



ANNA LIBRARY

TEAM INT

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librarian



student library assistants



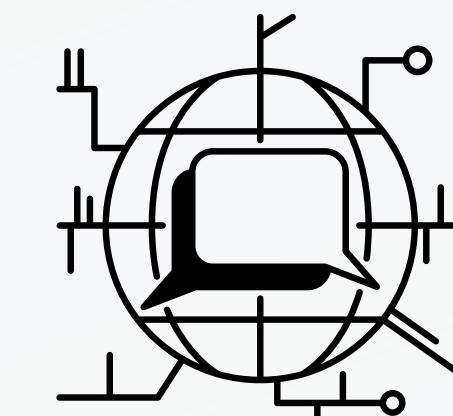
patron

ANNA LIBRARY

- efficient and effective loan services
- patrons can easily request and access library materials.



Library Catalog



Online Request System



ALMA

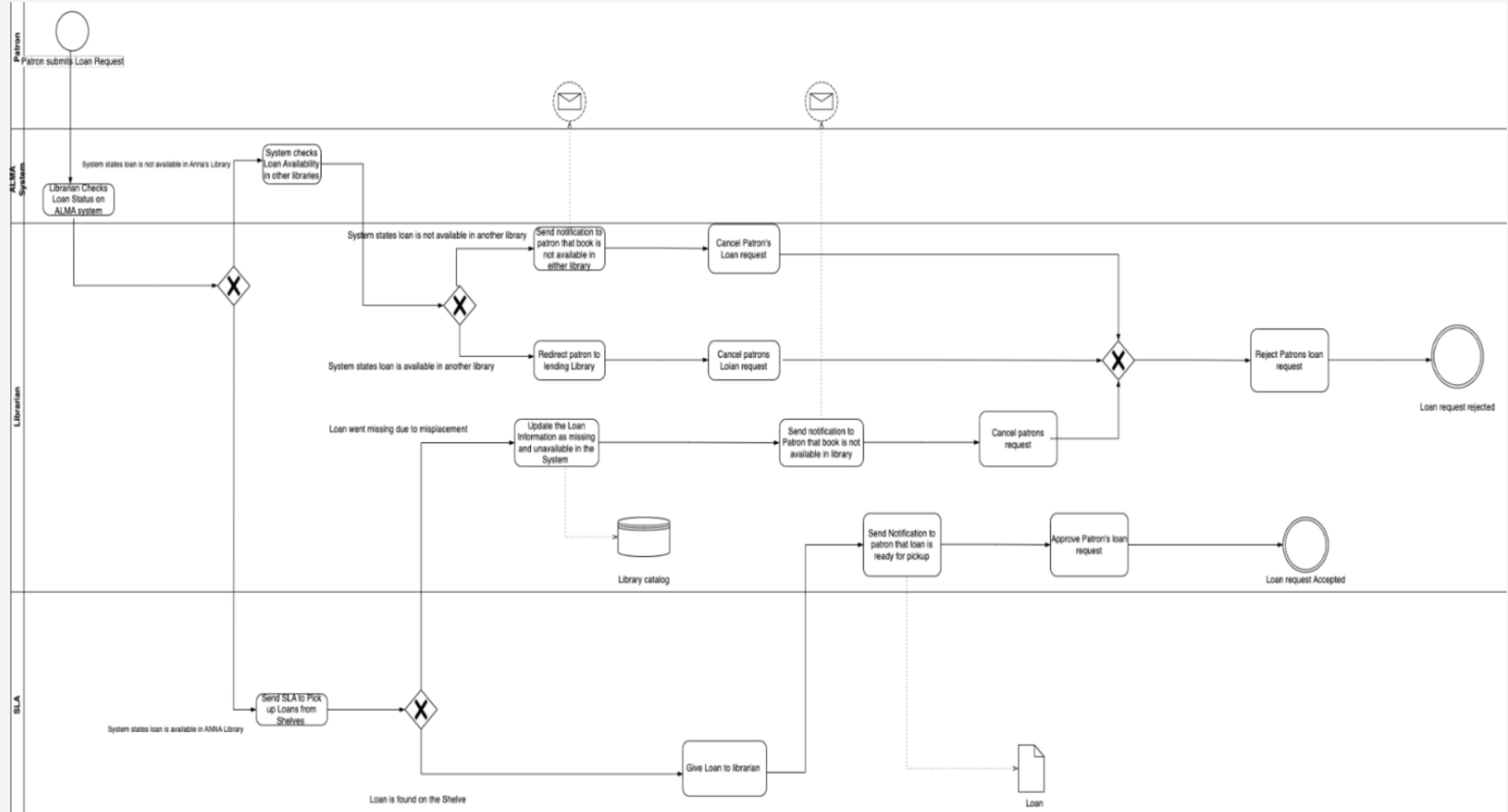
- misplacement of materials
- rejection of requests due to missing physical copies
- inefficiencies in searching for material availability



BPMN

AS-IS ANALYSIS

Analysis using BPMN-As is





BPMN TO-BE ANALYSIS

AUTOMATION	DESCRIPTION	PROS	CONS
Book Drop-off bin with barcode scanner	<ul style="list-style-type: none">-Return books, and scan barcode-To record of book being returned	Cuts out time + Labour	Maintenance
Self-Service Portal for Patrons	Patrons check material availability at any time	Reduce Librarian workload	Troubleshoots if system ever goes down
Predictive Maintenance for Library Equipment	IoT + Machine Learning for predictive maintenance of library equipment	Reduce downtime for fault equipment	Expensive + Extensive Training

INNOVATION

DESCRIPTION

PROS

CONS

User-Specific
Recommendation
System

- Machine learning to provide personalized recommendations

- Helps Patron discover new material

Privacy concerns,
requires analyzing
patron data

Digital Material
Lending

- Platform for borrowing ebooks, and digital materials

Expands limits of library - diminish physical limit

Licensing cost
Exclusionary to those without access to internet

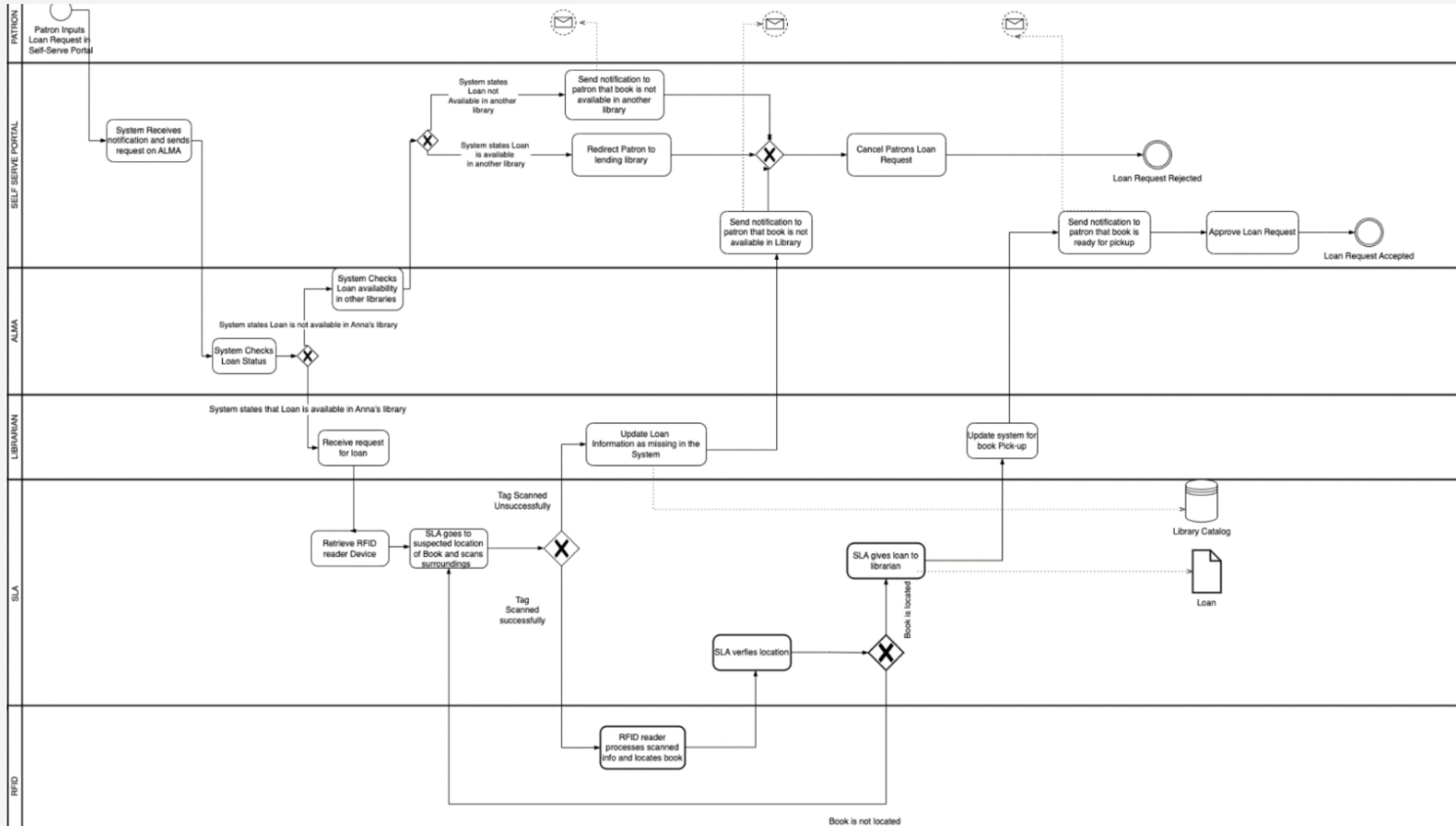
Inventory
Management with
RFID

- Implement RFID technology for automated material tracking

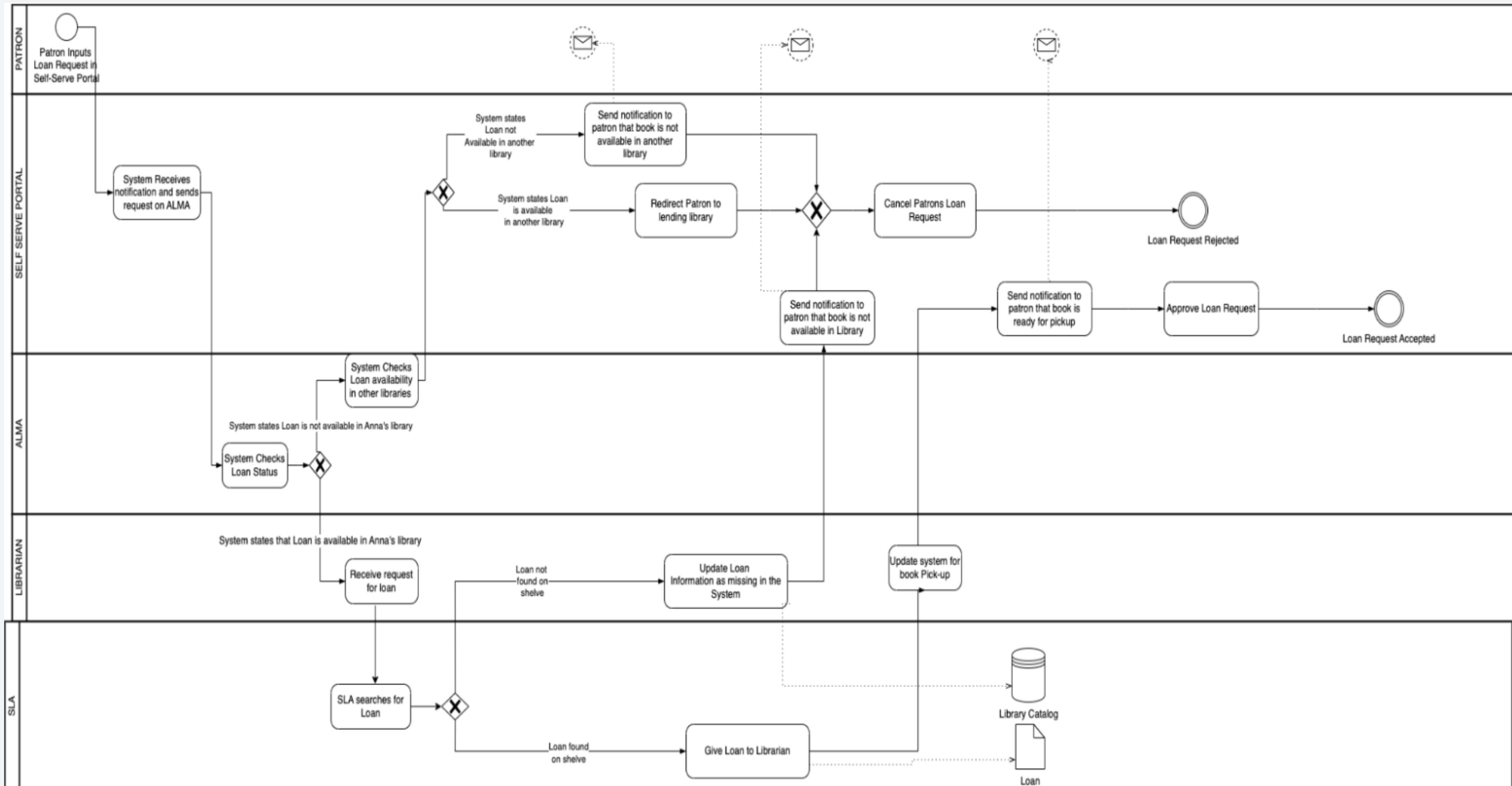
- Automate loan process
- Faster service

Expensive in its upkeep and purchase

Analysis using BPMN-To be (RFID)



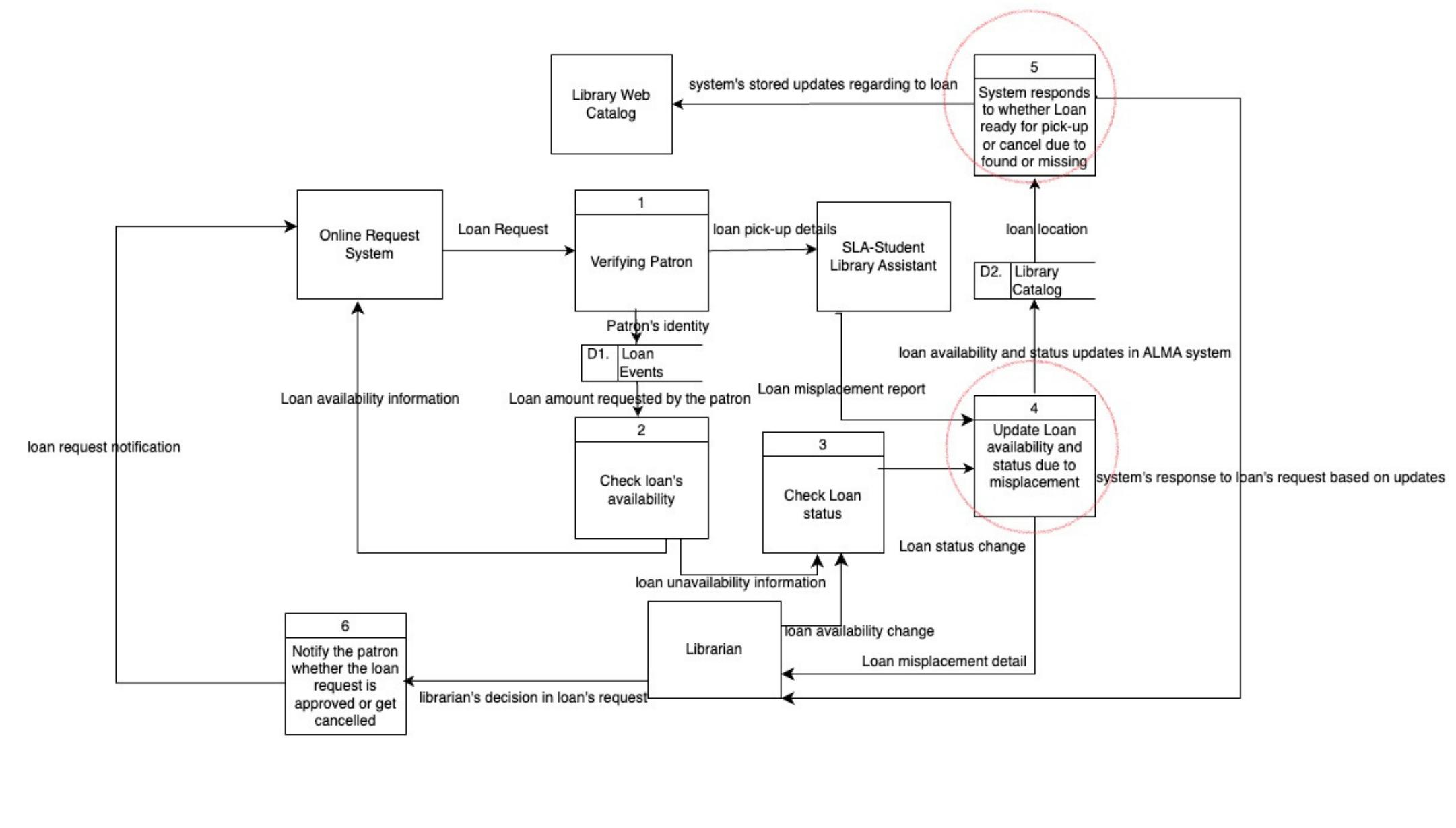
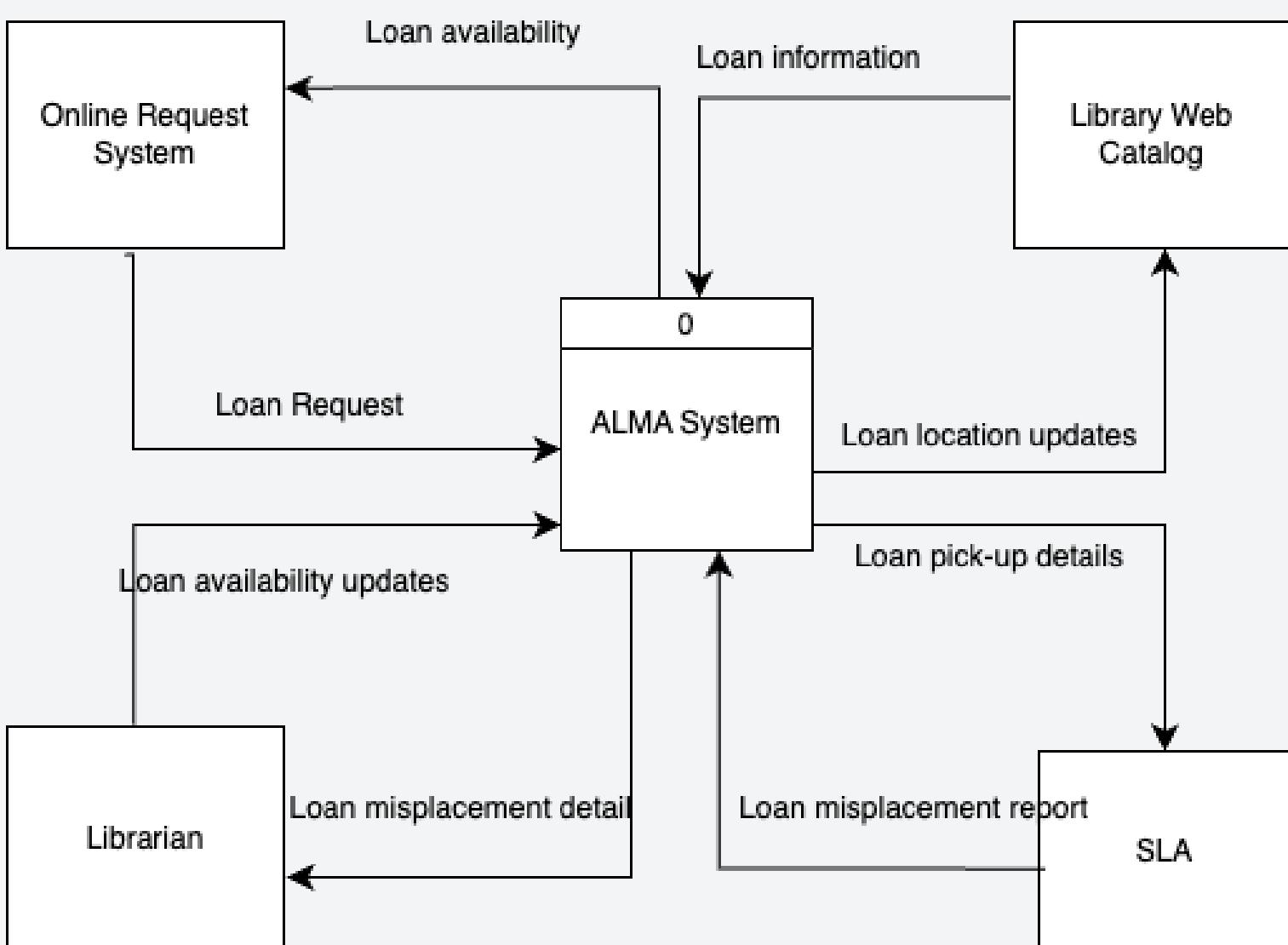
Analysis using BPMN-To be (Self-Service Portal)





DATA FLOW DIAGRAM AS-IS ANALYSIS

Analysis using DFDs-as-is



Loan Processing Workflow Overview

Loan request initiated through the Online Request System.

ALMA System receives loan request data input.

Librarian checks loan availability in ALMA.

Key Steps in Loan Processing

If available, SLA is assigned to pick up the material.

SLA updates pick-up details in ALMA.

If material found, SLA prepares it for patron pick-up.

Exceptions Handling and ALMA System as Core

Misplacement of requested books:

- SLA reports misplacement to ALMA.
- Librarian receives misplacement details, cancels loan request.
- Updates recorded in real-time in Library Web Catalog.

ALMA is the central system for loan processing.

- All data inputs pass through ALMA.
- Entities interact with ALMA during loan processing.
- System responds to whether loan request is cancel or ready for pick up based on the location update through library catalog

- Librarian holds the final authority in whether approving the request or canceling after receiving the system's response



DATA FLOW DIAGRAM TO-BE ANALYSIS

AUTOMATION	DESCRIPTION	PROS	CONS
Enable Patron's access to ALMA Platform UI	Grant patron partial access to librarian-only search portal	<ul style="list-style-type: none"> • access to material available • Improve efficiency 	Cost to revamp a part of AMLA system user interface
Convert popular materials into softcopy	Convert popular item into softcopy accessible to patron on-site at Anna Library	Improve bottleneck of popular material	<ul style="list-style-type: none"> • Time cost to convert materials into soft copy • Copy Rights
Regression Analysis on Factors of Misplacement	Insights on factors of misplacement for potential preventive policy	Ability to diagnose and prevent misplacement incident	Requires librarian to learn how to use R-studio (Free)

INNOVATION

DESCRIPTION

PROS

CONS

Inter-Library
Internal Transfer
System

Check availability of material in libraries under the same system

Improve transparency of material

- Costly
- Challenging misplacement investigation

Regular RFID
Sanity Check

Implement RFID to materials identified as high risk item with regular sanity check

Reduction of human errors

Costly to implement RFID within library

Recommendation
on contingency

Based on AI, make recommendations when material is not available

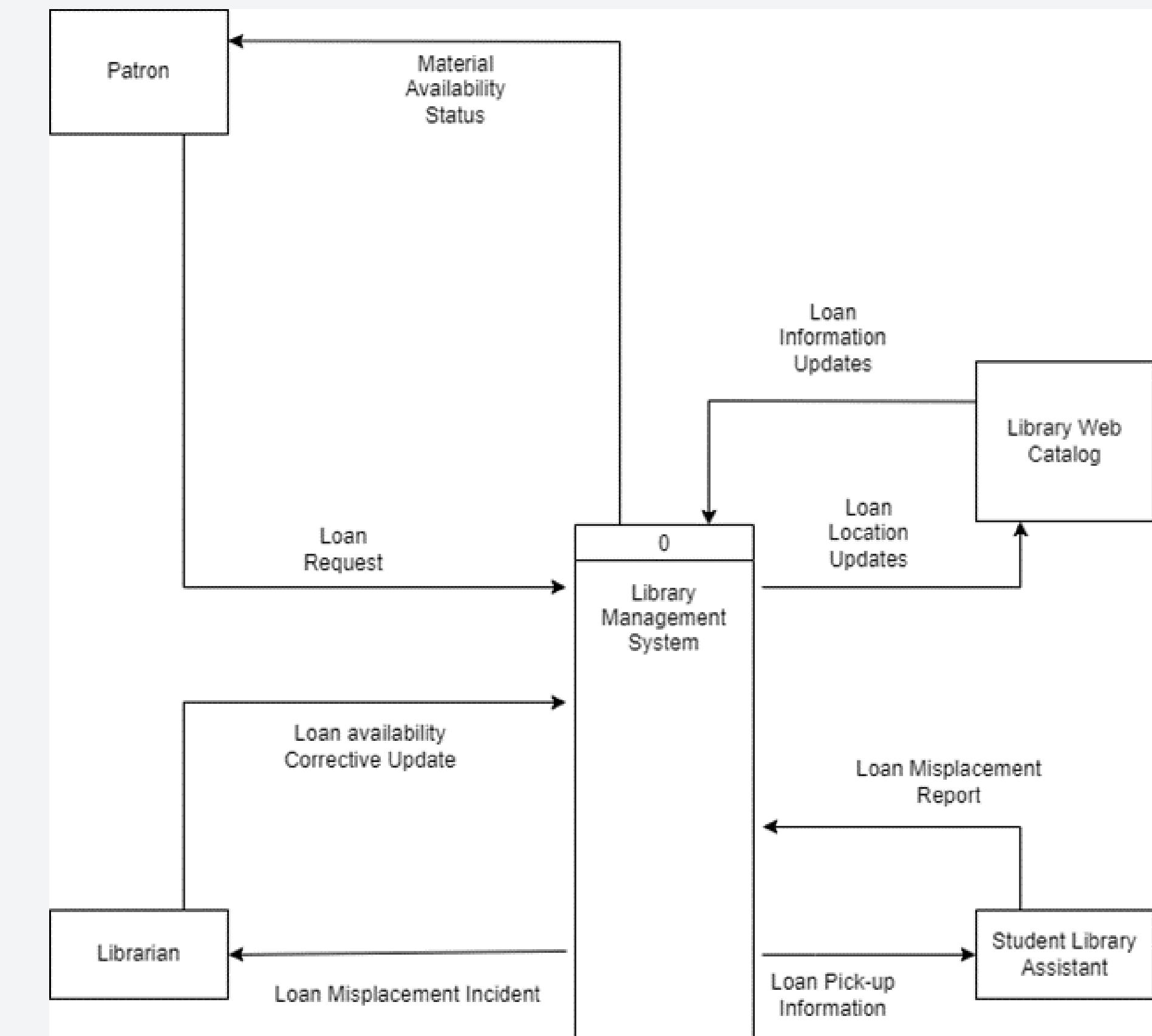
Provide patrons with more options under difficult situation

Costly to implement machine learning and AI

To-be Analysis using DFDs: Patron UI Enablement

Context Diagram

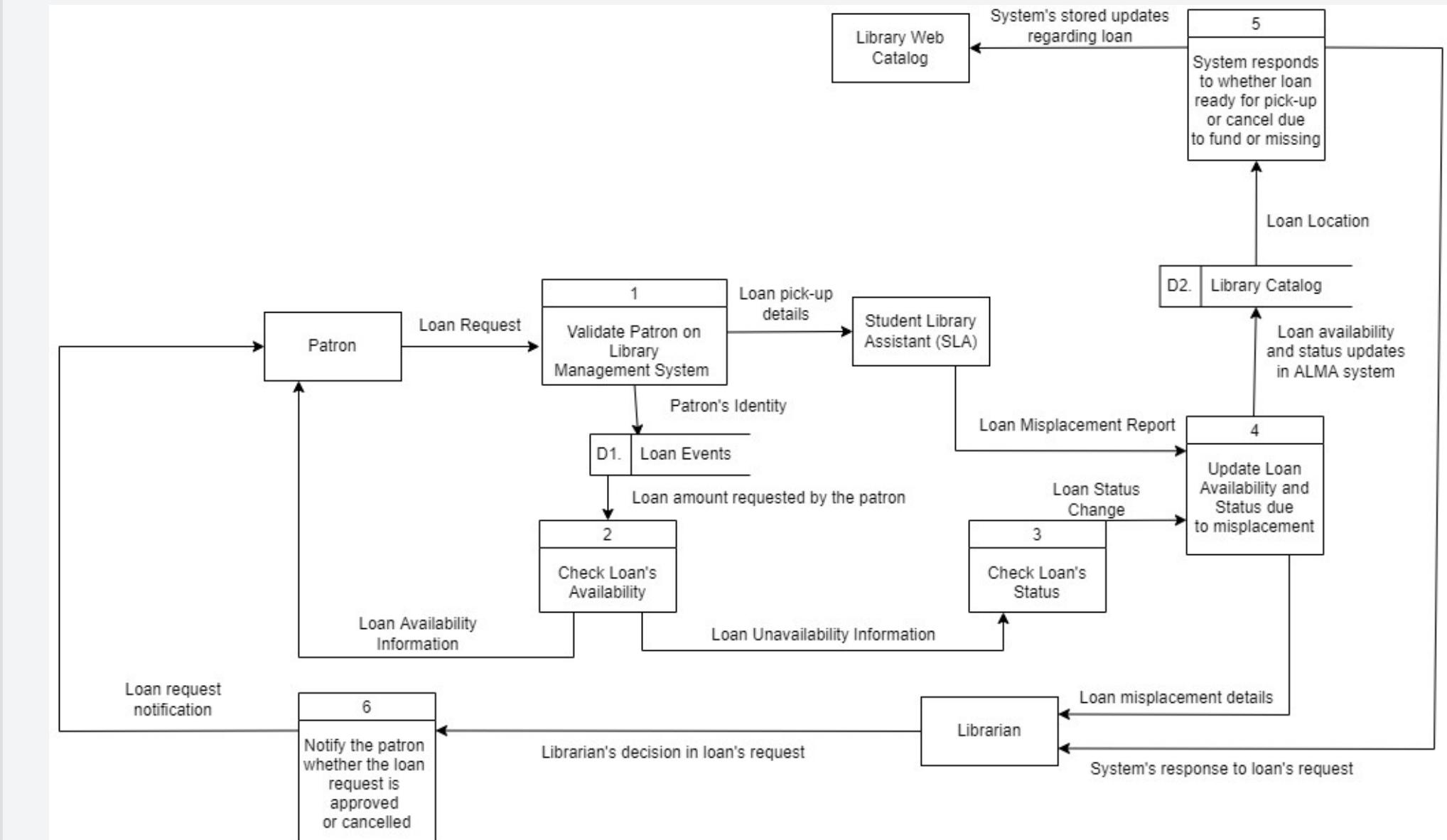
- Major change = Replacement of “Online Request System” to “Patron”
- Renamed “ALMA Platform” to “Library Management System”
- Enable self-service book request and availability query
- Reduces workload of library staff in handling loan requests



To-be Analysis using DFDs: Patron UI Enablement

Level 0 Diagram

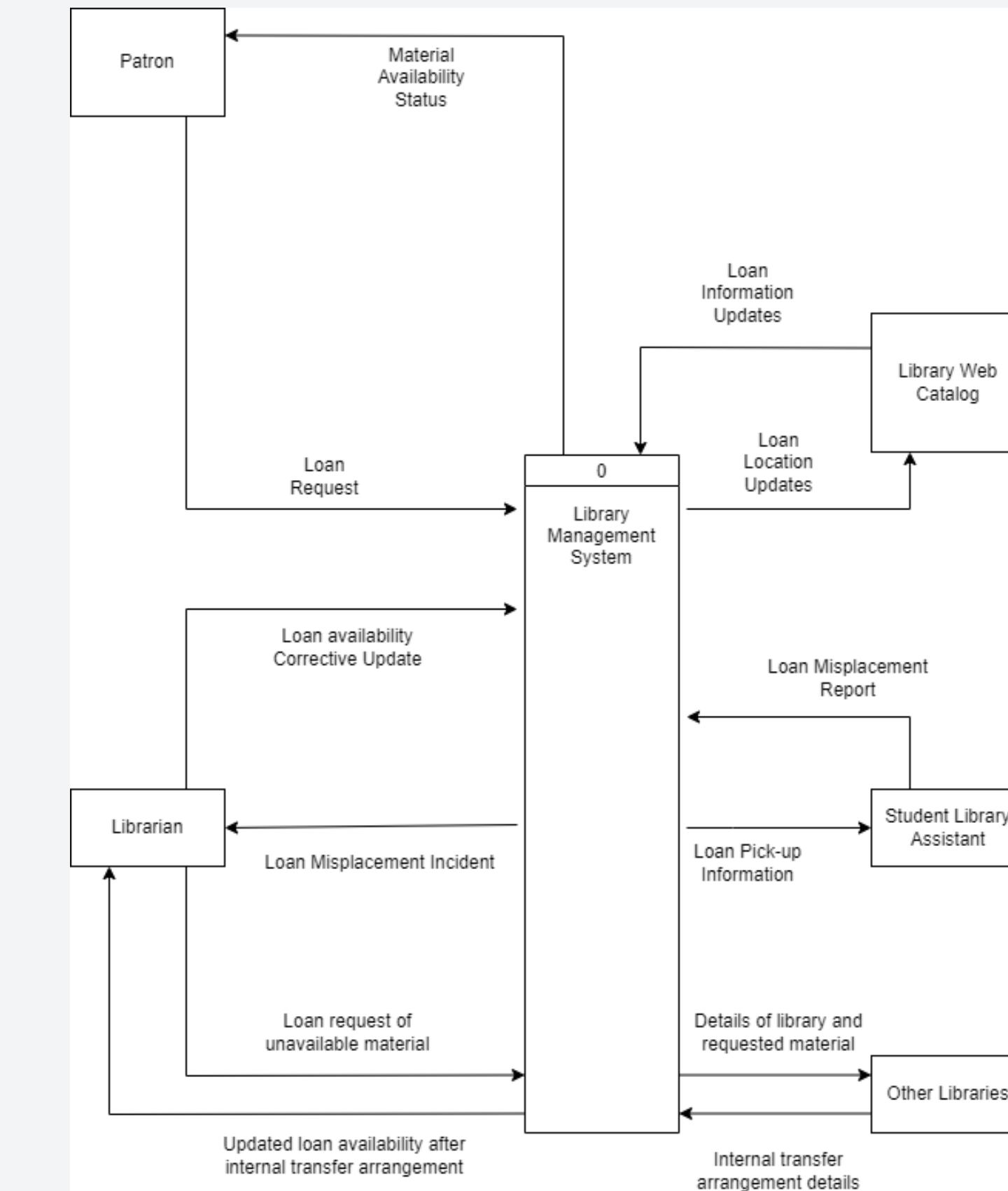
- Major change = Replacement of “Online Request System” to “Patron”
- Renamed “ALMA Platform” to “Library Management System”
- Patron verification performed by Library Management System
- Data Store and Data Flow Largely remained unchanged (both Data type and process)



To-be Analysis using DFDs: Inter-Library Transfer

Context Diagram

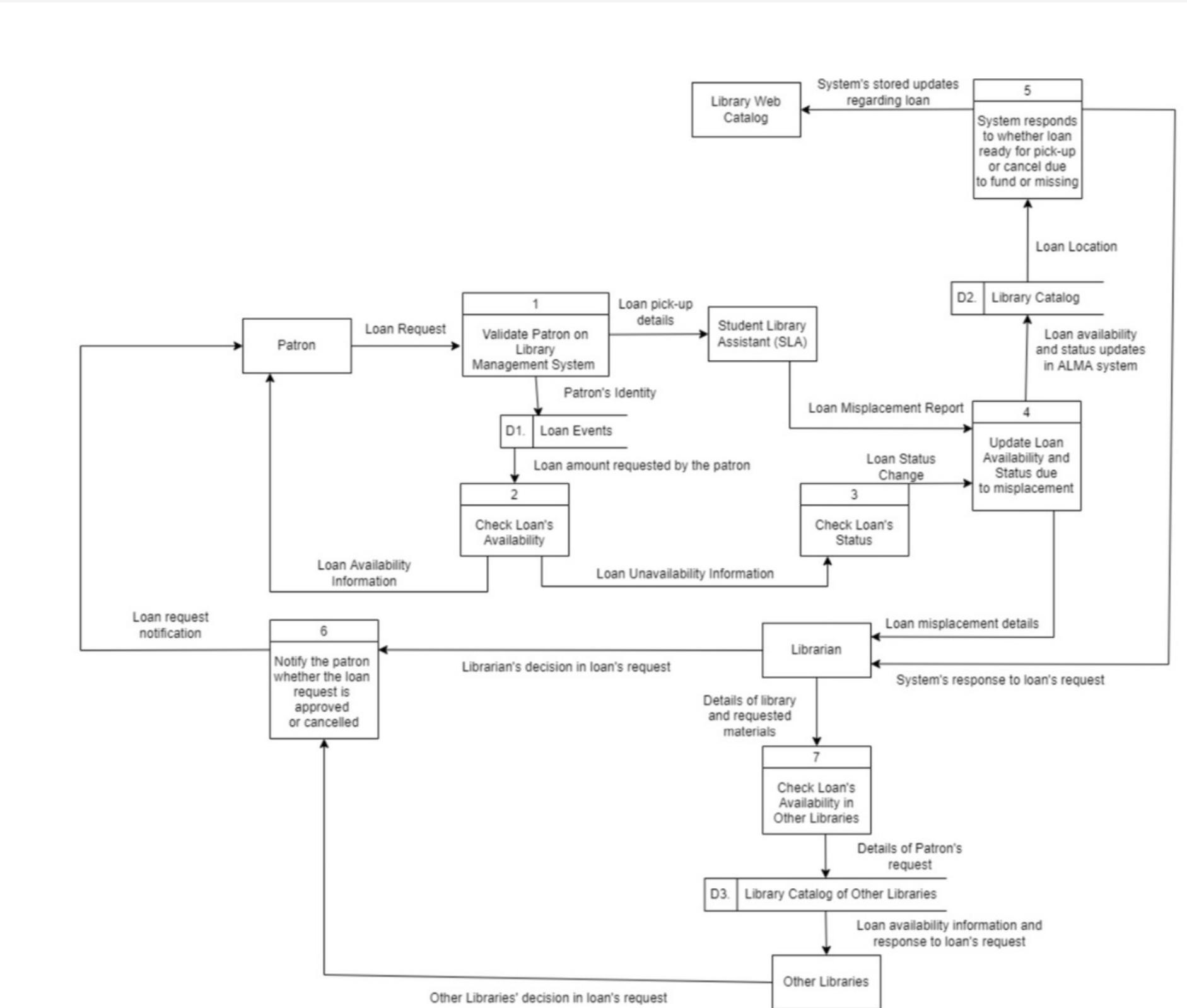
- Major change = added extra entity “Other Libraries”
- Renamed “ALMA Platform” to “Library Management System”
- Librarian could check availability and request transfer via LMS if material is available in other libraries
- Other Libraries would return transfer arrangements and approval via LMS

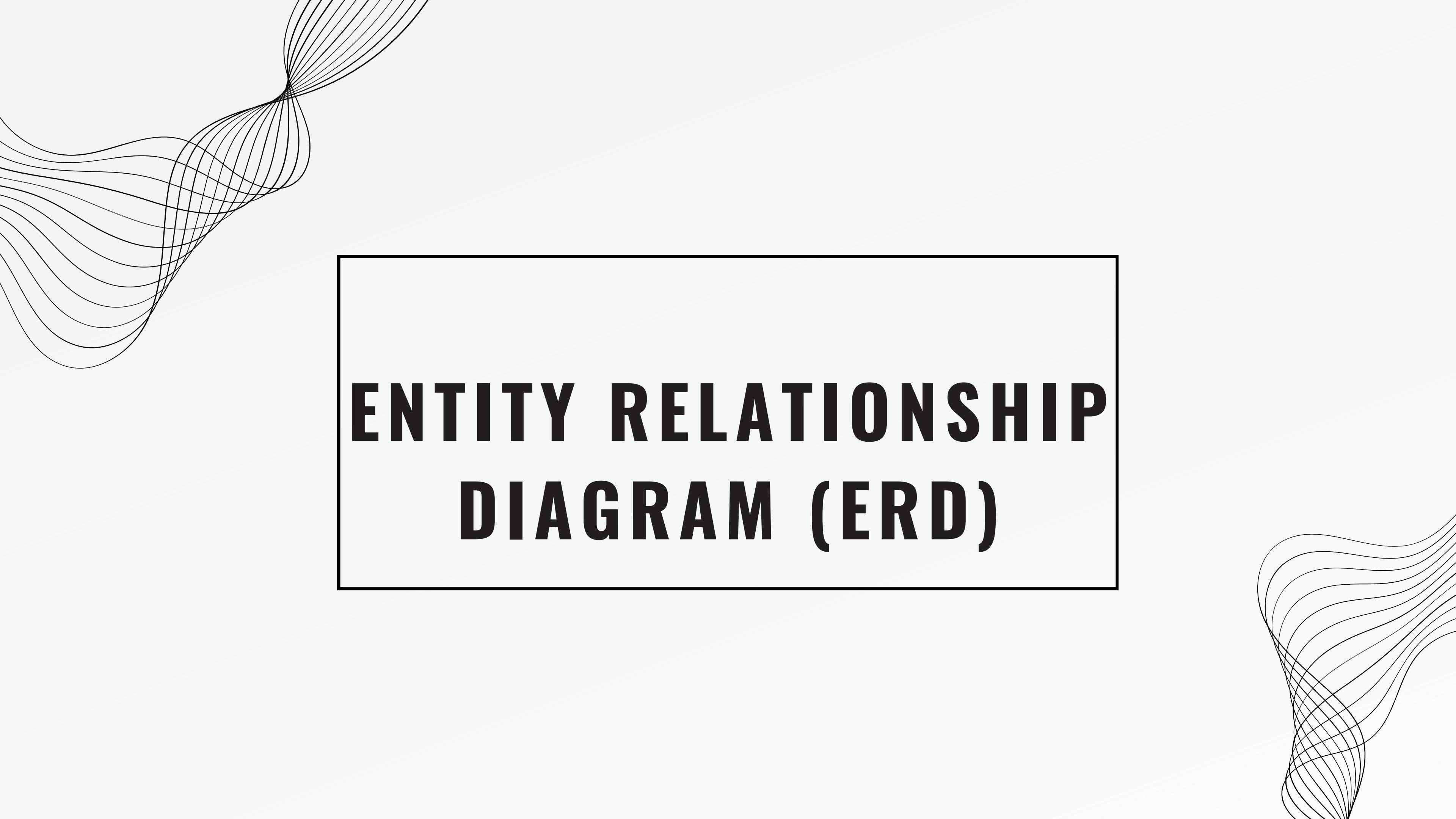


To-be Analysis using DFDs: Inter-Library Transfer

Level 0 Diagram

- Major change = Added extra entity “Other Libraries”, extra Data Store “Library Catalog of Other Libraries”, and extra process “check loan’s availability in other libraries”
- Allows patron to access material in case of absence or misplacement of material in Anna Library
 - Data type in query remained.
 - Connection to other data store.

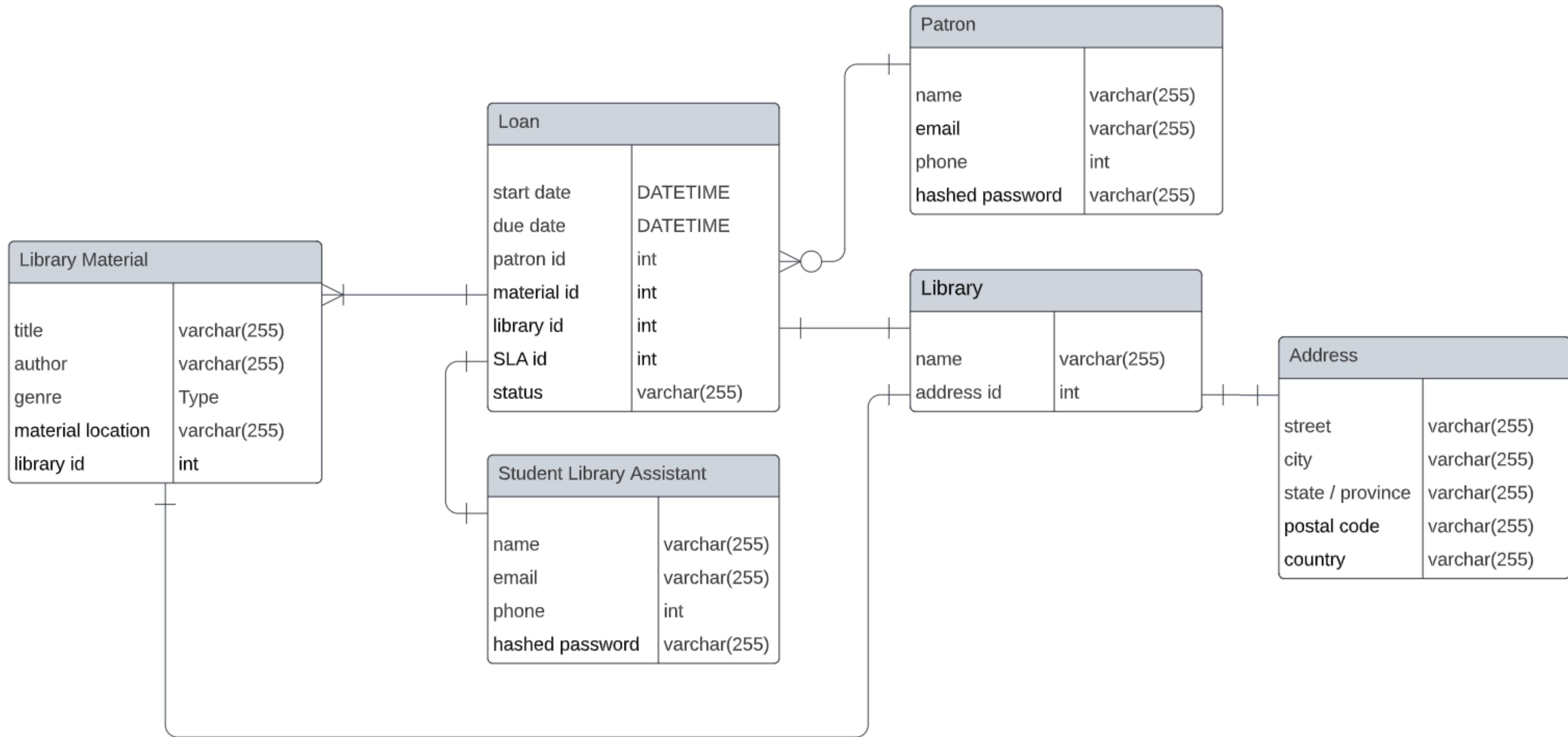




ENTITY RELATIONSHIP DIAGRAM (ERD)

Anna Library Status Quo ER Diagram

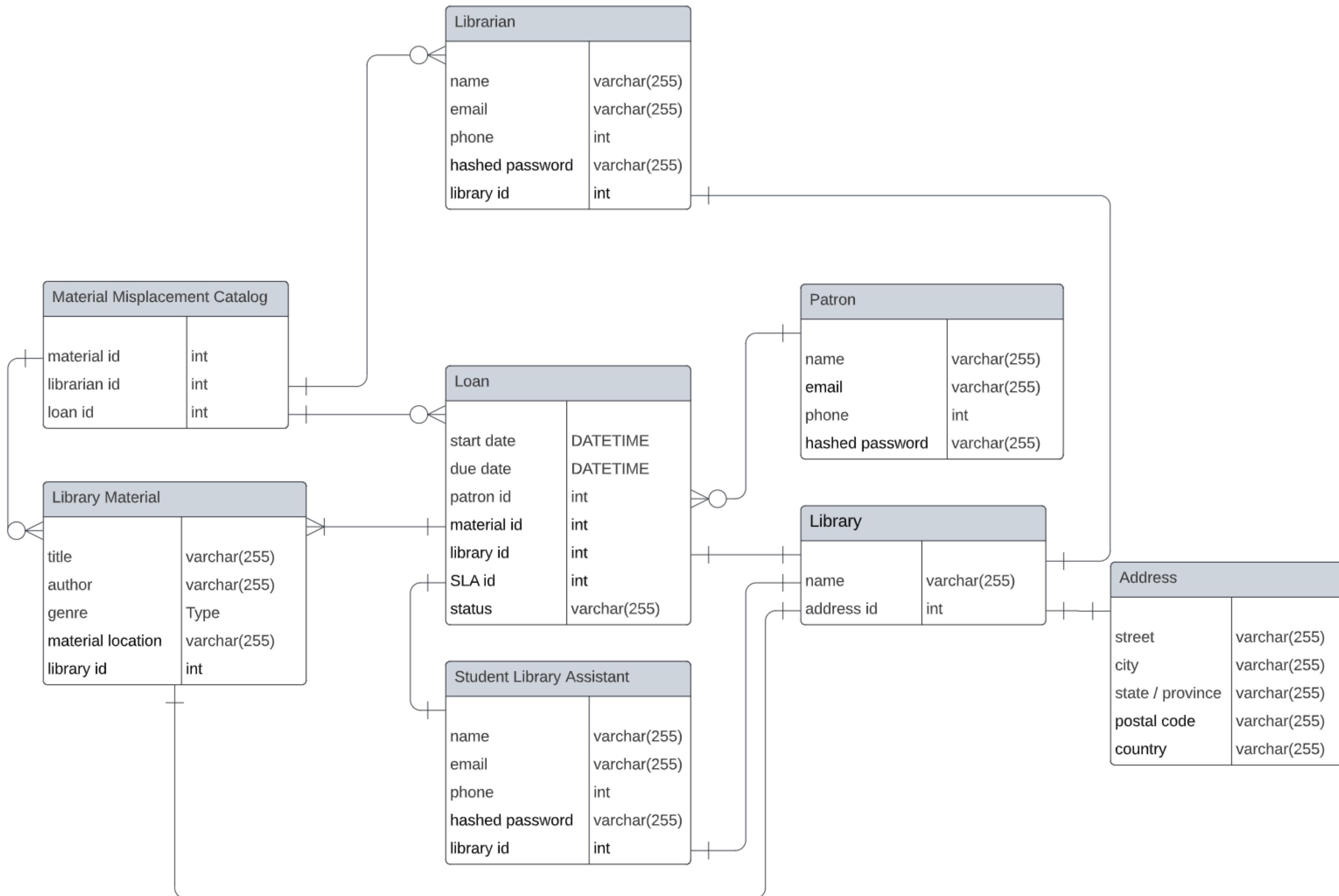
HenryZhang | November 15, 2023



Anna Library To-be Automation ER Diagram

HenryZhang | November 15, 2023

Enable patron's access and user-interface to ALMA platform





COMPARISON BETWEEN BPMN & DFD

Comparison DFD VS. BPMN

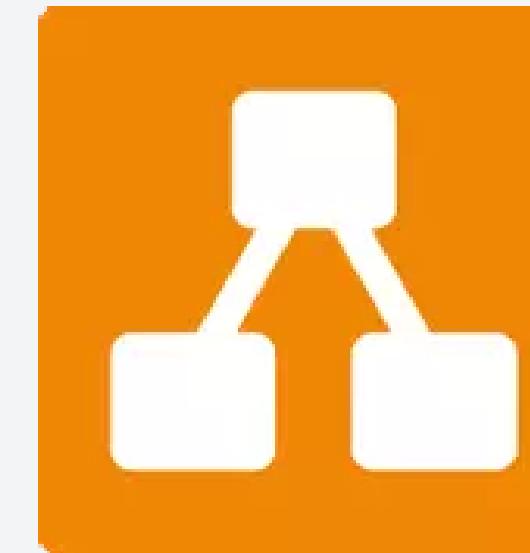
- **BPMN specific Insights into the loan process**
- **DFD specific Insights into loan process**

DFD	BPMN
<ul style="list-style-type: none">• Provides high level understanding of data flows• More Granular• Doesn't follow chronological order and denotes temporality• Intended audience would be those with more technical knowledge	<ul style="list-style-type: none">• Displays business processes at a high level• Follows a semi-chronological logic• Intended audience is wide range of Stake holders• utilizes Standardized notation

Methods, Activities, and Tools Used



Interviews



draw.io



Case Study



Lucidchart

Constructed Entity Relationship Diagram



THE END