

ABSTRACT

COMPARATIVE ANALYSIS OF OBJECT-RELATIONAL MAPPING (ORM) AND SQL QUERY IN THE IMPLEMENTATION OF BOOKING SERVICE *API* AT PT TUNAS DWIPA MATRA

By

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Information technology plays a vital role across all industries. PT Tunas Dwipa Matra recognizes this importance, understanding that an effective IT system is crucial for business operations and customer service. This study examines the performance of ORM and SQL queries in database operations, focusing on execution speed and memory efficiency across datasets of 10.000, 50.000, and 100.000 records. From this research, ORM showed significantly faster execution times, while maintaining comparable memory usage for both methods. Although, as data volume increased to 100.000 records, SQL's execution time grew substantially about 1,952s on average compared to ORM's more stable performance about 0,037s on average, with slightly 0,2 MiB more memory requirements. The study confirms ORM offers developer-friendly implementation and consistent memory efficiency, while SQL provides better scalability for complex queries. These findings suggest PT Tunas Dwipa Matra could optimize their system by using ORM for routine operations and SQL for large-scale data processing, achieving both performance efficiency and maintainability in their customer service applications.

Keywords: Object Relational Mapping (ORM); SQL Query; Performance Testing; Execution Speed; Memory Efficiency.