Backend Development of XRAD Electronic Medical Records System

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INTRODUCTION

The XRAD team is producing a new electronics medical records system for use in hospitals in Africa and around the world, which currently uses paper medical record systems. Working on backend development for the project included developing a REST API model (fig. 1) for the project using a Mongo database and Node and Express. The team collaborated with hospital staff in Botswana to develop the system specifically for this hospitals needs, focusing on oncological models and cancer treatment modules.

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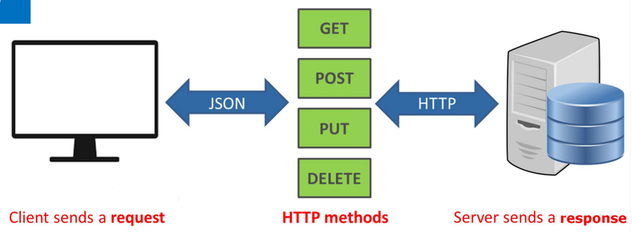

Fig. 1: REST API model

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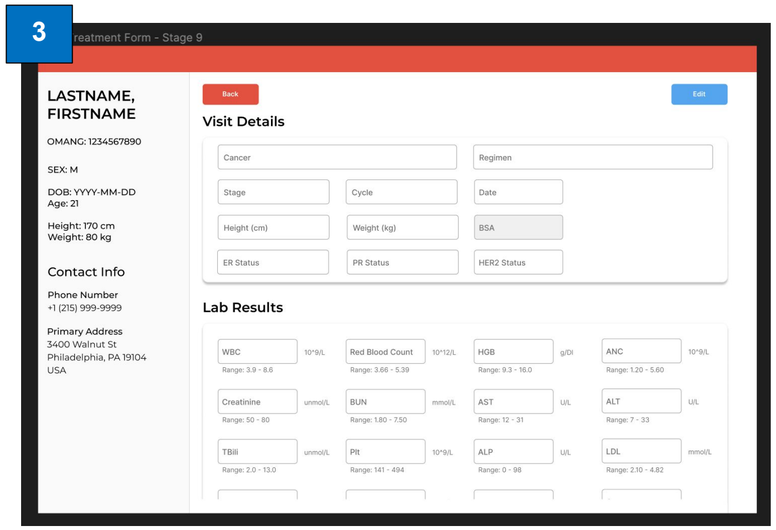

Figure 3: Model for frontend design of treatment form, including visit details and lab results for some patient.

2

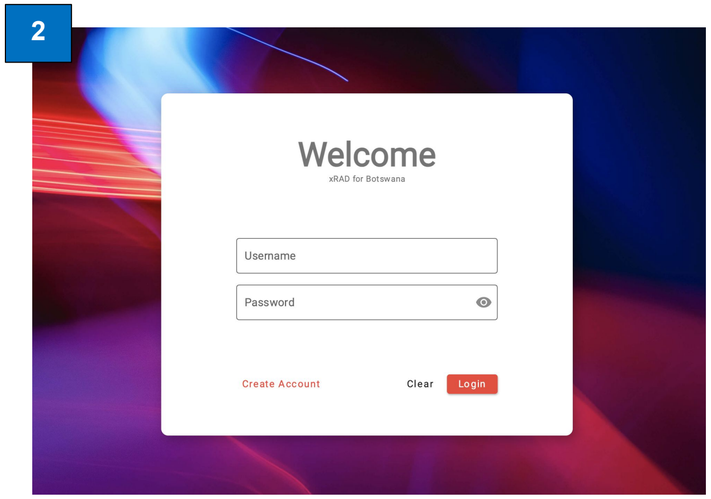

Figure 2: Sign in page for an earlier version of the program

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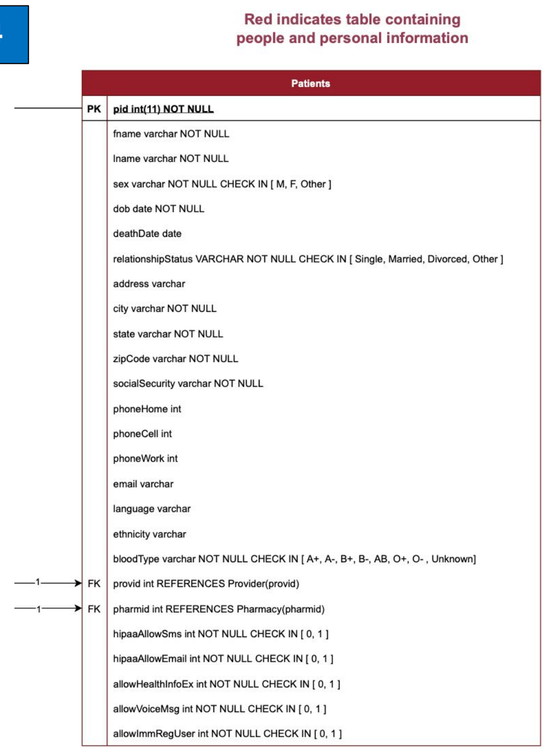

Figure 4: Portion of ER diagram documentation. Details “Patient” model and fields.

METHODS

The program was designed by a frontend team and backend team. Both teams would meet weekly to discuss progress and next steps. Then the teams would meet with hospital officials from around the world to discuss feedback for the system and improve models.

The initial implementation of the records system was not a client server model, whereas the new model in development will be. The team has been improving the models for over 5 years and an older model is based in PHP (fig. 2).

Figure 3 shows a mockup of the frontend for the newest version of the medical records system, using Dart.

For the backend of the project, the team utilized many programs, including Postman, Compass, and a Mongo database. The team began with detailed backend documentation, and then developed ER diagrams (fig. 4) to plan out the models and routes prior to implementation, and to simplify communication between frontend and backend teams.

LIMITATIONS

Development of the program has been a detailed process and thus, quite timely. Communicating with hospitals across the globe takes time and then revising the program to model the needs of the hospitals and continuing to improve models slows the process of development.
The program currently has difficulty accounting for patients who have been diagnosed with a cancer, but have yet to start treatment. The team hopes to improve this in further development of the program.

CONCLUSIONS

The team has been working on many versions of the XRAD electronic medical records system for some time and are now working on a REST API version.
Moving forward, the team is modulating the program hoping for it to be implemented in many hospitals across the globe, and easy specialising it to each hospitals needs.