Data Analytics to Improve Decision Making in Radiology Body Imaging Operations

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Background

The University of Washington Medical Center and Harborview Medical Center (HMC) have a combined Body Imaging department that performs both diagnostic and therapeutic procedures on the abdomen, chest, and pelvis areas. ScanSight is a software application that provides a comprehensive set of tools for analyzing and visualizing Body Imaging scheduling data.

Current State:

- Large number of scheduling variables and physician preferences
- Lack of insight into case demand trends omits the opportunity to effectively staff physicians and reduce late scan readings
- Lack of transparency in scheduling operations

Opportunity Statement:

The opportunity is to use a comprehensive data analytics tool to improve scheduling operations.

Objectives:

- Increase scheduling transparency
- Reduce late scan readings
- Optimize staffing

Solution

The Data

ScanSight intake receives information on each case read per day, including the read location, modality type, and number of cases read. The data set contains information for the past five years, providing a comprehensive data set for analysis.

The Approach

A bar chart was selected to enable a simplistic comparison between different modalities and locations. The efficiency plots determine the number of cases read as a function of how many radiologists were scheduled to work per user input. The efficiency tab accepts user inputs and finds all variations of the number of radiologists working, then displays the number of cases read.

The Development (R + Shiny)

The UWMC BI Design Team used R, a programming language, and Shiny, a web application framework for R, to develop a data analytics tool. R is a flexible environment for data manipulation and statistical analyses. Shiny was used to create interactive user-interfaces for R programs. ScanSight application. The user can determine data plots and size, and input radiologist physician information for data exploration. Preliminary manual data plotting and statistical analyses were completed to understand the data before developing the tool.

Validation

- Identify insights into improving the efficiency and transparency of the Body Imaging scheduling operations
- Debugging, Design, Date Range, Location, Modality, Day of the week

Future Recs

- Connect data source to UWMC SQL
- Facilitate transparency in scheduling decision making
- Provide insightful data to improve staffing practices

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