ABSTRACT

E-learning systems in higher education generate large volumes of data related to learning activities, especially through platforms like Learning Management Systems (LMS) such as Moodle. The Extract, Transform, Load (ETL) process is crucial for integrating this data into a data warehouse to support further analysis. However, the performance of the ETL process often poses challenges, particularly in terms of execution time efficiency.

This study aims to implement and analyze the performance of the ETL process in an e-learning data warehouse using Pentaho Data Integration (PDI), with a focus on execution time testing. The experiments are conducted using several extraction methods in PDI, including Table Output, switch, and Sync After Merge. Additionally, experiments are conducted with datasets of up to one million records to evaluate scalability and process efficiency. The results of this research provide insights into the best configurations to improve execution time efficiency in the ETL process, which is crucial for supporting data analysis needs in educational institutions.

Keywords: *Business intelligence, Data warehouse, ETL, E-learning*