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National Bookstore Inventory Management

Information Management

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In developing the National Bookstore Inventory Management System, a component that stands out as a candidate for NoSQL integration is the audit logging feature. The current system stores audit logs in a traditional relational table (audit_logs), which includes fields such as user_id, action, table_name, record_id, and timestamp. While this structure is functional, it lacks flexibility for storing rich, variable, and nested data that may evolve over time—such as storing metadata about changes, previous values, IP addresses, or device details.

A document-based NoSQL database like MongoDB would offer several advantages in this context. Each audit event can be stored as a JSON-like document, allowing dynamic fields to be added without altering a strict schema.

For example:


```
{
  "user_id": 15,
  "action": "UPDATE",
  "table": "books",
  "record_id": 101,
  "timestamp": "2025-05-08T12:45:00Z",
  "details": {
    "previous_title": "Old Book Title",
    "new_title": "New Book Title",
    "ip_address": "192.168.1.15"
  }
}
```


Using MongoDB, these logs can be queried using flexible conditions, such as retrieving all updates performed by a user within a date range, or filtering by nested fields like details.ip_address. This structure also improves performance for high-volume logging, since writes are faster and indexing is more customizable.

In conclusion, while MySQL is ideal for structured inventory data, incorporating a NoSQL approach for audit logs would enhance scalability and flexibility. This hybrid architecture aligns with modern best practices in systems that require both transactional integrity and adaptable data storage (MongoDB, 2024).