STRUCTURE OF INFORMATION DATABASE MANAGEMENT SYSTEM

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Annotatsiya. Ushbu maqolada ma'lumotlar bazasini boshqarish tizimlari (DBMS) arxitekturasi va tuzilishi batafsil oʻrganilgan. Maqola DBMSning asosiy tarkibiy qismlari, jumladan, ma'lumotlar bazasi yadrosi, meta-ma'lumotlar boshqaruvi, tranzaktsiyalarni boshqarish tizimi, hamda indekslash va keshlash mexanizmlarini tahlil qiladi. Shuningdek, ma'lumotlarni samarali boshqarish va katta hajmdagi ma'lumotlar bilan ishlashni optimallashtirish uchun qoʻllaniladigan zamonaviy texnologiyalar yoritilgan. Maqolada ma'lumotlarning yaxlitligini ta'minlash usullari, xavfsizlik siyosatlari va foydalanuvchi huquqlarini boshqarish muammolari keng tahlil etilgan.
Kalit soʻzlar: ma'lumotlar bazasi tuzilishi, ma'lumotlar modeli, jadvalli munosabatlar, atributlar, maydonlar, qaydlar, asosiy kalit, xorijiy kalit, indekslar, koʻrinishlar, normallashtirish, ob'yekt-munosabat diagrammasi, cheklovlar, saqlangan protseduralar, ma'lumotlar bazasi mexanizmi, bulutga asoslangan DBMS, katta hajimli ma'lumotlar integratsiyasi.

Annotation. This article provides a comprehensive study of the architecture and structure of database management systems (DBMS). The article examines key DBMS components, including the database kernel, metadata management, transaction control systems, as well as indexing and caching mechanisms. It highlights modern technologies used to manage data efficiently and optimize working with large datasets. The article delves into methods for ensuring data integrity, security policies, and issues related to user rights management.
Keywords: database structure, data model, tabular relations, attributes, fields, notes, master key, foreign key, indices, views, normalization, object-relation diagram, constraints, stored procedures, database engine, cloud-based DBMS, large volume data integration.

Аннотация. Данная статья представляет собой всестороннее исследование архитектуры и структуры систем управления базами данных (СУБД). В статье анализируются ключевые компоненты СУБД, включая ядро базы данных, управление метаданными, системы контроля транзакций, а также механизмы индексирования и кэширования. Рассматриваются современные технологии, используемые для эффективного управления данными и оптимизации работы с большими объемами данных. В статье подробно освещаются методы обеспечения целостности данных, политики безопасности и вопросы управления правами пользователей.
Ключевые слова: структура базы данных, модель данных, табличные отношения, атрибуты, поля, примечания, главный ключ, внешний ключ, индексы, представления, нормализация, диаграмма объектных отношений, ограничения, хранимые процедуры, ядро базы данных, облачная СУБД, интеграция больших объемов данных.

Introduction

In the modern era of digital transformation, the effective management of data is pivotal for the success of any organization [1,2]. Databases and their associated management systems form the backbone of this process, enabling the efficient storage, retrieval, and manipulation of vast amounts of information. The structure of a Database Management System (DBMS) plays a critical role in determining its efficiency, scalability, and usability [3–6]. The structure of a DBMS encompasses several interrelated components, including the database schema, storage engine, query processor, transaction manager, and data dictionary, among others [7,8]. This theme focuses on exploring the intricate structure of information database management systems, delving into their key components, functionalities, and their interplay to ensure seamless data management. Understanding the structure of a DBMS is essential for designing robust systems capable of meeting the dynamic demands of various industries, including manufacturing, finance, healthcare, and telecommunications [9-11]. By examining the architecture, data models, and management processes inherent to DBMS, this discussion aims to provide insights into how these systems can be optimized to enhance organizational efficiency and support decision-making. Ultimately, the structure of a DBMS serves as the foundation upon which modern information systems are built, underscoring its significance in the digital landscape [12,13,14].

Metodology

In terms of composition, the databank represents organizational list data structures, the description of which can be found in the system feature bank. The amount of initial data is not determined in advance and depends on the area of the tasks to be solved. By its purpose the data bank is intended for data buffering, i.e., smoothing of time reserves between separate solved tasks, as well as for centralized storage and ensuring the reliability and validity of information [15-18]. A database management system (database management system) is used as a software tool. The use of a database management system makes it possible to unify data input-output and present it in the form of program modules, as well as to ensure the reliability and uniformity of information [19].

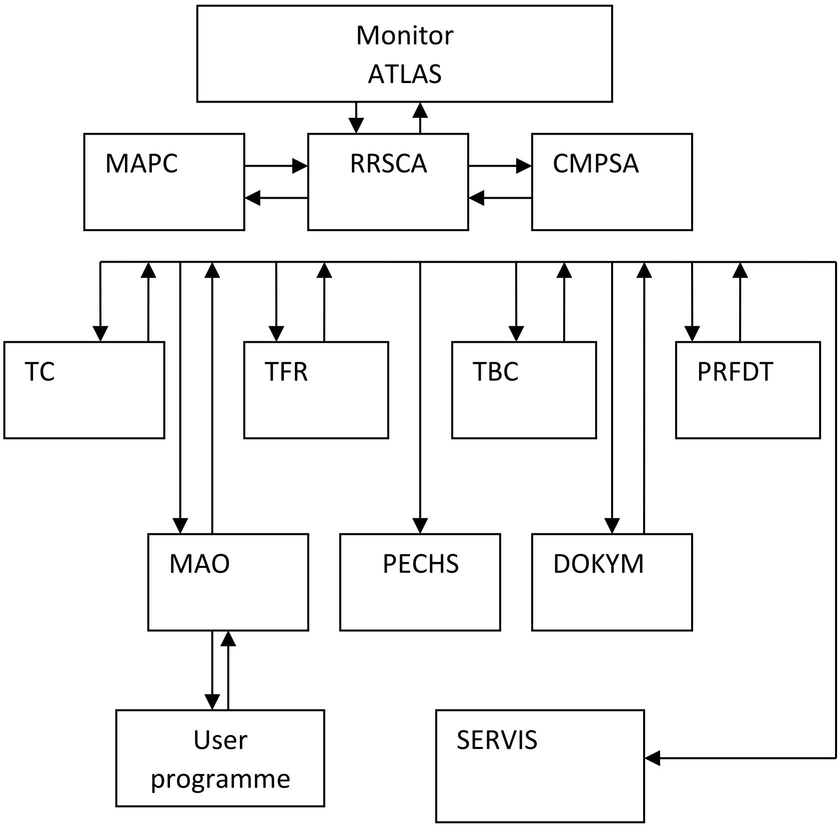

Fig.1. Structure of the Compass database management system.

The algorithmic process information system uses the Compass database management system, which consists of the following components: schema, fragment and related schema translators, as well as data manipulation language preprocessor, autonomous

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access module, utility group and resident executive system [20]. The resident executive system (the core of the system) consists of the Compass archive system, the resident database management system and the CMPSA administrative process monitor.
The structure of the Compass database management system is shown in Fig.1. The information part of the database is a set of data organized and used in the functional filling of the information system. A stored field in a database is the smallest unit of data. For example, a database containing information about parts may contain a type of stored fields - code (cipher) of parts - one instance of the field for each part. A stored record is a set of related fields. A stored file is a set of stored records of the same type [21].
The conceptual model is organized according to the full network structure method. In the Compass database management system, there are service tools of the system administrator.
The work of the service tools is initiated by special commands given in dialogue mode from the terminal.
The first group of service commands allows to receive various kinds of reference information (data composition). The next group of commands is used to exchange information between databases and the operating system (loading, copying information). Another group is for cataloguing, changing the password, modifying the data storage structure and compressing information.
There are also utilities for initializing the database dictionary, dumping the database, restoring the data dictionary, and printing data.

Conclusion

The developed algorithmic technological information system is used as a universal tool for creating a control system for a shop floor with discrete nature of production. The dialogue tools implemented in this system allow the developer of control systems in interactive mode to design and construct control systems in the available language and in the most convenient mode for him. The implemented bank of packages of applied programs in the system of algorithmic technological information system is oriented on performance of the following functions: carrying out of the analysis of tables of functioning on achievability and persistence; optimization of tables of functioning; the decision of planning problems at the level of a schedule of work of the technological equipment; maintenance of the model of production systems in operational mode; synthesis of tables of functioning; designing of the algorithmic model of management of production systems.

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