ILARA HEALTH

# ENGINEERING

## Case Study

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We ask that you complete the following case study to understand your specific skills and strengths better. You will have **one (1) week** from the date this assignment is shared to complete it. Additionally, you should be prepared to discuss your assignment during any future interviews. All answers should be done on your own without consultation from others.

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## System Design

One of the most demanded features of an EMR system is a billing and inventory management module.

The product team has carried out research and has found out the following:

1. The facilities would like to associate prescriptions to current inventory levels i.e. If a doctor prescribes Drug X, the following should happen
    a. Indicate the stock levels of drug X
    b. Offer alternatives that match the molecule in drug x, again indicating their stock levels.
2. The facility would like the ability to upload the current inventory and carry out common inventory management tasks such as updating stock counts, removing inventory items etc
3. There are different sets of EMR users e.g. Doctors, Facility owners, nurses, cashiers, pharmacists, lab technicians etc. Some of the users can perform specific actions while others will not have access at all.
4. The system must be robust to failure i.e. minimum downtime from our end, network challenges from our users. Errors in inventory and billing have financial implications and are headaches for accounting teams.
5. The system should be designed in a way to make it easy to change different components based on market feedback and product research.
6. The system should be auditable i.e. it is easy to generate an audit log for our customers and for our own internal analysis.

We would like you to design a system that meets the above requirements. If there are some requirements that are not clear, please feel free to note them down. If you identify other requirements that are not captured in the list above, you are free to add them. We are more interested in the thought process

We are interested in looking at the following:

1. A flowchart explaining the different components and flows of the systems.
2. How to split the work into small tasks for the engineering team.
3. How you prioritize and assign the tasks to different members of the team
4. How to ensure that the system is set up for scale.
5. Ensuring that observability and relevant system performance metrics are put in place and continuously monitored.
6. A summary of decisions that might be in conflict with the initial requirements, or points of clarification that you would like to raise with the product team.

## Technical Skills

Once you have completed the systems design component above, we would like you to build part of the system that you designed. We'd like you to focus on the inventory component of the system only. The system should include user authentication, a user registration screen, an inventory management page, and a simple checkout page. Please submit your code and instructions on how to run in a README file. This could be a link to a repository or a zip file.

Strongly preferred stacks:

- Backend: NodeJS (with Typescript), Spring Boot
- Database: MySQL, PostgreSQL
- Frontend: React (with Typescript)

Minimum requirements:

- User authentication and login
- Two user types
    - Pharmacist (able to manage inventory)
    - Admin (able to manage users and inventory)
- Inventory management (CRUD)
- Simple checkout page that correctly adjusts inventory levels
- Low stock-level notifications. If an inventory level drops below a pre-configured limit, the user should be notified in real-time. Please choose **one** of the following approaches:
    - WebSocket

    - Third-party notification service
    - Email
    - SMS
- Frontend can be simple but must be responsive

**Bonus points for the following:**

- It is deployed and publicly available via a URL
- The code has a good test suite