

Stage 6: Project Report
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1. Please list out changes in the directions of your project if the final project is different from your original proposal (based on your stage 1 proposal submission).

We were planning to include a creative component that would allow the users to input their symptoms data in multiple stages as compared to one stage. Each stage would filter out other possible causes to give the user more specific results. With one of our team members dropping the course, we weren't able to implement this, but still had a form that users could enter their symptoms in to return causes and treatments.

2. Discuss what you think your application achieved or failed to achieve regarding its usefulness.

Our application did achieve its usefulness. The purpose was to let users find relief for their symptoms, and our app does that. Users can search for their symptoms and find potential causes and treatments. Users being able to save their searches helped them go back and look at treatments and symptoms they've been experiencing.

3. Discuss if you changed the schema or source of the data for your application

Our original dataset provided one table that held many people's symptoms that they had tracked for their chronic illnesses. We split this into separate tables for Symptoms, Illnesses, and Treatments. We also had to create new tables such as Searches for the users' saved searches and Accounts to store user account information.

4. Discuss what you change to your ER diagram and/or your table implementations. What are some differences between the original design and the final design? Why? What do you think is a more suitable design?

We did not make any changes to our ER design as we believed it was a suitable design that allowed for all the functionalities we wanted our application to have. The only thing we have that could be considered a change is a records table that has the key columns and data we needed from the raw data that we based the other tables off of. (did we add another table?)

5. Discuss what functionalities you added or removed. Why?

A part that we deviated from in the final as opposed to the proposal is that we were going to have users input gender and return recorded data of others in the database. Instead, we have a readily available sex statistics page in which users can see the top illnesses and the amount of users that have said illnesses split by gender. We thought that this version would be more universal and simpler, but more inclusive, to implement.

A part that we removed was the daily updates page where users are able to input their symptom/illness/treatment information and log it everyday. This was due to issues with getting our transaction working.

6. Explain how you think your advanced database programs complement your application.

The sex statistics was one of our advanced queries and really adds to our application as it displays the size of the database and the wide range of conditions and illnesses the users in our database deal with. This allows users to realize that there are many others who they can relate to and can see what issues they've experienced and how they've solved them. Our second advanced query returned the most frequent method to improve other people's symptoms. Users are able to get quick results on the treatments that most worked for other people. These allow our users to connect with similarly affected individuals and to improve their own conditions with primary data, not simply recommendations from people who know about the illness/condition but have never experienced it.

We have used a trigger to update a user's search records in their account homepage. This allows users to be able to see what they search for and the top result of that search for the 3 most recent searches. This functionality allows users to go back and see previous results without needing to search for the same thing over and over which is not optimal.

7. Each team member should describe one technical challenge that the team encountered. This should be sufficiently detailed such that another future team could use this as helpful advice if they were to start a similar project or where to maintain your project.

Sally: From my part, I feel like setting up the database is quite a challenge. Because the raw dataset is messy and very large, we had to come up with an efficient way to link and classify different useful data. I have tried multiple ways to connect different tables with unique foreign keys. Based on the feature of our data, all of our tables are use auto increment primary keys. Also, more table are added to database to separate read from write.

Ananya: Our queries took a lot of time to run, and learning how to optimize our searches was a challenge. At first, some searches were taking over a minute to load! By understanding what to add indices on, we were able to significantly reduce the cost of our queries. For example, indexing on columns in the "where" clauses of our advanced queries provided a significant reduction in time.

Haley: One technical challenge we encountered was trying to implement a transaction to update our tables when a user input their daily updates (symptoms, conditions, treatments etc) so that there are no data inconsistencies. Ultimately, we had to remove the user daily updates section as without a transaction, there would've been read-after-write inconsistencies with other users trying to search for data before the update had been fully completed. This is possibly due to deadlocks in trying to access

the same data at the same time or the order of actions clashing with the isolation level. If we had more time we would fix it by splitting up the transaction into smaller ones and changing the isolation level so that locks aren't being held for a long time.

8. Are there other things that changed comparing the final application with the original proposal?

We introduce more API to final application comparing with the original proposal.

Not only can users search for possible illness by symptom, they can also search illness for possible treatments. They can also view statistics based on sex. They can also see the most frequent search symptom.

9. Describe future work that you think, other than the interface, that the application can improve on

I think we may try to use more efficient search methods, for which some machine learning algorithms can be involved. Also based on the feature of data, i think we can applied some more index design and do more data cleaning stuff to make whole process faster.

10. Describe the final division of labor and how well you managed teamwork.

For our application, we divide the work as such:

Anya: SQL query and frontend

Haley: SQL query and frontend

Sally: Middleware and Backend

We have held team meetings to catch up with progress and keep connected regarding any update.