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后处理厂设计数据管理示范系统开发研究

摘要

多源异构数据模式下以业务数据标准为基础，构建动态可扩展数据模型、实现多维度数据交互联动是建立综合性信息化平台的基础。通过后处理厂设计流程梳理确定了数据标准化的范围、内容、数据类型以及数据流转过程；基于后处理厂设计流程开展了数据标准化与规范化研究，形成了标准化数据清册，为多源异构数据的识别和内在关联关系的建立提供基本准则和核心依据；以数据标准的对象类为基础建立了核燃料后处理厂 PBS（Plant Breakdown Structure）画布；利用数据库动态建模技术、联机事务处理（OLTP-Online Transaction Processing）和联机分析处理（OLAP-Online Analytical Processing）技术建立了数据存储模型，设计了数据处理主流程图；结合多板块对设计数据的需求和多层级微服务理念设计了系统的总体架构，开发了后处理厂设计数据管理示范系统，并在后处理示范工程建安中应用，为多板块数据深度应用提供了技术支撑。

关键词

后处理厂，设计数据管理，示范系统

Abstract

Building a dynamic and scalable data model based on business data standards under a multi-source and heterogeneous data environment, and achieving multi-dimensional data interaction is the foundation for establishing a comprehensive information platform. By analyzing the design processes of the reprocessing plant, the scope, content, data types, and data flow processes for data standardization have been determined. Based on the design processes of the reprocessing plant, research on data standardization and normalization has been conducted, resulting in a standardized data catalog, which provides basic guidelines and core references for identifying multi-source heterogeneous data and establishing their intrinsic relationships. Based on the object classes of the data standards, the Plant Breakdown Structure (PBS) canvas for the nuclear fuel reprocessing plant has been established. Using dynamic database modeling technology, as well as Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP) technologies, a data storage model has been developed, and the main data processing workflow has been designed. By integrating the design data requirements of multiple sectors and the concept of multi-level micro services, the overall system architecture has been designed, and a demonstration data management system for the reprocessing plant has been developed. This system has been applied in the construction of the reprocessing demonstration project, providing technical support for in-depth data applications across multiple sectors.

Keywords

Reprocessing Plant, Design Data Management, Demonstration System

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