

Final Conclusions

Did you fulfill your value proposition? Explain.

Value proposition: BlueSkies is a web application that provides a straightforward assessment of the desirability of living in various regions throughout the U.S. for individuals with particular medical needs, based on data regarding known protective and risk factors such as healthcare coverage, healthcare costs, prescription drug prices, availability of medical facilities, and environmental conditions. This product will enable already burdened populations to make informed choices in the interest of their health using data modeled from a wide range of reliable sources in a clear and transparent manner.

Our value proposition was partially fulfilled. We created a web application that provides data on the availability of medical facilities, environmental conditions, healthcare coverage, socioeconomic metrics, and health outcomes relating to a specific condition (asthma) for the geographic location queried by the user. Our web application is straightforward and provides various metrics related to asthma and quality of living, however, we did not compute a general assessment of a location's desirability in the form of an aggregated rating. Also, because we only focused on asthma as a medical condition, we did not fully fulfill our value proposition that referred to a wider breadth of medical needs.

We found that designing an algorithm to assign a desirability rating of a location based on an array of health metrics was ultimately outside of both our expertise and scope of the course. However, by creating a data model that provides the metrics for the location queried against national averages, we give the user the tools to come to their own conclusion based on their unique needs.

Compare what you initially planned to deliver (as stated in PM1) to what you actually delivered

Originally Planned	Actually Delivered
PM2: In this stage, we will demonstrate relationships using a UML diagram. Included in the diagram will be classes for: individuals, PBMs, pharmaceutical companies, location, insurance type, government rules/regulations, among others.	PM2: We delivered a UML diagram with the following tables: condition, treatment, pharma company, drug, drug utilization, state, health care spending, health care utilization, location, county, air quality, hospital, and hospital quality.
PM3: By this stage, we will have a list of questions that can be answered using the data we have.	PM3: We created a list of internal business insight questions and used the data (via SQL) to answer them.
PM4: At this point, we will have the visual portion nearly complete. We will have a web application built and ready to launch.	PM4: We had the beginnings of a web application in the makes. It was very basic and lacked creativity and complexity.
PM5: In this stage, we will combine external data sources into our product and demonstrate this using ETL workflows. We will also have a variety of graphs presenting the data used in our product.	PM5: We combined three additional external data sources into our existing data and demonstrated the addition/combination using two ETL workflows. We modeled this data in various charts and graphs.
PM6: The last portion of this will be the final write up, presentation, and demonstration of the project. We will have a working product as well as written conclusions about our project and product overall.	PM6: We have written this write up as well as included and expanded upon all of our finalized code. We will be recording a demonstration of our product as well as a presentation of what we did in the near future.

As far as the project milestones go, we delivered exactly what we said we would. In addition, we made substantial improvements to the JDBC/JSP for the PM6 submission in order to more closely align with our value proposition. In regard to the CRUD operations mentioned in the project description, the ones we created for the PM4 are still accessible via URL, but there are no links available from the public side of the application within our submitted code when run. This is because create/update/delete are not things that the user of this application would be doing. Along with the individual JSP urls, we have begun consolidating those CRUD operations on a separate location within the application for data administrators (links noted below).

Explain what changed in your final UML (including which milestone did you make changes and why)

UML is attached. We ended up changing a bit between the start and the end. Subtractions include the Treatment, Condition, and Pharma Company tables. These three tables were removed during PM4 because we realized that Pharma Company is not relevant to what we were looking for, and Treatment/Condition is not easy to describe and compile data for as there are multitudes of different treatments/conditions and they are often individualized.

Additions include Asthma Impact, Healthcare Coverage, and Socioeconomic tables. Healthcare Coverage was added during PM4 as a representation of who has healthcare and who does not. The other two tables were added as a part of PM5 and the addition of new data sources merged into our project.

What went well?

It was a challenging and worthwhile project. The breakdown of each individual stage was very helpful in managing what needs to be done. We selected a topic (healthcare and outcomes) that had a wide range of available datasets, particularly relating to geographic regions.

What would you do differently?

Have a smaller focus area to begin with. It is much easier to expand something into a larger something than vice versa. We were too broad at the beginning and that hindered our ability to produce what we wanted to at the end. Also, in order to make the data model most useful, it would be helpful to consolidate with experts in data analysis and statistics, particularly as it relates to tracking health care outcomes.

What do you plan to do next?

There are many things that we can continue. In the immediate future, we plan to relax. In the long term and if feasible, we would like to continue building this application in order to expand on things that we could not do in the time frame of the semester while learning new technologies and methodologies.

Potential improvements include:

Additional Query Options

- Search by state, county, or region, rather than just by zip code.
- Compare two locations against one another, rather than defaulting to the queried location against US Averages.

Web Application Design

- Building out the front end/styling of the application.
- Adding an interactive map to select a query by clicking a location.
- Describing the sources of the data and the timeframe it relates to.

Data Quality

- Including additional data sources for a more accurate representation of the metrics.
- Regularly updating the data sources with the most recent datasets available.

Efficacy

- Designing and implementing an algorithm to assign a desirability rating using an aggregation of the data for a location.

To run the completed application locally, open the sources files included in **BlueSkiesApp**:

- Run the entire contents of **create_db.sql** file in mysql to generate the BlueSkiesUML database.
- Open the **eclipse-workspace > BlueSkies** workspace as a project in Eclipse.
- Configure any local database details in ConnectionManager.java (such as user and password).
- Select the option to “Run as > Run On Server”
- Once running, the homepage should open in Eclipse and display the public-facing application:
 - <http://localhost:8080/BlueSkies>
- Additional CRUD operations queries can be seen by visiting:
 - <http://localhost:8080/BlueSkies/dataadmin>

Example Query Result:

Zip Code Search Result: 02360
Plymouth, MA

City-Level Data: Plymouth

Hospitals
Beth Israel Deaconess Hospital, Plymouth

- Overall Rating: 5/5
- Mortality: Above national average
- Safety: Above national average
- Readmission: Below national average
- Patient Experience: Equal to national average
- Effectiveness: Equal to national average
- Timeliness: Below national average
- Efficient Use Medical Imaging: Equal to national average

County-Level Data: Plymouth County

Air Quality
Plymouth County

- Good days: 223
- Moderate days: 19
- Unhealthy for sensitive population days: 0
- Unhealthy days: 0
- Very unhealthy days: 0
- Hazardous days: 0
- Total days measured: 242
- Max Air Quality Index: 90
- Median Air Quality Index: 39

US Averages

- Good days: 167
- Moderate days: 32
- Unhealthy for sensitive population days: 1
- Unhealthy days: 0
- Very unhealthy days: 0
- Hazardous days: 0
- Total days measured: 202
- Max Air Quality Index: 98
- Median Air Quality Index: 36

Socioeconomic
Education
Plymouth County

- Less than high school diploma (%): 7.0
- High school diploma only (%): 27.0
- Some college (%): 28.0

US Averages

- Less than high school diploma (%): 13.0
- High school diploma only (%): 34.0
- Some college (%): 30.0

Data Administration Portal:

BlueSkies Data Administration

Hospital Data

Create Hospital

Find Hospitals By Zip Code

Geographic Data

Create Location

Create County