**Database Selection and Analysis Report for Project 6D**

1. Intro to the project

As requested by the boss in the meeting, research databases on the market for business new back-end project.

1. Database requirements for the project (Criterion1 – at least 5 important to boss)

Several needs are summarized based on the meeting.

* 1. Quick and easy solution
  2. Minimal setup
  3. No special hardware/software required
  4. Cross-platform
  5. No special network accesses
  6. Single-user access
  7. Easy backup to USB flash drive
  8. Low cost
  9. Can transfer to other databases easily later
  10. Python compatible

1. Main Database Analysis Options (Criterion2 – number of rank from 1-5)
   1. Microsoft SQL Server (MSSQL)

Microsoft SQL is a robust, enterprise grade database, it designed for very high performance and scalable data management. It supports multiply users and workloads, it can integrate seamlessly with another Microsoft ecosystem software. Offering advanced security. However, it’s very expensive and license limitations. What’s more, it difficult to study for beginner, for small group it’s hard to study and complexity to setting. It runs primarily on the Windows platform, so not good for cross-platform, or difficult to deploy in non-Windows environments.

* 1. Oracle

Installation and configuration are a complex that may need require more time and effort. No special hardware and software required, it can run on different system platform. Oracle database support a wide range of platforms to meet the cross-platform needs. It can run in local mode without network connection, and it supports single-user mode too. What’s more, it supports data backup to external storage devices, including USB flash drives. The commercial licenses are expensive for individual users and small projects. And Oracle provides data export tools to help people migrate data to other database system. Lastly, Oracle supports python language, so can deploy database using python.

* 1. SQLite

SQLite is a powerful, open source database, it’s good for single user non-concurrent access, and it’s works on local hard drive, so it’s not over the network. It’s very lightweight but high-performance, cross-platform can work on Linux, Windows, Mac, Android, and Window Mobile. No installation required, reliable, portable, easy to access and cost-effective, what’s more it built with python.

<https://sqlite.org/whentouse.html>

* 1. MySQL (or MariaDB)

The advantages of MariaDB include being completely open source and compatible with MySQL's protocol. At the same time, it is better than MySQL in terms of scalability and query speed, and is suitable for managing large-scale data. The difference is that it is powered by MariaDB and developed by the original core MySQL team, focusing on user flexibility and freedom, and providing more features that MySQL does not have. MySQL and MariaDB are each suitable for different use cases. MySQL is widely adopted and provides strong transaction support, while MariaDB is more suitable for processing large-scale data and has faster query speed. Choosing the right database depends on specific needs and preferences.

<https://mariadb.org/>

* 1. PostgreSQL

As an open source object-relational database management system, PostgreSQL has many advantages, including open source and scalability, ACID compatibility and strong security, compatibility and support, as well as scalability and performance. However, it also has some disadvantages, such as complexity and performance issues, adoption and resource constraints, database structure and maintenance challenges, and the potential need for specialized hardware or software.

<https://www.postgresql.org/>

<https://www.postgresql.org/about/>

* 1. Microsoft Access

Microsoft Access has several advantages and disadvantages. Some of the benefits include ease of learning and use, rapid development and prototyping, integration with Microsoft Office, data security and rights management, and customizable user interface. Additionally, it's also fast and easy to build something usable, making it ideal for proof-of-concept development. However, Microsoft Access also has some limitations, such as limited scalability and performance, relational database constraints, concurrent user limits, lack of version control and collaboration features, and compatibility and portability issues.

* 1. LibreOffice Base

LibreOffice Base, as the database component of the LibreOffice suite, has the advantages of open source and free, strong compatibility, community support and multi-platform availability. However, some users may be dissatisfied with its unrefined user interface, compatibility challenges, and lack of professional support and advanced features. To sum up, LibreOffice Base is a free and open source database management tool suitable for different operating systems, but it may have some limitations compared with commercial office suites in some aspects.

<https://www.libreoffice.org/>

1. Analysis of Databases

Based on the requirements to analysis each database.

1. Evaluation of Databases Options (Criterion3 – database rated 0 to 5)

Draw the table to give each database points.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Features  Rank 1-5 | MSSQL  Rank 0-5 | Oracle  Rank 0-5 | SQLite  Rank 0-5 | MySQL  Rank 0-5 | PostgreSQL  Rank 0-5 | Microsoft Access  Rank 0-5 | LibreOffice Base  Rank 0-5 |
| Quick and Easy solution |  |  |  |  |  |  |  |
| Minimal Setup |  |  |  |  |  |  |  |
| No Special H/S required |  |  |  |  |  |  |  |
| Cross-platform |  |  |  |  |  |  |  |
| No special network access |  |  |  |  |  |  |  |
| Easy backup |  |  |  |  |  |  |  |
| Low-Cost |  |  |  |  |  |  |  |
| Easy Transfer |  |  |  |  |  |  |  |
| Python compatible |  |  |  |  |  |  |  |
| Total -> |  |  |  |  |  |  |  |

1. Conclusion and Recommendation