CSE 587: Project 2
Stage 3 - Building an analysis and visualization user interface

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1 Objective

Create visualizations that provide insights into the situation of classroom scheduling at UB's North Campus.

2 Dataset

The dataset used were comma separated files (.csv) that describe the various classrooms on North Campus with details such as semester, classroom, current no. of students, maximum no. of students. We ran this dataset through multiple MapReduce programs to generate data to be fed into Tableau for more insights. The individual measures of the 20 questions was mentioned in the Stage 2 report.

3 Observations

3.1 Visualization Approach

We believe that the greatest insights come from the simplest of data. We opted for the breadthwise approach to data analysis and decided to tell the story of classroom scheduling through the following approach

- 22 individual sheets

- 5 dashboards containing those 22 individual sheets

- 1 story from these 5 dashboards

3.2 Dimensions

In data warehousing, dimensions are the attributes which are non-measurable. In our story, we identified the following attributes as non-measurable and proceeded to map them.

- Department

- Buildings

- Semester

- Time Slots

- Year

3.3 Design Decisions

We used a variety of charts to represent different visualizations since we felt the user shouldn't feel monotonous. Also some charts are better suited for certain analyses than others. Some of the charts that we used were

- Line Charts - Quantitative analysis

- Pie Charts - Relative measures

- Scatter Plots - Representing time

- Packed Bubbles - Relative measures

3.4 Individual Sheets

We had solved 20 questions in the previous stage of the project and incorporated them into this stage. We also felt that the exam schedule data given also provided some novel insights and mapped them too. Let us see some of the examples.

3.5 Dashboards

Dashboards offer a high level overview of individual sheets and a holistic view of the analysis that we are trying to implement. Examples of dashboards are shown in figure 4 & 5. Also, implementing filters in these dashboards help the user query efficiently and perfectly. Some of the filters that we implemented are shown below in figures 6, 7 & 8
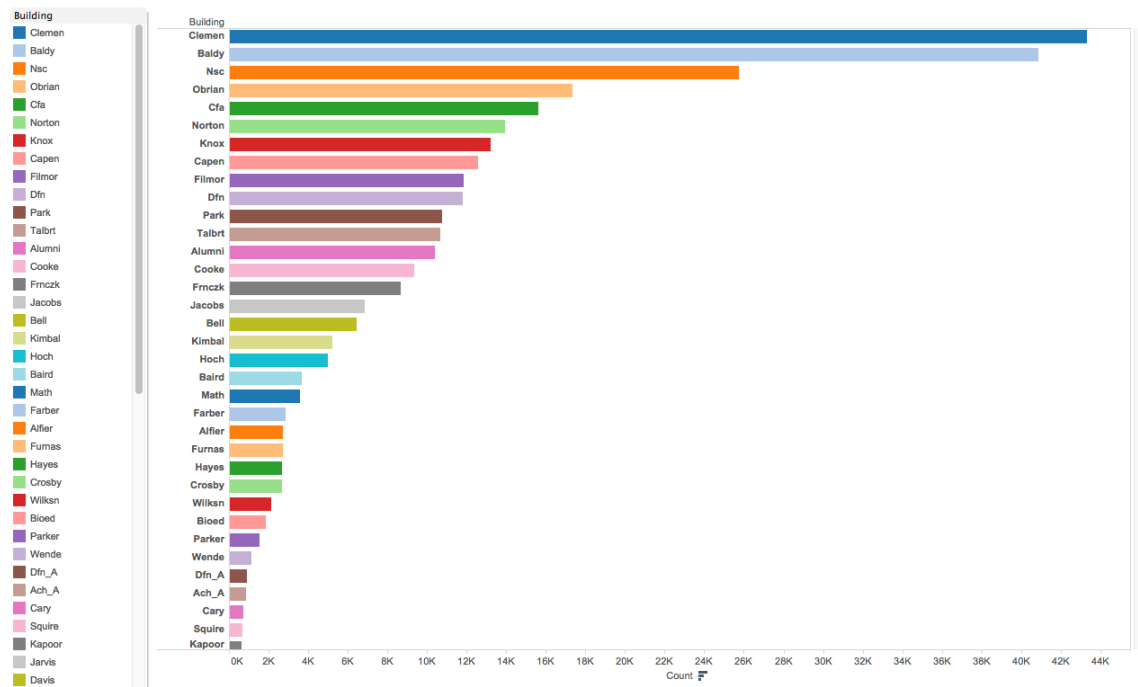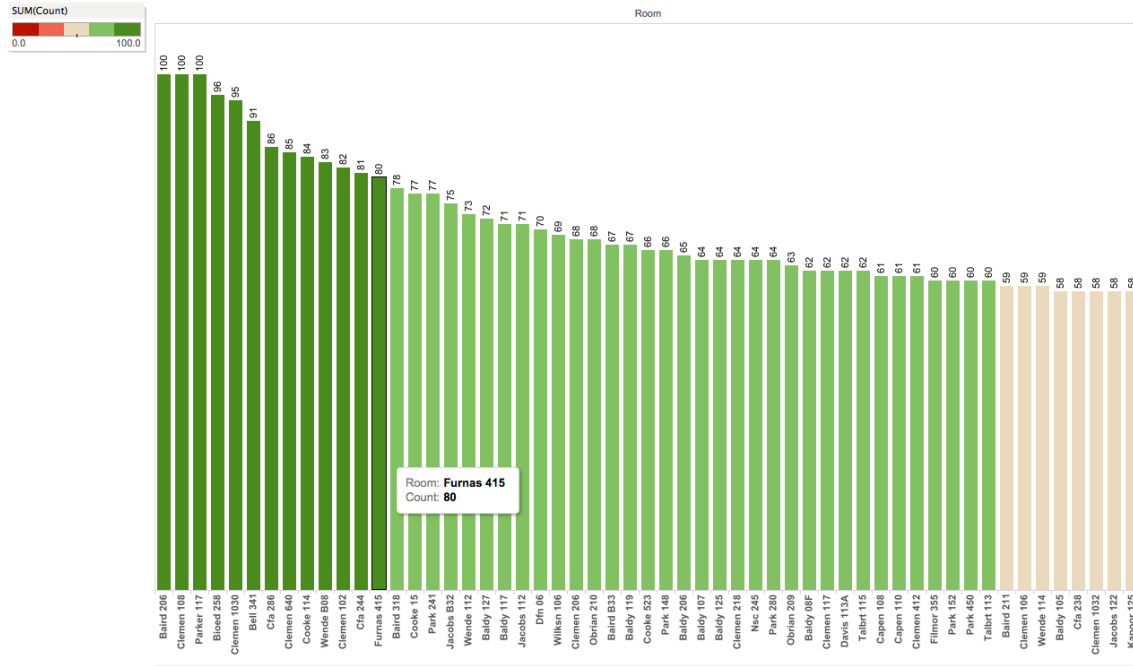
Figure 1: Building Utilization

Figure 2: Room Count

3.6 Stories

And finally we conclude with the story. The story serves as a one stop solution that describes the current classroom situation prevalent in UB's North Campus, a historic perspective, parameters playing a major role in utilization and/or wastage. It also combines a few elements from the examination scheduler providing interesting correlations. It includes the following dashboards

- Department wise dashboard

- Building wise dashboard

- Semester wise dashboard

- Time slot wise dashboard

- Year wise dashboard

3.7 Conclusion

The classroom scheduling data analysis concludes with this group of visualizations in
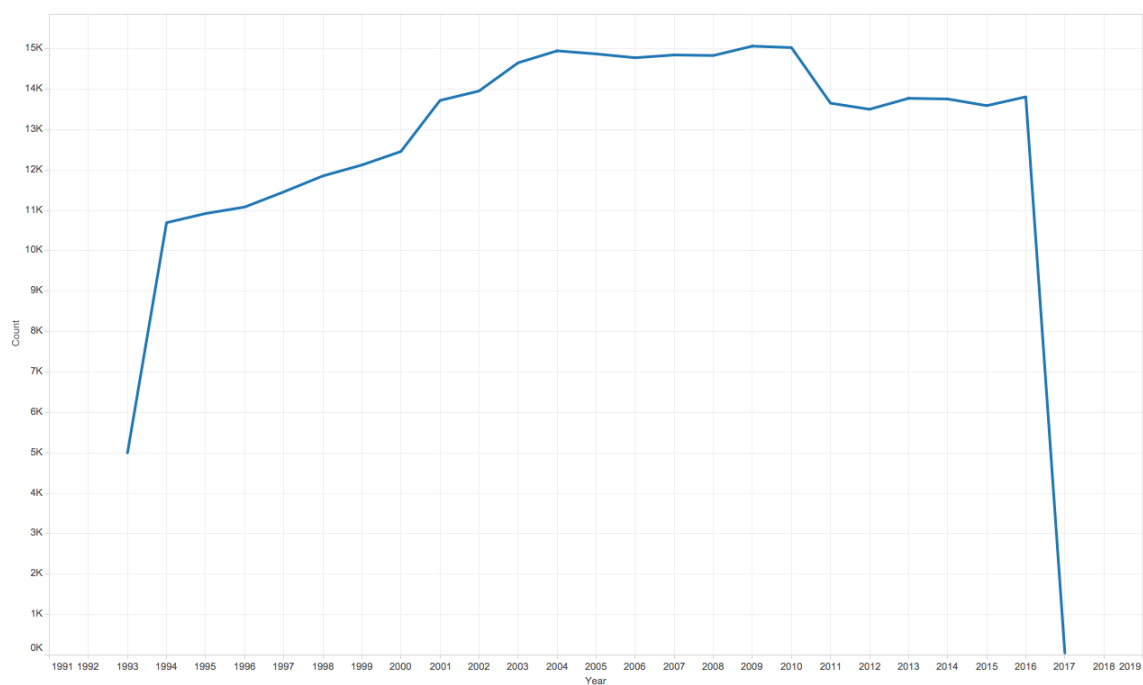
Figure 3: Line Graph

Tableau. The application end user is now in a position to truly comprehend the dataset and make quality decisions from it.
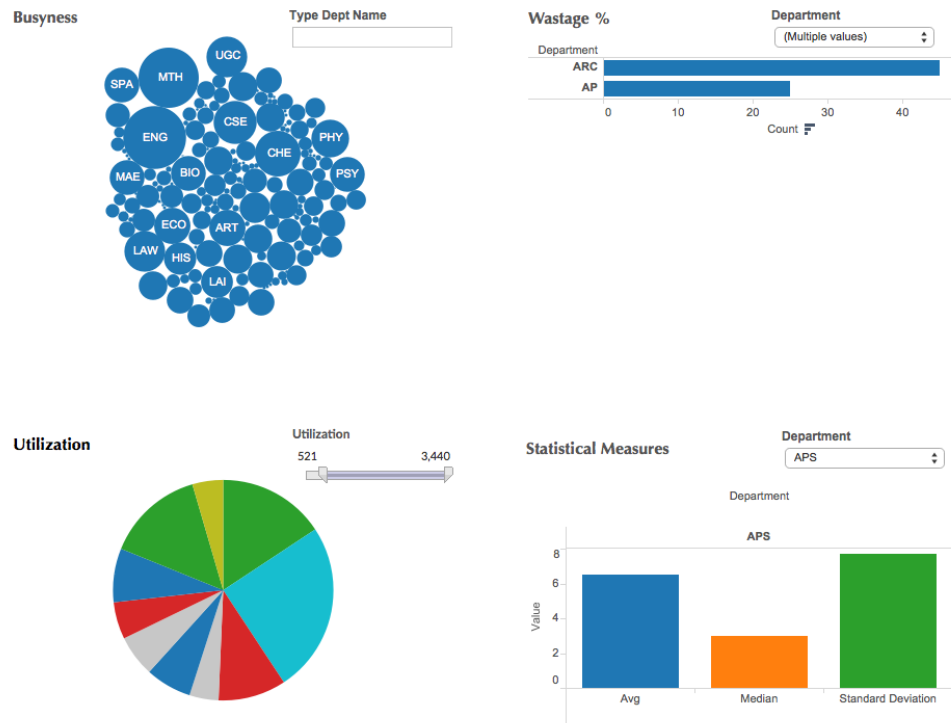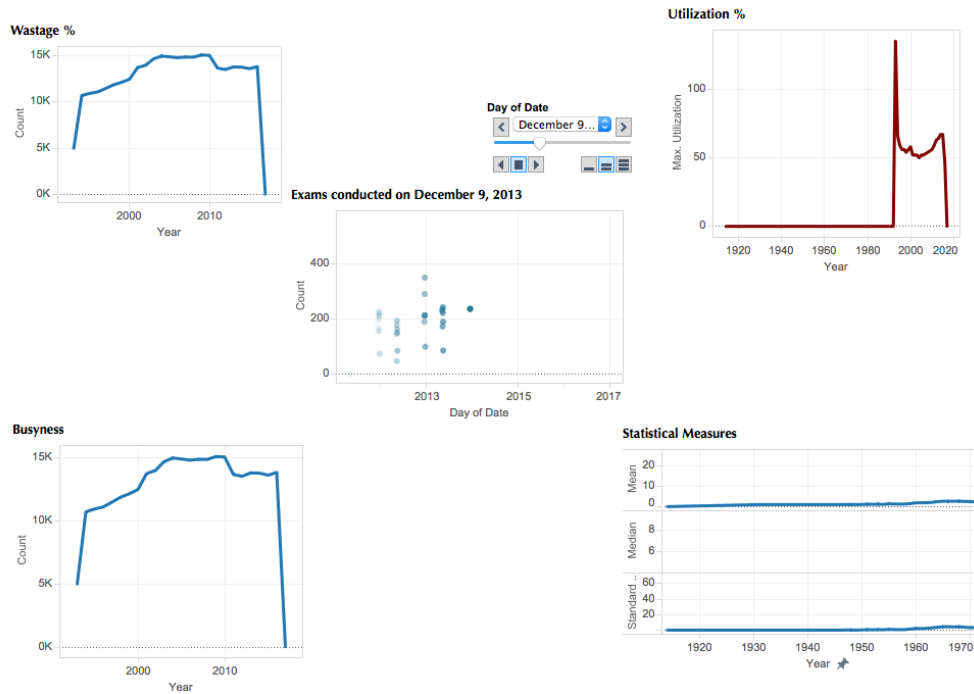
Figure 4: Department dashboard
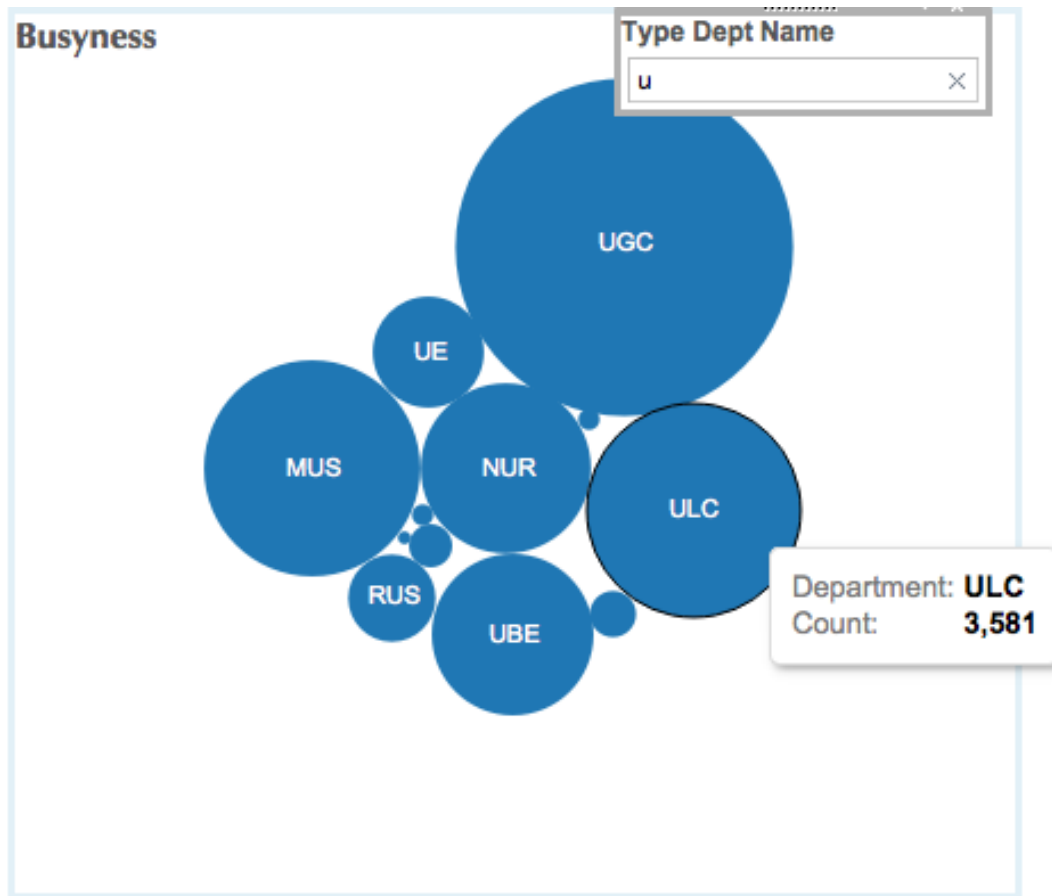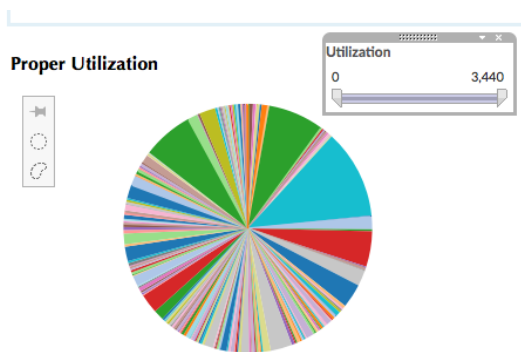
Figure 5: Time dashboard

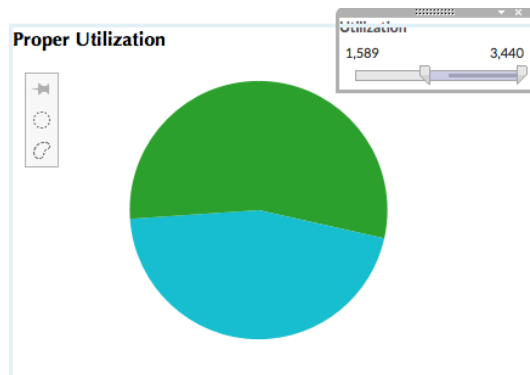Figure 6: Busyness detail

Figure 7: Utilization detail (before)

Figure 8: Utilization detail (after)

Figure 9: UB North Campus Story