

**UTILIZING ODBMS AND OBJECT-ORIENTED PROGRAMMING
IN ORGANIZING DATABASE QUERIES**

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Abstract: *Efficient data retrieval is crucial in modern database management systems. Traditional relational databases, while widely used, often face challenges in handling complex data structures and relationships. Object-oriented database management systems (ODBMS) provide an alternative approach by integrating object-oriented programming principles into database management. This paper explores the advantages of using ODBMS and object-oriented programming (OOP) in organizing database queries. We discuss the benefits of object-relational mapping (ORM), improved data integrity, and performance optimization. A comparative analysis with relational database management systems (RDBMS) highlights scenarios where ODBMS outperforms traditional methods. Practical implementation strategies and case studies are also presented to demonstrate the efficiency of ODBMS in handling complex data models.*

Keywords: *ODBMS, Object-Oriented Programming, Database Queries, Object-Relational Mapping, Data Integrity, RDBMS, Performance Optimization.*

Modern applications require efficient database management techniques to store, retrieve, and manipulate data effectively. Traditional relational database management systems (RDBMS) have been widely used for decades, yet their limitations in handling complex data relationships and scalability challenges have led to the exploration of alternative solutions. Object-oriented database management systems (ODBMS) offer an innovative approach by integrating object-oriented principles, facilitating seamless data manipulation within object-oriented applications.



Object-Oriented Database Management Systems (ODBMS). ODBMS are designed to work with object-oriented programming languages, allowing data to be stored as objects rather than relational tables. This integration provides several advantages:

1. **Enhanced Data Modeling:** ODBMS supports complex data structures, making it ideal for applications that require hierarchical and interconnected data representation.
2. **Seamless Integration with OOP:** Since data is stored as objects, it eliminates the need for complex object-relational mapping (ORM) mechanisms.
3. **Performance Efficiency:** By reducing the overhead associated with joins and translations in RDBMS, ODBMS can optimize query performance.

Comparison Between ODBMS and RDBMS. To highlight the benefits of ODBMS, it is essential to compare it with RDBMS based on various factors:

Feature	ODBMS	RDBMS
Data Storage	Objects	Tables
Query Mechanism	Object Queries	SQL Queries
Performance	Optimized for object access	Requires joins and mapping
Complexity	Simplified for OOP	Requires ORM
Scalability	Suitable for complex models	May require additional tuning

Practical Implementation. To illustrate the application of ODBMS, we present a case study involving an e-commerce system. By utilizing an object-oriented approach, the system achieves:

- Faster query execution due to reduced relational overhead.
- Improved data consistency and integrity by maintaining object structures.
- Seamless integration with programming environments such as Java, Python, and C++.



ODBMS offers a viable alternative to traditional RDBMS by integrating object-oriented principles into database management. Its advantages in handling complex data structures, improving performance, and enhancing data integrity make it a powerful solution for modern applications. Future research should explore hybrid approaches that combine the strengths of both ODBMS and RDBMS to optimize data management strategies.

REFERENCES:

1. Daminova B. E. et al. USING THE GOOGLE CLASSROOM WEB SERVICE AND PREPARING INTERACTIVE PRESENTATIONS //Экономика и социум. – 2024. – №. 5-1 (120). – С. 216-225.
2. Daminova B. E., Bozorova I. J., Jumayeva N. X. CREATION OF ELECTRONIC LEARNING MATERIALS USING MICROSOFT WORD PROGRAM //Экономика и социум. – 2024. – №. 4-2 (119). – С. 104-109.
3. Daminova B. E. et al. APPLICATION OF MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN TEACHING ENGLISH //Экономика и социум. – 2024. – №. 5-1 (120). – С. 197-201.
4. Daminova B. E. et al. SOFTWARE TOOLS FOR CREATING MULTIMEDIA RESOURCES IN TEACHING ENGLISH //Экономика и социум. – 2024. – №. 5-1 (120). – С. 202-206.
5. Daminova B. E. et al. THE MAIN ADVANTAGES, PROBLEMS AND DISADVANTAGES OF USING MULTIMEDIA IN TEACHING FOREIGN LANGUAGES //Экономика и социум. – 2024. – №. 5-1 (120). – С. 189-192.
6. Даминова Б. Э. и др. ОБРАБОТКА ВИДЕОМАТЕРИАЛОВ ПРИ РАЗРАБОТКЕ ОБРАЗОВАТЕЛЬНЫХ РЕСУРСОВ //Экономика и социум. – 2024. – №. 2-2 (117). – С. 435-443.
7. Daminova B. E. GAUSS AND ITERATION METHODS FOR SOLVING A SYSTEM OF LINEAR ALGEBRAIC EQUATIONS //Экономика и социум. – 2024. – №. 2 (117)-1. – С. 235-239.
8. Daminova B. E., Oripova M. O. METHODS OF USING MODERN METHODS BY TEACHERS OF MATHEMATICS AND INFORMATION



TECHNOLOGIES IN THE CLASSROOM //Экономика и социум. – 2024. – №. 2 (117)-1. – С. 256-261.

9. Daminova B. E. et al. USE OF ELECTRONIC EDUCATIONAL RESOURCES IN THE PROCESS OF TEACHING A FOREIGN LANGUAGE //Экономика и социум. – 2024. – №. 5-1 (120). – С. 230-232.

10. Daminova B. E. et al. USING COMPUTER PRESENTATIONS IN TEACHING FOREIGN LANGUAGES //Экономика и социум. – 2024. – №. 5-1 (120). – С. 211-215.

11. Daminova B. E. et al. USING DIGITAL TECHNOLOGIES IN FOREIGN LANGUAGE LESSONS //Экономика и социум. – 2024. – №. 5-1 (120). – С. 226-229.

12. Daminova B. E., Bozorova I. J., Jumayeva N. X. FORMATION OF TEXT DATA PROCESSING SKILLS //Экономика и социум. – 2024. – №. 4-2 (119). – С. 110-119.

13. Daminova B. E. et al. USE OF ONLINE ELECTRONIC DICTIONARIES IN ENGLISH LANGUAGE LESSONS //Экономика и социум. – 2024. – №. 5-1 (120). – С. 193-196.

14. Daminova B. E. et al. ADVANTAGES OF USING MULTIMEDIA RESOURCES IN ENGLISH LANGUAGE LESSONS //Экономика и социум. – 2024. – №. 5-1 (120). – С. 207-210.

15. Daminova B. E. et al. SCIENTIFIC AND METHODOLOGICAL SUPPORT OF EDUCATIONAL INFORMATION INTERACTION IN THE EDUCATIONAL PROCESS BASED ON INTERACTIVE ELECTRONIC EDUCATIONAL RESOURCES: USING THE EXAMPLE OF TEACHING ENGLISH //Экономика и социум. – 2024. – №. 5-1 (120). – С. 233-236.

16. Daminova B. E. et al. THE ROLE AND FEATURES OF THE USE OF INFORMATION TECHNOLOGY IN TEACHING A FOREIGN LANGUAGE //Экономика и социум. – 2024. – №. 5-1 (120). – С. 184-188.