EMS patient data project research

1. Statement of requirements

1. problem

The current EMS software system fails to provide EMS personnel with knowledge of patient at response time. A data platform which provides patient information including drug information, prescription, condition, and chronic illness will greatly reduce patient check-in time and lower the healthcare cost. The EMS Software solutions available in market are mainly focusing on billing, field data collection and scheduling.

2. Solution

Our goal of the team project is to build an electronic platform to allow EMS personnel access to patient data. The data platform allows first responders to query critical patient data and highlights drug information and patient conditions. Warning flags are displayed for quick analysis in case of high risk transportations. System allows responder to obtain more detailed information on conditions, prescriptions and physicians if needed.

3. System requirement

The system is deployed in Docker as an online responsive web app. The backend is developed in Java.

4. Functional requirement

Based on the feedback from TA, we developed a list the functional requirement for the project.

ID	Description	Priority
1	The backend is built on a FHIR API	High
2	The system requires authentication	High

3	The backend maintains an access (audit) log tracking user queries	Low
4	Patient lookup by matching address and patient name	High
5	Single dashboard displays all patient information	High
6	Patient details include medications, chronic illnesses, observations	High
7	Emergency states include new, active, and closed.	High
8	Separate EMS call center organization role and EMS crew role	High
9	Multiple lookup criteria	Low
10	The system can store EMS medical notes	Low
11	The system can display a list of potential patients once emergency is created	High

5. Non-functional requirement

Based on the feedback from TA, we developed a list of non-functional requirement for the project.

ID	Description	Priority
1	The web application should be intuitive and self-explanatory.	High

2	The system shall respond rapidly to the users' query.	High

2. Use cases

Use cases are designed by team and TA together to simulate the software solutions. They are meant to describe the main features of the project. Below is use case diagram for the user.

3. Domain analysis

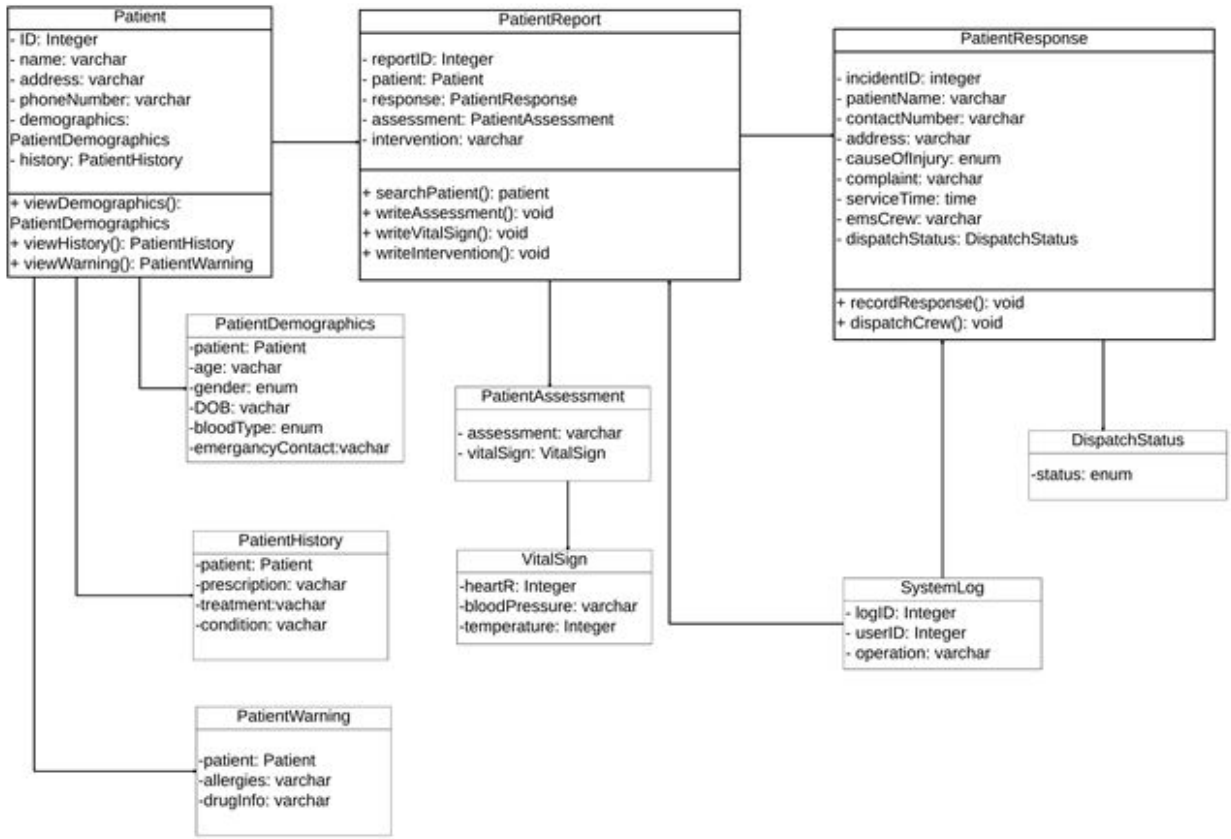
1. Phase I: Call to Dispatch

All EMS incidents begin with an initial call to EMS call center. The EMS call center collects all important information quickly and create an emergency case. The EMS call center checks for prior location/patient histories.

2. Phase II: Dispatch to ePCR Software

The dispatched ambulance crew queries the patient information and identify critical information. The communicating accurate patient care reporting data and locations is of the greatest importance.

4. Class diagram



5. System Architecture

Our web app utilizes a three-tier architecture system and consists of 3 layers. These include a presentation tier, an application tier, and a data tier. The presentation layer is primarily represented by UI interface which is used to display emergency and patient information. The application layer consists of logical operations and FHIR data access. Finally, our data tier consists of our FHIR database where synthetic patient information is stored and retrieved.