While you can take advantage of both types of databases for Linux and Windows projects, MySQL works with PHP natively and MSSQL Server is primarily used with .NET. If you rely on MySQL for PHP and MSSQL Server for Windows projects only, you can expect simpler integration.
3. **MyISAM** **and** **InnoDB** - MyISAM and InnoDB are MySQL configurations, enabling developers to undertake various activities related to programming and design. MSSQL Server won’t let you specify different engines while creating databases.
4. **Affordability** - As MySQL is open source, it’s a free option, but you will need to pay for support when necessary. However, with MSSQL, you will require licenses for servers running the platform, which makes it more costly.
5. **LINQ** - As MSSQL Server lets you configure your entity framework classes in .NET, you may begin with LINQ queries. But you would have to download third-party tools instead for using .NET with MySQL.
6. **IDE Tools** - MySQL and MSSQL both have IDE tools, but you will have to align the correct tool with the correct server: Enterprise Manager for MySQL, and Management Studio for MSSQL. Both tools enable you to establish a server connection and set up your security, architecture, and table design configurations.
7. **Binary Collections** **-** Both MySQL and MSSQL Server were made as binary collections. MySQL lets developers utilize binaries for manipulating database files while running, and database files can also be manipulated by alternative processes at runtime. On the other hand, MSSQL Server prevents processes from manipulating or accessing binaries or database files. You would be required to run an instance if you intended to achieve this. As a result, hackers will be unable to perform any direct data manipulation — or even access it in the first place. Overall, MSSQL Server offers tighter security than MySQL.
8. **Data Backup** - You should extract your data as SQL statements to back it up when using MySQL. The RDBMS provides you with a tool for blocking the database while your data is backed up, which minimizes the risk of data becoming corrupted when switching between different editions or versions of MySQL. The drawback of this is that restoring data becomes a time-consuming task, as you would need to execute several SQL statements. But MSSQL Server doesn’t block the database during data backup, which allows users to backup and restore huge amounts of data with ease.
9. **Freedom** **to End Query Execution** - Users cannot cancel a query after it begins running on MySQL: you would need to kill the whole process. But MSSQL Server lets users truncate database queries while running without requiring the whole process to be killed. Furthermore, MSSQL Server incorporates a transactional engine for maintaining a consistent state. That provides MSSQL Server with a key advantage over MySQL.