

# MEMORANDUM

**TO:** Data Analytics Team

**FROM:** Margaret Chen, Director of Operations, Central Library System

**DATE:** December 22, 2025

**RE:** Request for Database Analysis and Automated Solutions

## Executive Summary

Our library system has grown significantly over the past two years. However, this growth has exposed critical operational inefficiencies in our manual processes. We are requesting your expertise to analyze our database and implement automated solutions to address the following urgent issues.

## Critical Issues Requiring Immediate Attention

### 1. Overdue Book Crisis

#### The Problem:

We are experiencing a significant increase in overdue books, but our current system requires staff to manually check each borrowed book against return dates. This process takes approximately 15 hours per week across all branches and is prone to human error.

#### Business Impact:

- Lost revenue from unreturned books (estimated \$12,000 annually)
- Members keeping books 45-60 days instead of the 30-day limit
- Staff burnout from repetitive checking

#### What We Need:

An automated system that identifies all members with overdue books, calculates how many days overdue, and computes the appropriate fines (\$0.50 per day). We need this data to generate collection notices and understand the scope of our overdue problem.

### 2. Inefficient Book Return Processing

#### The Problem:

When members return books, our staff manually updates book availability status in

the system. With 200-300 returns per day across all branches, this creates bottlenecks at service desks, especially during peak hours (12-2 PM and 5-7 PM).

**Business Impact:**

- Average wait time of 12 minutes during peak hours
- Books showing as "unavailable" for 2-3 hours after physical return
- Member complaints about reservation system showing incorrect availability
- 15% decrease in member satisfaction scores related to service speed

**What We Need:**

An automated procedure that instantly updates book status to "available" when the return is logged. This should also record return date, book condition, and trigger any necessary follow-up actions without manual intervention.

### **3. Branch Performance Blind Spots**

**The Problem:**

Our management team lacks visibility into individual branch performance. We don't have standardized reports showing which branches are effectively serving the community and which may need additional resources or training.

**Business Impact:**

- Inefficient resource allocation (staffing, budget, inventory)
- Unable to identify best practices from high-performing branches
- Board of Directors requesting performance metrics we cannot easily provide
- Difficulty justifying budget requests with concrete data

**What We Need:**

A comprehensive performance report for each branch showing:

- Total books issued (circulation activity)
- Total books returned (completion rate)
- Revenue generated from rentals
- Comparison metrics across all branches

This will inform our Q1 2026 budget allocation and staffing decisions.

### **4. Member Engagement Analysis**

**The Problem:**

We invest significant resources in member outreach and retention programs, but we

cannot identify which members are actually engaged with our services versus those who registered but rarely visit.

**Business Impact:**

- Marketing budget wasted on inactive members
- Unable to target re-engagement campaigns effectively
- Membership database cluttered with dormant accounts
- Cannot measure success of recent promotional campaigns

**What We Need:**

A system to automatically identify "active members" (those who have borrowed at least one book in the last 60 days). This will help us:

- Focus retention efforts on engaged users
- Create targeted re-engagement campaigns for inactive members
- Measure the effectiveness of our recent "Summer Reading Challenge" promotion

## **5. Staff Productivity Recognition**

**The Problem:**

We want to recognize and reward our hardest-working staff members, but we lack objective metrics. Currently, performance reviews rely heavily on subjective manager observations.

**Business Impact:**

- Talented employees feeling undervalued
- Difficulty making promotion decisions
- Unable to identify training needs for underperforming staff
- Two recent resignations citing "lack of recognition"

**What We Need:**

A data-driven report identifying the top performing employees based on the number of book issues they've processed. This should include their branch information so we can recognize excellence at our quarterly all-staff meeting and inform performance bonuses.

## **6. Damaged Book Accountability**

**The Problem:**

We're experiencing higher-than-normal rates of damaged books, but we cannot

identify patterns or specific members who consistently return books in poor condition. Each damaged book costs \$15-\$45 to replace or repair.

**Business Impact:**

- Annual book replacement costs exceeding \$8,000
- Some members may be repeatedly damaging books without accountability
- Cannot implement fair damage fee policies without evidence
- Potential inventory loss if pattern continues

**What We Need:**

A query that identifies members who have issued books marked as "damaged" more than twice. This will help us:

- Have informed conversations with members about book care
- Implement graduated consequence policies based on data
- Understand if damage is concentrated with specific book types or member demographics

## **7. Real-Time Availability System**

**The Problem:**

Members frequently call or visit asking if specific books are available, but our current status system doesn't prevent issuing already-borrowed books. We've had three incidents this month where the same book was accidentally issued to two different members.

**Business Impact:**

- Member trust eroded by system errors
- Staff time wasted resolving double-booking conflicts
- Potential data integrity issues in our database
- Professional embarrassment for library leadership

**What We Need:**

An automated procedure that checks book availability before issuing. If a book is available (status = 'yes'), the system should issue it and immediately update the status to 'no'. If unavailable, the system should prevent issuance and notify the staff member with a clear error message.

## **Requested Deliverables**

1. **SQL queries or procedures** addressing each issue above

2. **Sample output reports** showing what the results will look like
3. **Documentation** explaining how staff should run and interpret these reports
4. **Recommendations** for additional analyses that might benefit operations

## **Conclusion**

These issues are significantly impacting our ability to serve our community effectively. We believe data-driven solutions will not only resolve current problems but position us for continued growth and excellence. Our members deserve a modern, efficient library system, and we're counting on your analytical expertise to help us deliver that.

Please contact me at [m.chen@centrallibrary.org](mailto:m.chen@centrallibrary.org) or ext. 2847 with any questions or to schedule a kickoff meeting.

Thank you for your partnership in improving our library services.

**Margaret Chen**

Director of Operations

Central Library System

# Database Keys & Relationships

## 1. BRANCH TABLE

- branch\_id (**primary Key**)
- manager\_id (**Foreign Key Key**) → References employees(emp\_id)

## 2. EMPLOYEES TABLE

- Emp\_id (**primary Key**)
- branch\_id (**Foreign Key Key**) → References branch(branch\_id)

## 3. MEMBERS TABLE

- Member\_id (**primary Key**)

## 4. BOOKS TABLE

- Isbn (**primary Key**)

## 5. ISSUED\_STATUS TABLE

- Issued\_id (**primary Key**)
- Issued\_member\_id (**Foreign Key Key**) → References members(member\_id)
- issued\_book\_isbn (**Foreign Key Key**) → References books(isbn)
- issued\_emp\_id (**Foreign Key Key**) → References employees(emp\_id)

## 6. RETURN\_STATUS TABLE

- Return\_id (**primary Key**)
- Issued\_id (**Foreign Key Key**) → References issued\_status(issued\_id)
- return\_book\_isbn (**Foreign Key Key**) → References books(isbn)