Senior Design / BS Project
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Bascom Palmer Eye Institute

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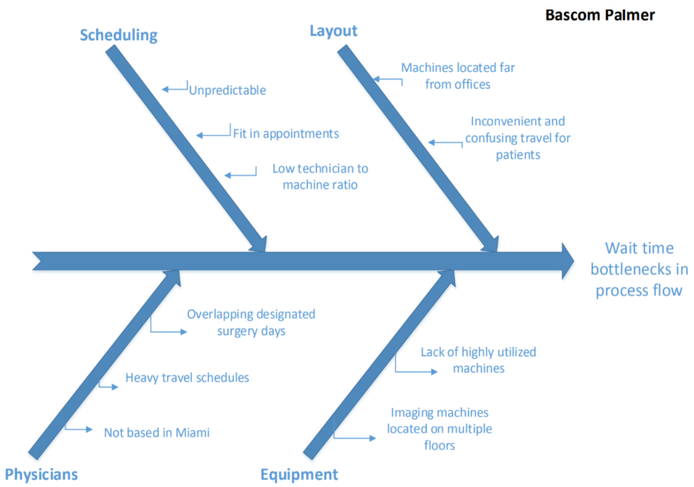
Bascom Palmer Eye Institute

Bascom Palmer Eye Institute, Miami is ranked as the best ophthalmic care center in the United States. Many patients from around the world seek treatment from the faculty and staff at Bascom Palmer because of their high level of expertise.

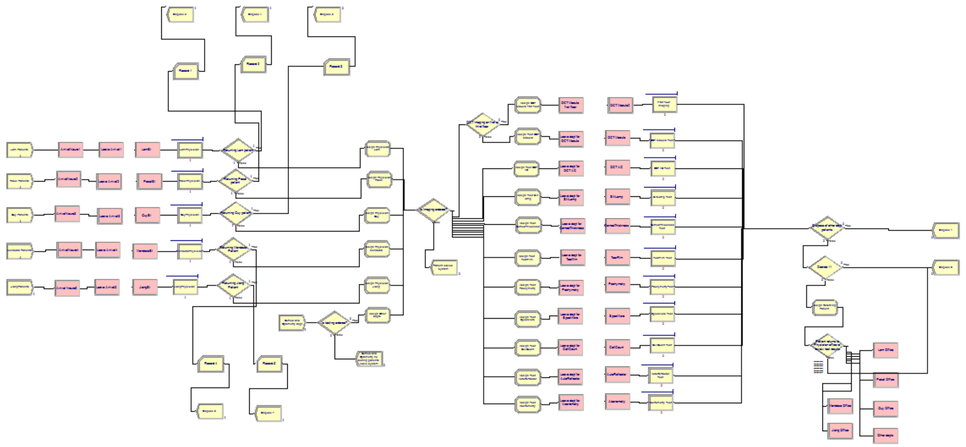
Introduction

One of the main challenges of Bascom Palmer Eye Institute encounters is the high congestion of the system. Due to the high demand of patients seeking consults, patients need to schedule appointments months in advance in order to see a doctor. In addition, patients may spend hours waiting for imaging exams the doctor has ordered during their appointment because of the lack of resources and unpredictable volumes. Waiting times are central to the patient experience during the care process. Due to this complex situation, it was necessary to analyze Bascom Palmer's service as a system in order to optimize the process, evaluate and provide alternatives to decrease patient waiting times in the system.



Methods | Design | Analysis

The Arena software platform was chosen to perform discrete simulations, in order to obtain improvement proposals that will reduce the total time of the patient's waiting time for the third floor. This arena simulation model covers the flow of patients through the Neurology department on the third floor of Bascom Palmer from the registration time from the time the patient enters the process, through the imaging department located on the third floor. The purpose of this simulation is to analyze the impact of incoming patients from the Neurology departments as well as the Optometry and Cornea departments on the resources within the imaging department on the third floor. The simulation run time is a period of four weeks, for a total of 20 weekdays. Physician processing times and interarrival times were calculated from real time data.



Results

The model was validated in several ways through comparisons between the statistical output results and the real time data obtained. A part of the validation was done through the comparison between the conceptual model to the real system as outlined in the report. The logic reasoning process in the simulation was verified thorough the patient process flow and the assumptions made.
In the statistical results of the simulation, we observed the number of patients leaving the system is comparable to the actual schedules of the physicians and the real time data parameters. In addition, other factors such as wait time, and resource utilization illustrated that the primary bottleneck of the system is in physician resources rather than imaging resources.

Conclusion

The simulation has great potential for obtaining useful statistics related to the process and its capabilities. The Bascom Palmer team could utilize this simulation to compare future state resource or scheduling variations thus providing a form of predictive scheduling. In order to simulate the process with greater depth, the consideration of the more real-time data would be necessary for increase in accuracy. Although there have been gaps in this project due to unavailable data, the assumptions utilized in the simulation were carefully considered.

Moreover, the physicians' capacity in the hospital should be increased. It is necessary to hire more physicians with similar scheduling capacity as the highest utilized physicians and/or increase their schedule by one day. According to our simulation, this could potentially decrease the waiting time by half. In addition, we recommend that Bascom Palmer should consider the actual real time data the physician spends with the patient as calculated in our data analysis. The data shows the average physician process time is almost 4 times higher than the expected 15 minutes. The patients' appointment length should be increased, and multiple patients should not be scheduled per time slot. Furthermore, Bascom Palmer if machine capacity is increased, we recommend increasing the capacity of the Optovue machine as it has the highest utilization rate. Placing this machine near or within the Neurology department would provide a faster turnaround time when patients need OCT imaging, the highest imaging demand.

We recommend a further analysis of the process with the additional necessary real-time process input data for a more precise representation of the process.

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