BRC-DBMS: Database Management System for Biological Resource Centers.

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Abstract:

Biological Resource Centers (BRCs) have been established in many countries around the world to support conservation of biological diversity, supply materials for research and education and collect information related to biological materials and usage. Major activities of BRCs include preservation and maintenance, quality control of materials, distribution of materials, sharing of information between BRCs and to public. These activities generate a large amount and various formats of data and information such as publications, picture files, nucleotide sequence data, geographical coordinate data, storage management data, quality control data, service data and work history, etc. Continued increase of amount and complexity of data causes difficulty in storage, retrieval, sharing and analysis of data. In addition, to ensure quality of materials and data collected, traceability of quality management data is needed. Proper management of data helps to measure, monitor and improve work processes. Therefore, it is vital for BRCs to have information management systems that can handle various types and sizes of data and support quality management of materials and operating processes. BRC-DBMS was developed by focusing on functions and control systems that cover all activities of BRCs. Main functions of the system includes biomaterial data management, geographical data management, sequence data management, taxonomy checking, storage management, quality control data management, barcode systems, sample tracking, storage monitoring, usage logs, statistical reports, service data management, sample selection for cataloging, online catalogue, customer data management, data exchange systems, user management, backup and recovery. BRC-DBMS reduces complexity of data management by using a single system. The system can be used to monitor every step of processes to increase efficiency of work and quality of materials collected. More importantly, the system is designed for flexibility of use. Users can record a variety of formats and set topic and scope of data to be collected. Hence, fields of data of different materials can be input according to user needs. The system also eases the transfer of data between organizations and to the public in the desired formats. The system is easy and fast to be set up. BRC-DBMS consists of two subsystems: 1) biomaterial data management system in a Windows application and 2) Web-based cataloging system. Structure and operation of the two subsystems is in the form of client/server. The subsystems are managed separately, but communicate with each other through SOAP protocol. Not only BRCs, but BRC-DBMS can be used to manage materials collected in other types of organization, for example, laboratories in research institutes and hospitals.

Key words: Biological Resource Centers, Biomaterial, DBMS, Monitoring