Case Study #3

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GROCECOLL

GROCECOLL

- Grocery collection service
- Allows customers to create shopping lists that get collected and delivered by GroceColl's employees
- Available world-wide

GROCECOLL

- Employees have dedicated tablets displaying the list
- We need to design the collection side of the system
    - The customer side is already developed

Requirements

Functional

What the system should do

1. Web Based
2. Tablets receive list to be collected
3. Employees can mark items as collected or unavailable
4. When collection is done, the list should be transferred to payment engine
5. Offline support is a must

Non-Functional

What the system should deal with

NFR - What We Ask

1. *"How many expected concurrent users?"* — 200
2. *"How many lists will be processed per day?"* — 10,000
3. *"What is the average size of a shopping list?"* — 500KB

NFR - What We Ask

4. *"Do we need offline support?"* — Yes!

5. *"What is the desired SLA?"* — Highest Possible

6. *"How do lists arrive to the system?"* — Queue

Data Volume

- 1 List = 500KB
- 10,000 lists / day = 5GB / day

  => ~2TB / year

Requirements

Functional

What the system should do

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Non-Functional

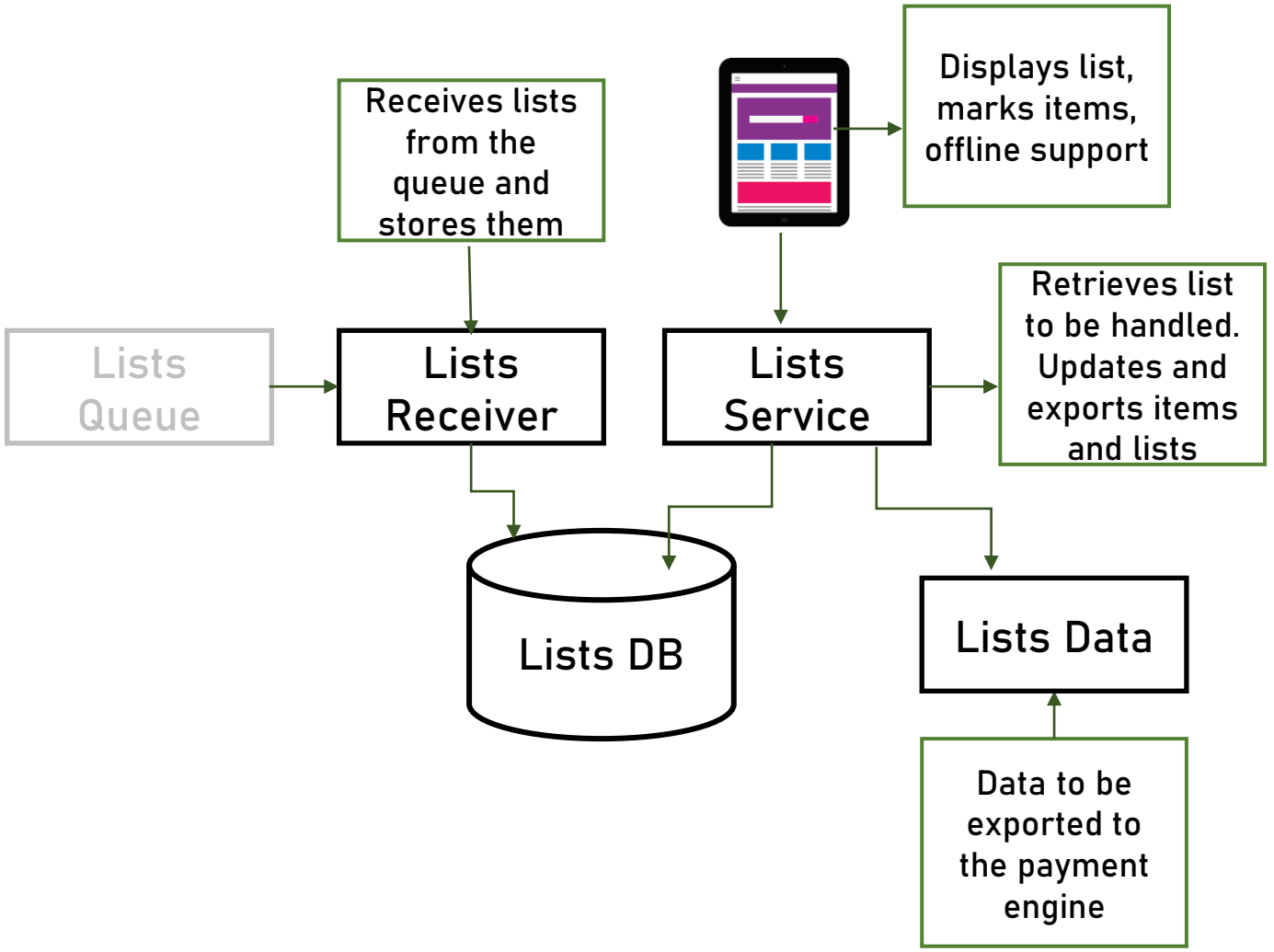
What the system should deal with

1. 200 Concurrent users
2. 10,000 lists/day
3. Yearly volume: 2TB
4. High SLA
5. Offline support

Components

Based on requirements:

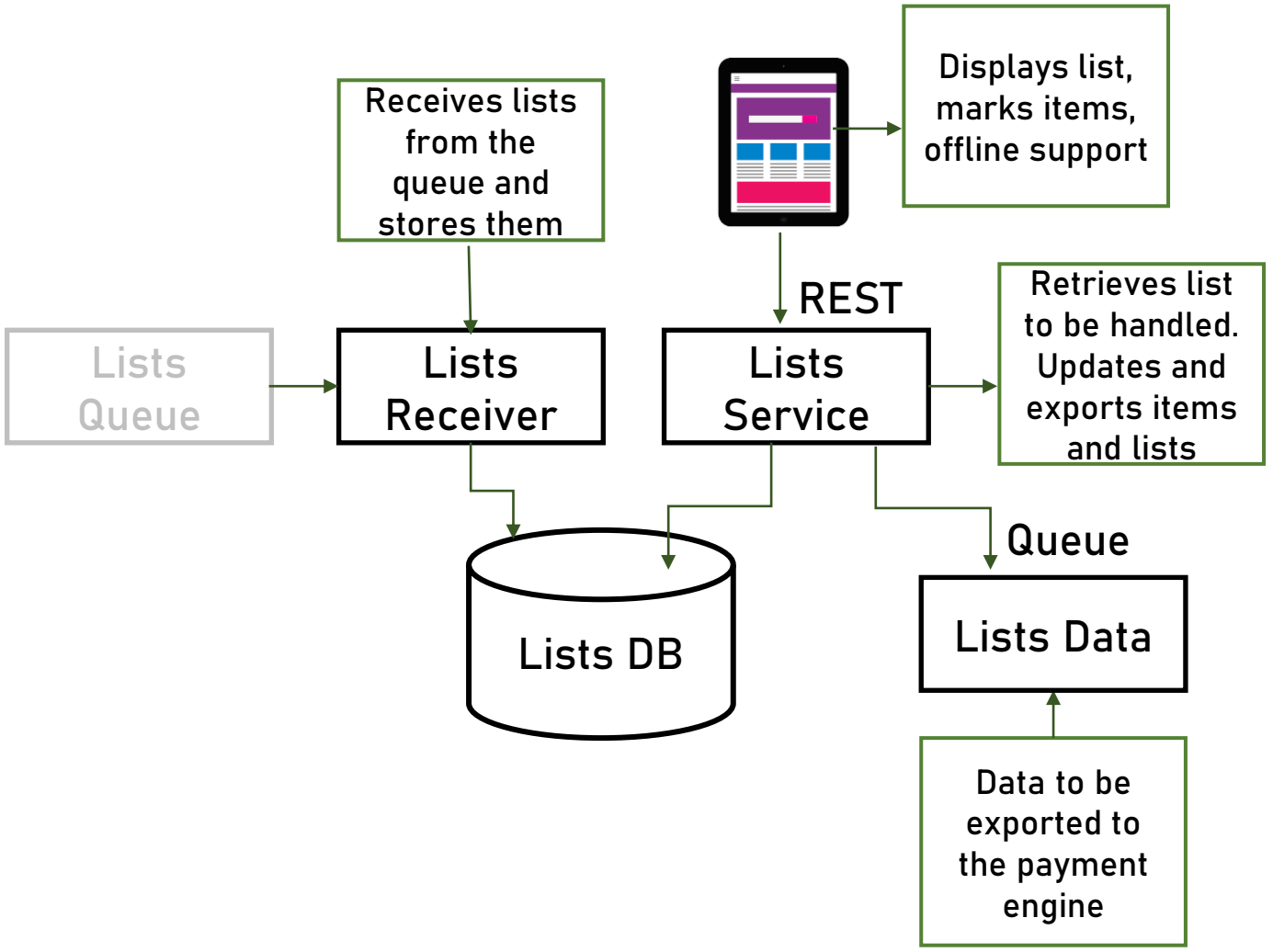
1. Employees have tablets
2. Offline support
3. Retrieve lists
4. Mark Items
5. Export list to payment engine



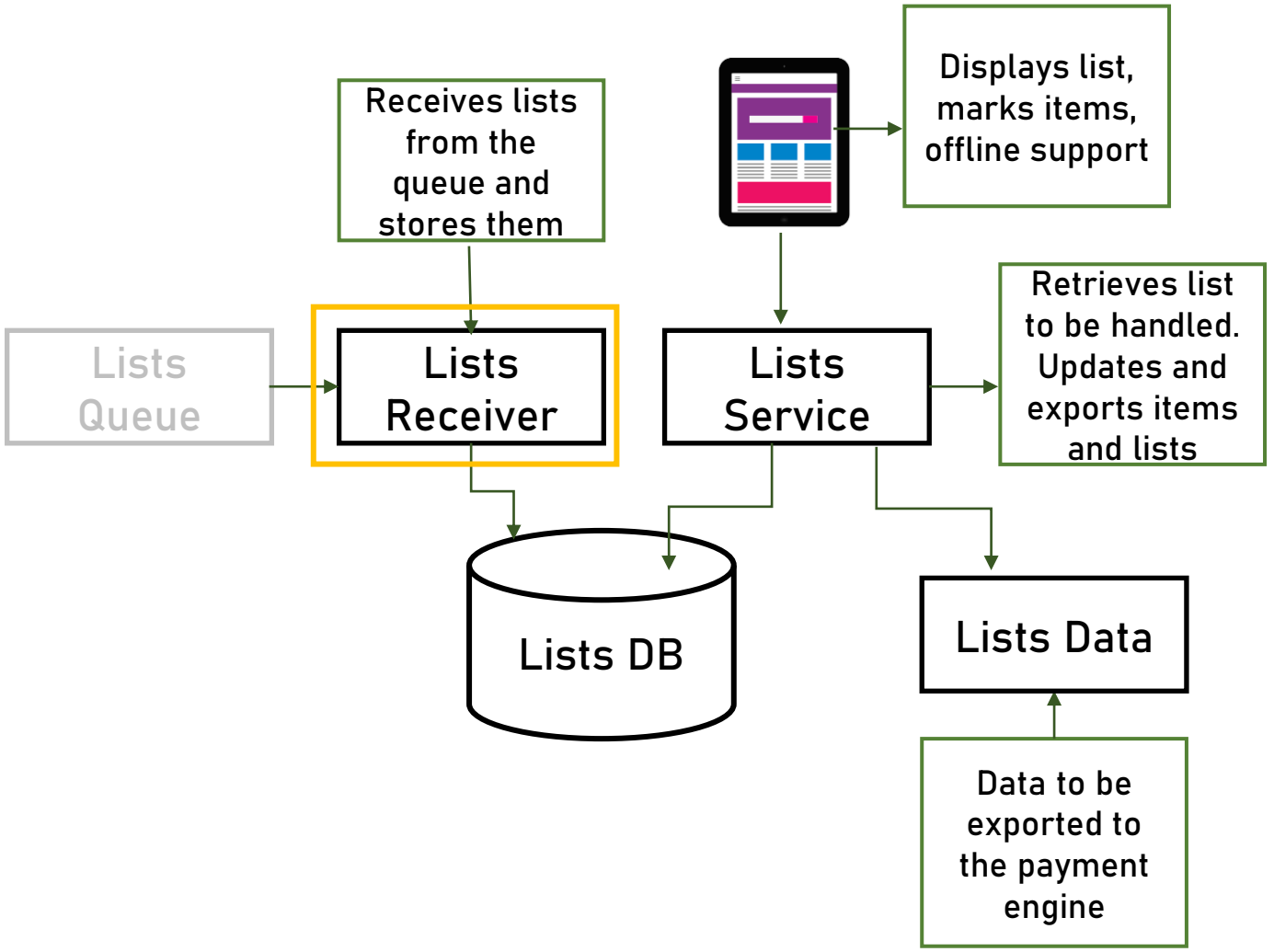
Messaging

Based on requirements:

1. Employees have tablets
2. Offline support
3. Retrieve lists
4. Mark Items
5. Export list to payment engine



Components


Receives lists from the queue and stores them
Displays list, marks items, offline support
Lists Queue
Lists Receiver
Lists Service
Retrieves list to be handled. Updates and exports items and lists
Lists DB
Lists Data
Data to be exported to the payment engine

Lists Receiver

What it does:

- Receives shopping lists to be handled from queue

- Stores the lists in the datastore

Application Type

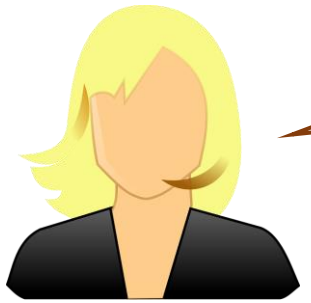
- Web App & Web API ✗
- Mobile App ✗
- Console ✓
- Service ✓
- Desktop App ✗

Technology Stack

Considerations:

- Should be able to connect to queue
- Not much else…

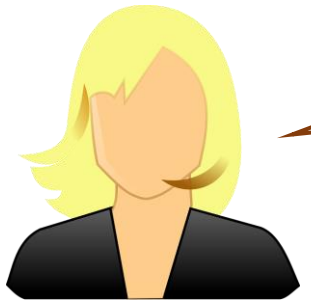
Technology Stack



We're basically a Java shop, and our database of choice is MySQL.

Java is a perfect fit for this task, so we'll go with it.

Technology Stack



We're basically a Java shop, and our database of choice is MySQL.

What about database?

- Our data is relational, and MySQL is a relational DB
- Expected volume is 2TB/Year which is a lot
  - But can utilize partitioning
  - So…

Technology Stack

Architecture

Queue Receiver

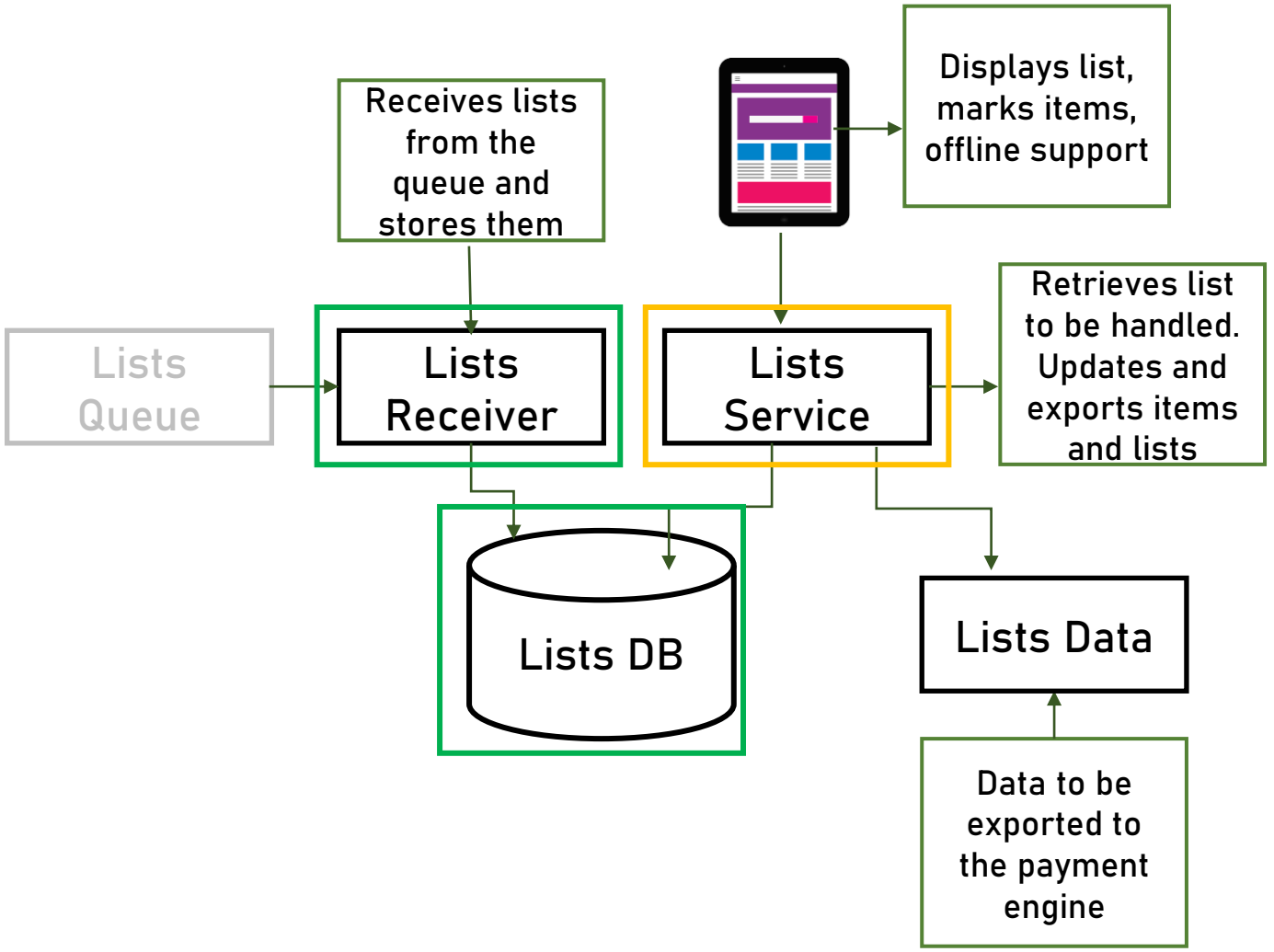
Business Logic

Data Access

Lists Receiver Redundancy

Consumer Group

Components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Lists Service

What it does:

- Allows employees to query lists

- Marks items in list

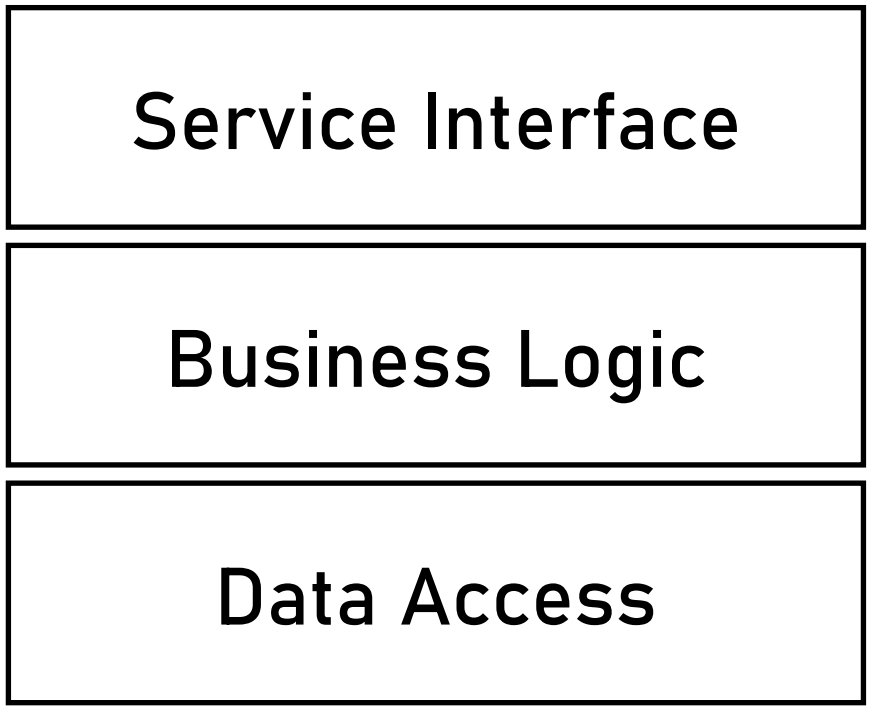
- Exports payment data

Application Type

- Web App & Web API ✓
- Mobile App ✗
- Console ✗
- Service ✗
- Desktop App ✗

Technology Stack

Architecture



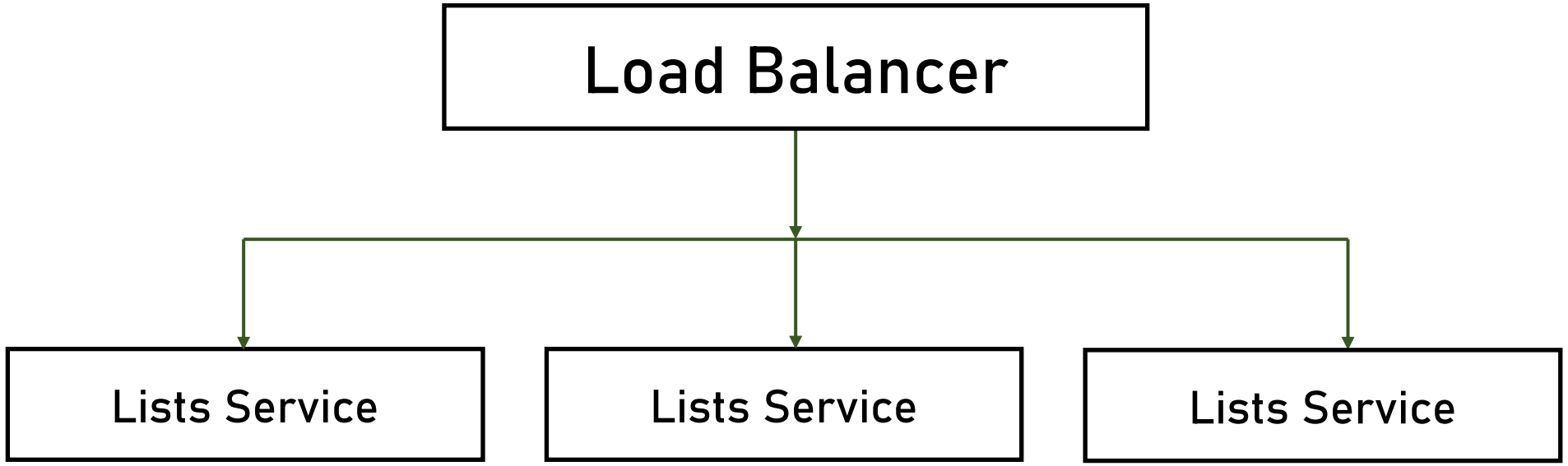
API

- Get next list to be processed (by location)
- Mark item as collected / unavailable
- Export list's payment data

API

Functionality	Path	Return Codes
Get next list to be processed	`GET /api/v1/lists/next?location=…`	`200 OK` `400 Bad Request`
Mark item as collected / unavailable	`PUT /api/v1/list/{listId}/item/{itemId}`	`200 OK` `404 Not Found`
Export list's payment data	`POST /api/v1/list/{listId}/export`	`200 Ok` `404 Not Found`

Lists Service Redundancy



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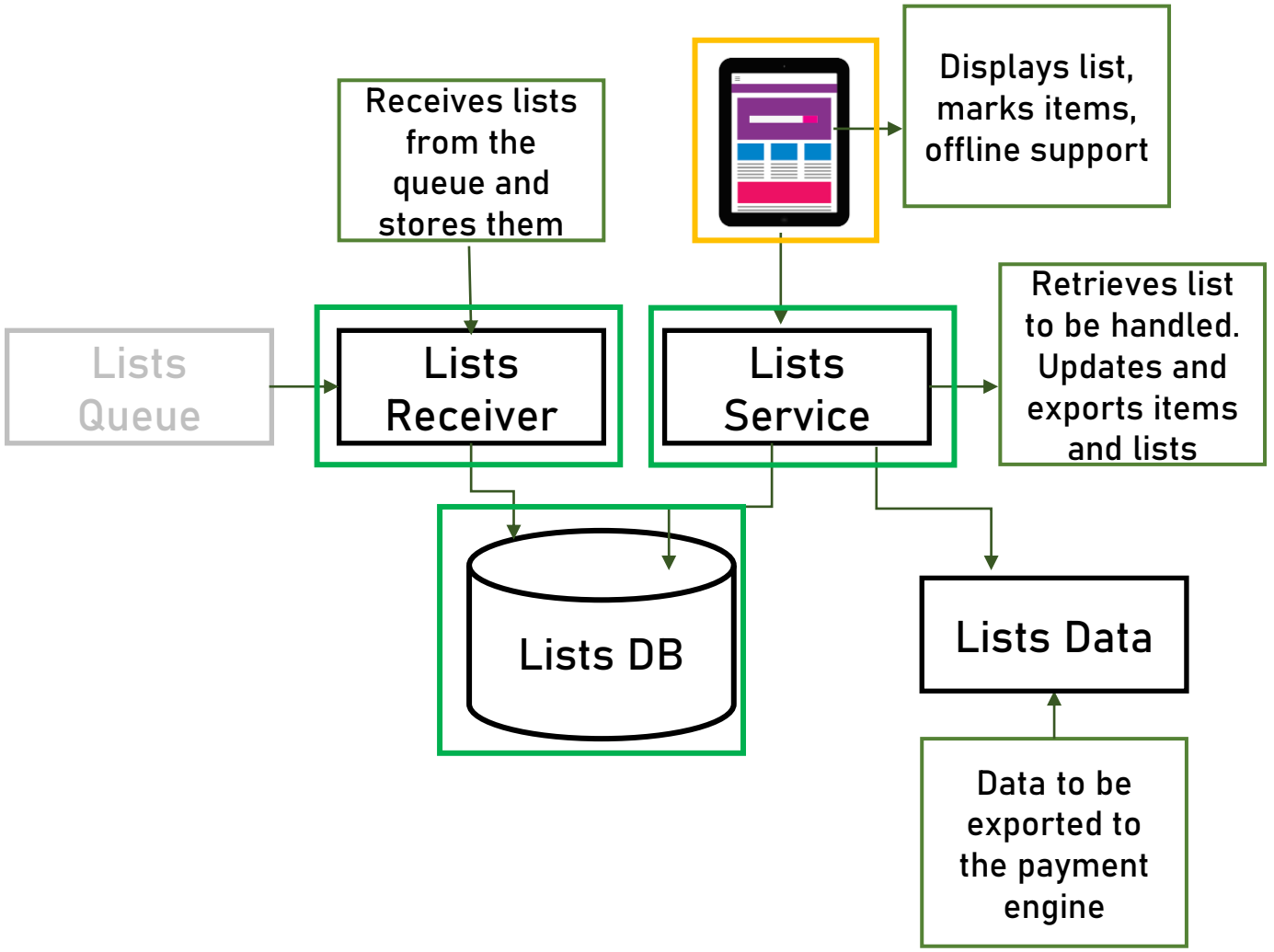
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Front End

What it does:

- Displays shopping list

- Marks items as unavailable / collected

- Sends list to payment system

- Supports offline mode

Application Type

- Web App & Web API ✗
- Mobile App ✓
- Console ✗
- Service ✗
- Desktop App ✓

Technology Stack

Need to decide between:

Desktop, windows based (WPF)

- Supports all OS functionalities
- Utilizes other apps on the machine (ie. DB)
- Requires setup, Windows

Web based (Electron, React Native)

- Limited functionality
- Cannot use other apps
- Fully compatible with other form factors (phones, etc.)
- No setup required
- Cheaper hardware

Technology Stack

Need to decide between:

Web based (Electron, React Native)

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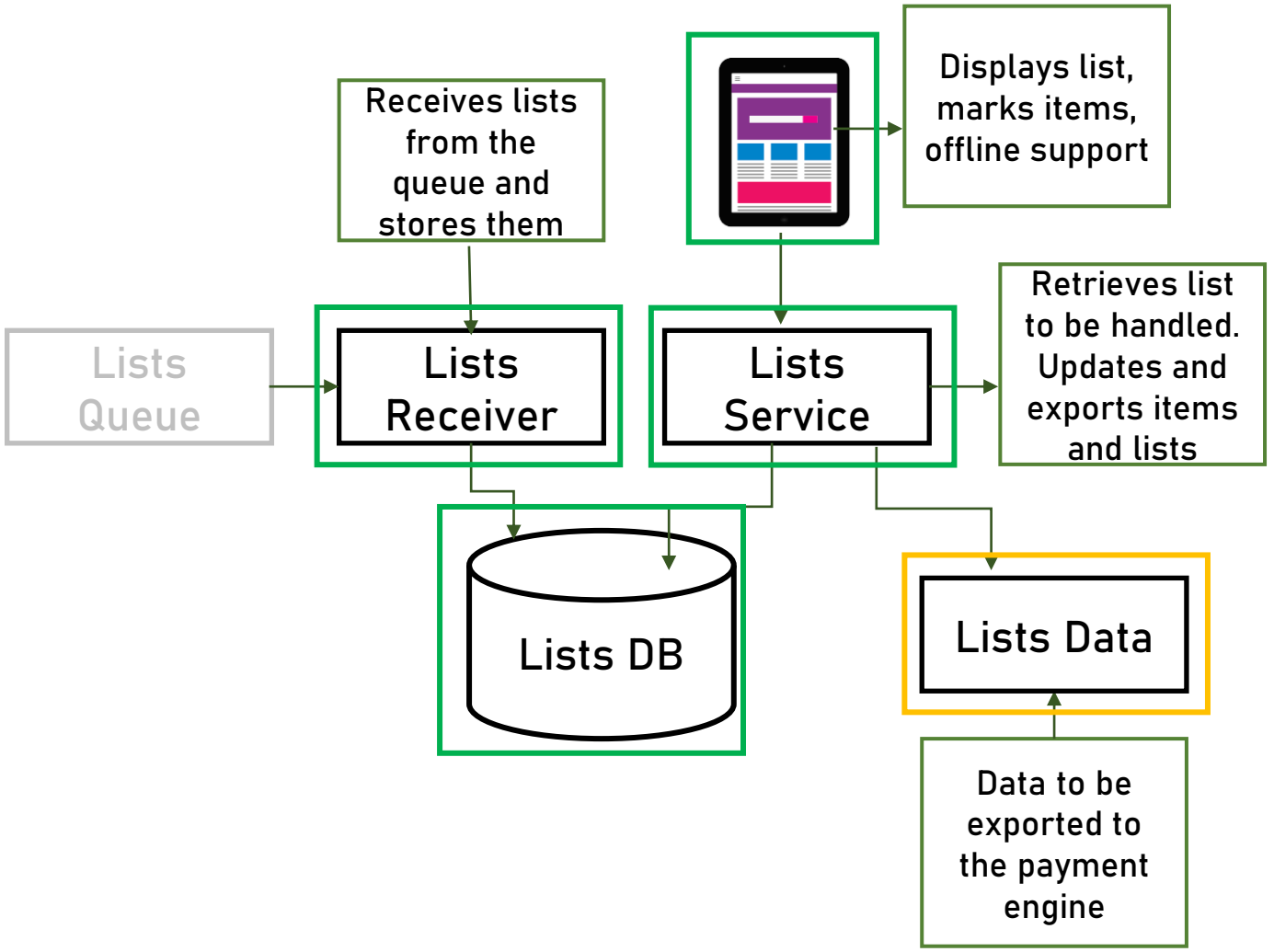
Front End Redundancy

Not Relevant…

Components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Export Lists Data

What it does:

- Used to send shopping lists' data to payment system

- Basically – a queue

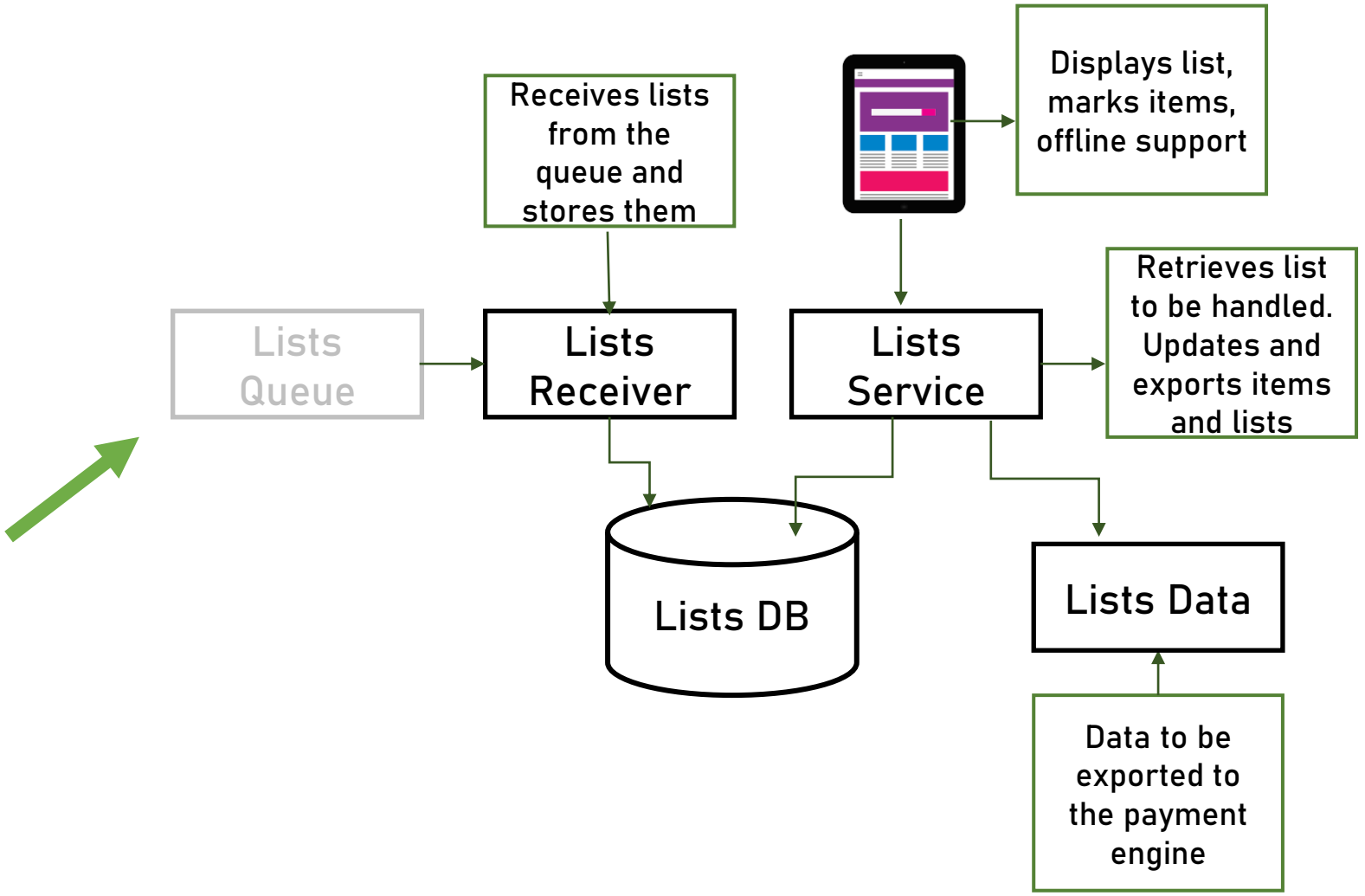
Export Lists Data- Questions

1. Is there an existing queue mechanism in the company?

   Yes

2. Develop our own or use 3rd party?

Components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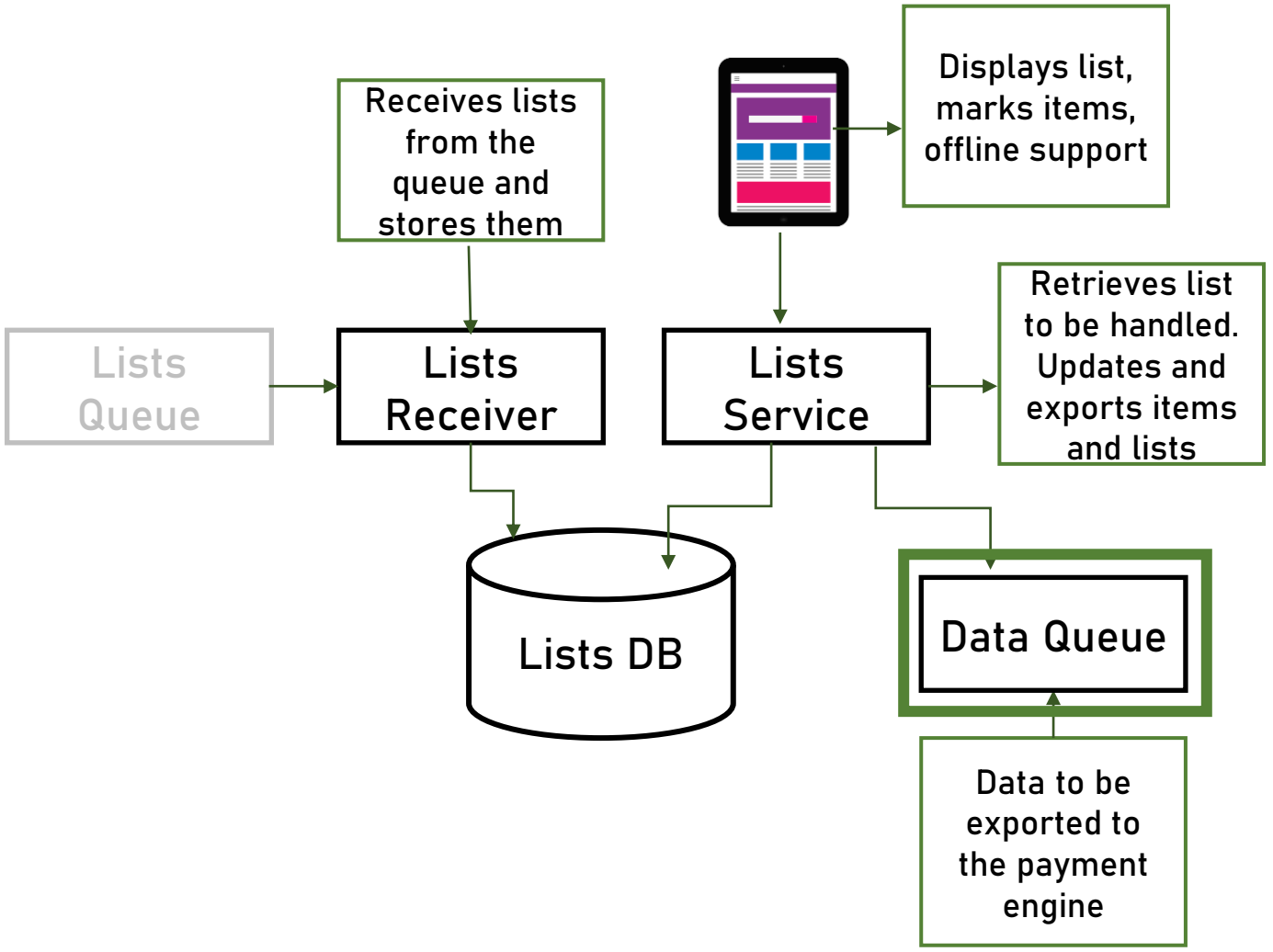
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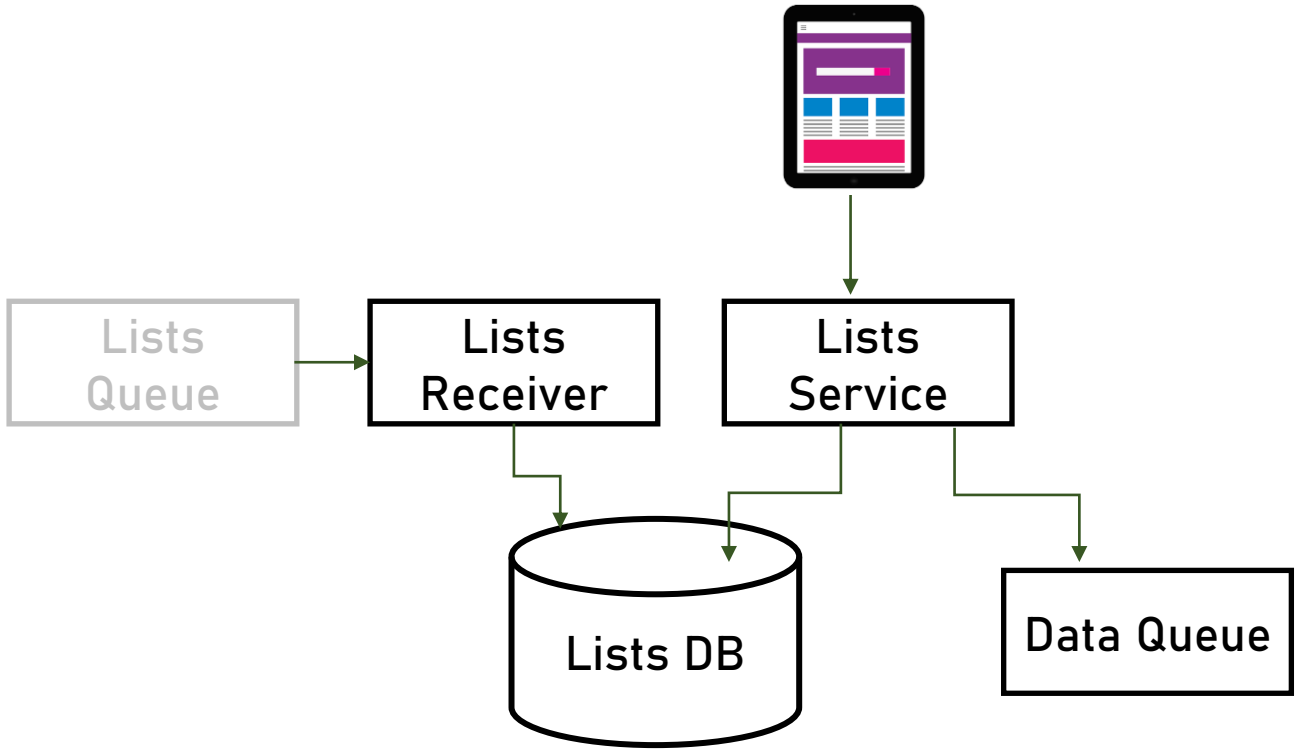
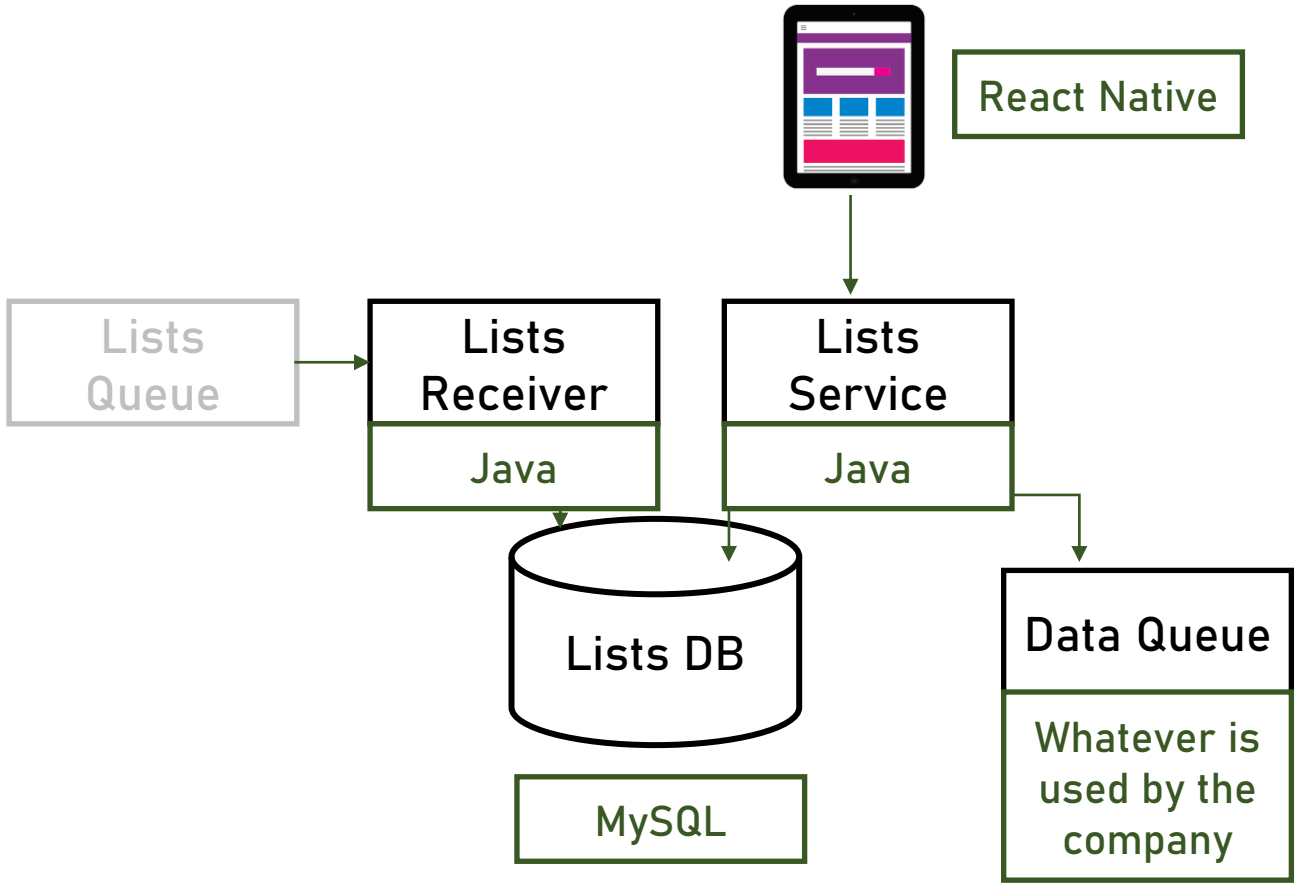
Logic Diagram



Technical Diagram



Physical Diagram