Optimizing Business Operations: The Role of Relational Databases in Enhancing Scalability and Performance

Vadym Kharchenko

University of Maryland Global Campus

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Prof. Candice Adams

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Our App Development business is expanding, and more and more problems emerge with performance and scalability in data management. Larger, more complex datasets are too much for our current system to handle, which leads to slower processing times and decreased efficiency. To fight the problem I propose a Relational Database Management System (RDBMS). RDBMS can potentially improve performance and scalability while offering instances of its effective application in other sectors of the economy.

Understanding Relational Databases

A relational database is a system that organizes data into tables, each table represents a particular kind of information. Relationships between these tables allow for effective data management and retrieval. An RDBMS, in contrast to conventional file systems, can manage giant data volumes without experiencing considerable performance drops. "Relational databases might need to improve speed when maintaining massive datasets or conducting analytical queries against them because the database structure does not necessarily scale well with rising demands on memory and processing capacity" (Kafi & Akter, 2023). Thus, it's the ideal solution for businesses like ours that need to grow without sacrificing dependability or speed.

Improving Scalability and Performance

The ability of an RDBMS to scale with our business is one of its key advantages. The system can expand as we add more data without the need to be completely replaced. As our business expands, this scalability will be paramount to maintaining high performance. Also, it is possible to access and analyze big datasets quickly with an RDBMS, which speeds up the

process of making defensible decisions, making the system more efficient.

Indexing is another way that an RDBMS maximizes performance by speeding up data retrieval. As Codd (2007) states, "if suitably fast access paths are supported (e.g., hashing), there is no reason why a high-level language such as SQL, QUEL, or QBE should result in less efficient runtime code for these simple transactions than a lower-level language." The total productivity will increase drastically as a result of the system's effective data organization and the speed of data retrieval.

Examples from Other Industries

RDBMS solutions have been successfully integrated by numerous businesses in various industries to address comparable issues. An RDBMS, for instance, was implemented by a multinational retailer to handle its growing customer database. This helped them manage inventory, process transactions fast, and identify sales patterns when their company expanded nationwide. "Since the inception of databases, Relational Databases dominated for over 30 years until the year 2000 when NoSQL databases began to replace them in some applications" (Kunda & Phiri, 2017). Yes, there are advantages and disadvantages to RDBMS, but even today they are more advantageous for many scenarios.

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Conclusion

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In conclusion, to mitigate the problems of scalability and performance issues that our organization is currently facing, we must implement a Relational Database Management System. It will ensure that our data management procedures stay effective as we expand by integrating RDBMS. The benefits we can potentially harvest are illustrated by the examples from other industries, which provide a compelling justification for proceeding with this project. To improve

our business operations, I urge you to take this proposal under consideration and to approve the

installation of an RDBMS.

References

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