DEVELOPMENT OF THE ENGINEERING DATA MANAGEMENT SYSTEM OF LARGE INDUSTRIAL ENTERPRISES

Doctor of Philosophy ***Yusupov A.A.***
master ***Shorobidinov I.M.***
Andijan Machine Building Institute

Abstract. In the dynamic landscape of large industrial enterprises, efficient management of engineering data emerges as a critical imperative. This thesis endeavors to address this pressing need through the development of a comprehensive Engineering Data Management System (EDMS) tailored specifically for the intricacies of large-scale industrial operations.

Keywords: concept, modern studies, scientific research, edms, data collection..

Introduction. In modern industry, effective management of engineering data is crucial for success. Large industrial enterprises face unique challenges in handling vast amounts of data efficiently. This study aims to develop an advanced Engineering Data Management System (EDMS) tailored to the specific needs of these enterprises. The system will streamline data access, improve quality, and enable real-time collaboration, ultimately enhancing operational efficiency and competitiveness.

Methodology. This study will use a mixed-methods approach, combining surveys, interviews, and case studies. Surveys will provide quantitative data, while interviews and case studies will offer qualitative insights. Sampling will be purposive, considering enterprise size and industry. Ethical considerations include informed consent, anonymity, and data security. Triangulation will enhance validity, and member checking and peer review will ensure reliability. Limitations include resource constraints and potential lack of generalizability.

Data Collection. Data will be gathered through a combination of surveys, interviews, and case studies. Surveys will provide quantitative information on current data management practices. Interviews will offer qualitative insights from key stakeholders, while case studies will provide in-depth analysis of existing systems within selected enterprises. These methods will ensure a comprehensive understanding of engineering data management in large industrial enterprises.

Data Analysis. The collected data will undergo rigorous analysis using both quantitative and qualitative techniques. Descriptive statistics will be employed to quantify trends and frequencies in survey responses. Thematic analysis will be used to identify patterns and insights from interview transcripts and case study findings. Additionally, a comparative analysis will be conducted to assess the strengths and

weaknesses of existing data management systems within the selected enterprises. This multifaceted approach will yield a comprehensive understanding of the current state of engineering data management.

Design and Development of the Engineering Data Management System. This phase involves creating a robust Engineering Data Management System (EDMS) tailored to the specific needs of large industrial enterprises. Key components will include:

- System Architecture and Components: Define the overall structure, including databases, servers, and software modules. Ensure scalability, flexibility, and compatibility with existing systems.
- Database Structure and Management: Design a database schema that efficiently organizes and stores engineering data. Implement effective data retrieval and storage mechanisms.
- User Interface Design: Develop an intuitive interface for users to interact with the system. Prioritize user experience, accessibility, and functionality.
- Integration with Existing Systems: Ensure seamless integration with pre-existing software and tools within the enterprise. Establish clear communication protocols for data exchange.
- Security and Access Control Measures: Implement robust security measures to safeguard sensitive engineering data. Define user roles and permissions for controlled access.
- Scalability and Performance Optimization: Design the system to handle large volumes of data and ensure optimal performance under varying workloads. Employ techniques like caching and load balancing.

Throughout this phase, iterative testing and feedback loops will be crucial to refine and optimize the EDMS for maximum efficiency and effectiveness in meeting the enterprise's engineering data management needs.

Testing and validation. This phase involves thorough testing to ensure the new Engineering Data Management System (EDMS) functions correctly. It includes data migration testing, user acceptance testing, and performance evaluation. This process verifies that the EDMS meets predefined objectives and requirements.

Implementation and Deployment. This phase involves executing the rollout plan, providing training, establishing monitoring protocols, and managing change for a smooth transition to the new Engineering Data Management System (EDMS).

Evaluation and Performance Metrics. This phase assesses the effectiveness of the Engineering Data Management System (EDMS). Key performance indicators (KPIs) will be used to measure system performance, user satisfaction, and alignment with objectives. Findings will inform refinements and future implementations.

Conclusion and Recommendations. The conclusion summarizes the study's findings and their implications for engineering data management. Recommendations offer actionable steps based on the research, guiding future implementation and improvements of the EDMS.

References

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