

TEAM A4

CHI FRANCISCAN



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Mission Control Analytics Project

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Client: CHI Franciscan Health

CHI Franciscan is the leading healthcare organization with a network of hospitals in the Puget Sound region



Scope: ED Patient Flow Modeling

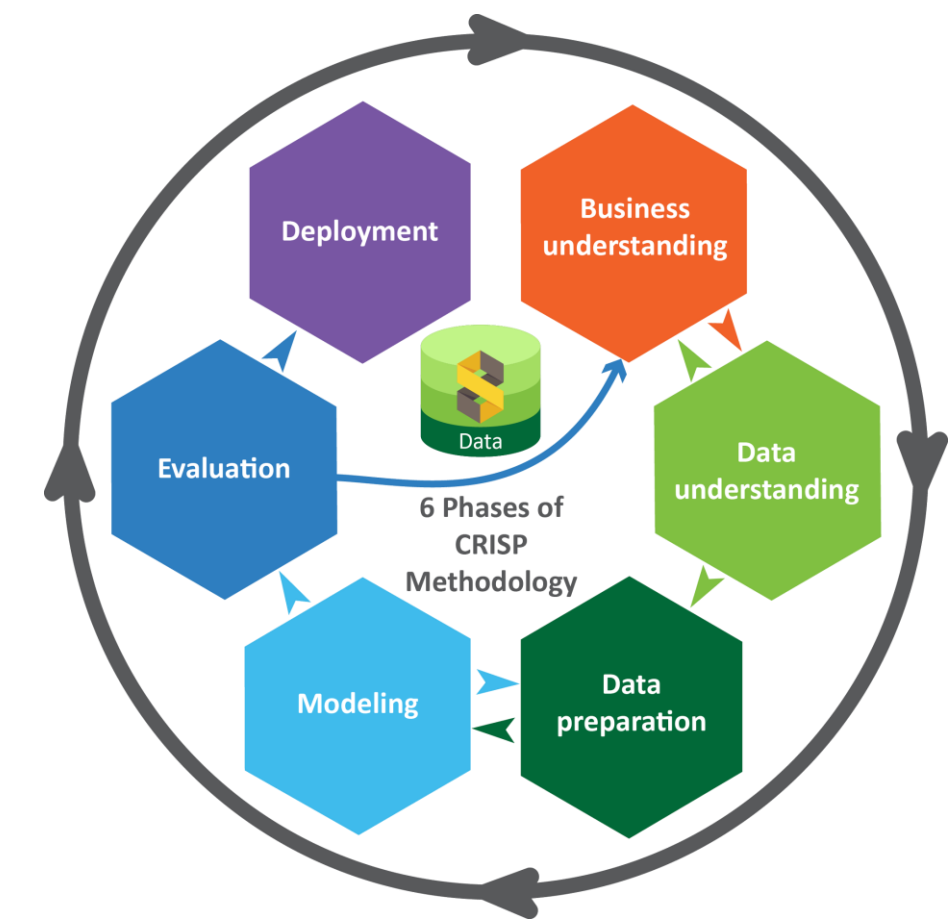
To model patient flow in emergency departments and offer recommendations so as to optimize bed capacity and reduce patient wait times across all hospitals

Data:

	hospita	boarderTypeCode	boardingDateTime	patientAlias	patientID	unit	boardingEndTime
1	BR	ED	8/21/2019 12:14	name00340	ID00340		8/21/2019 12:14
2	BR	ED	8/21/2019 12:47	name00341	ID00341		8/21/2019 12:47
3	BR	ED	8/21/2019 13:30	name00343	ID00343		8/21/2019 13:30

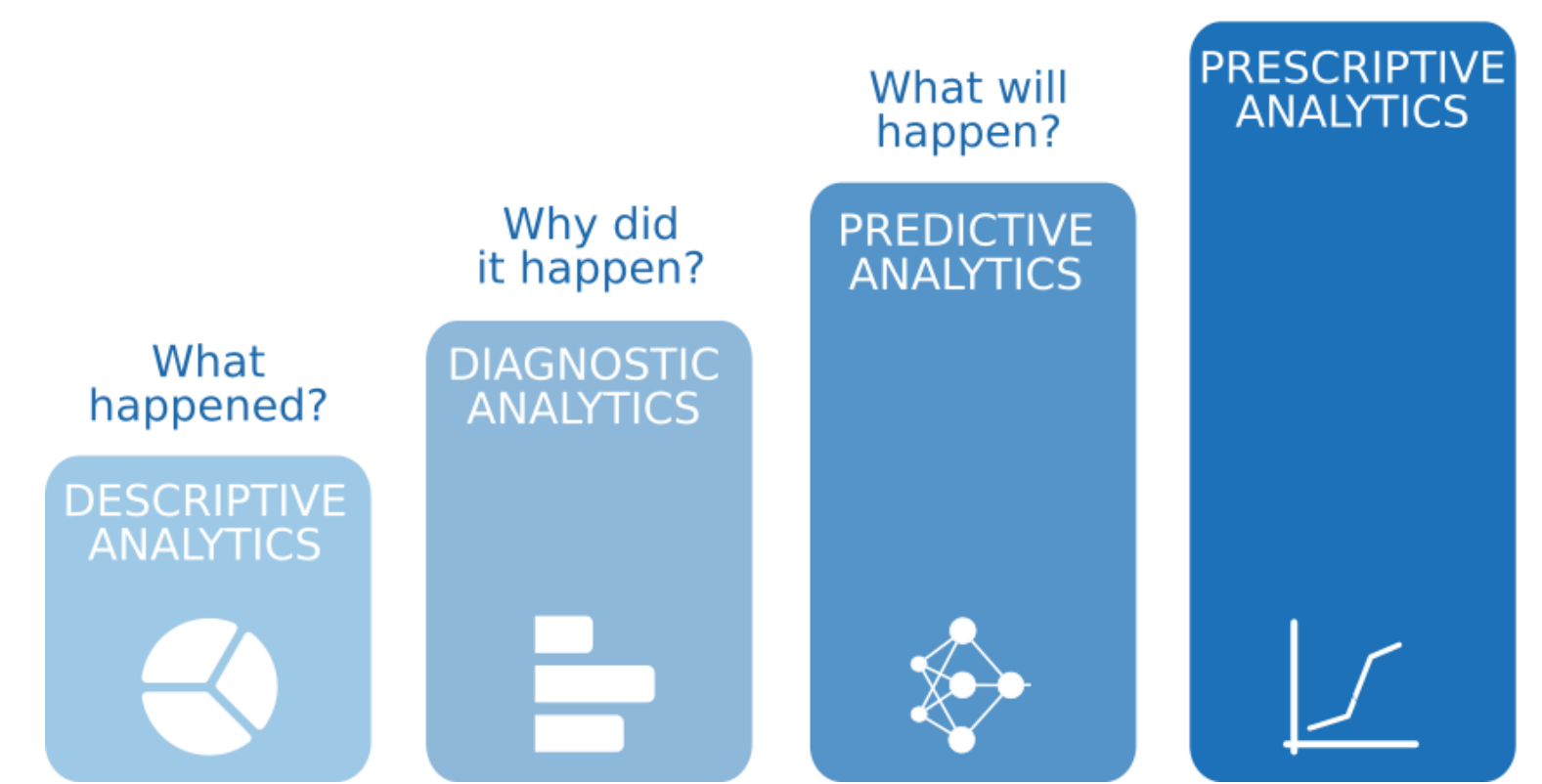
Methodology:

CRISP-DM



Data Analytics: Four Types

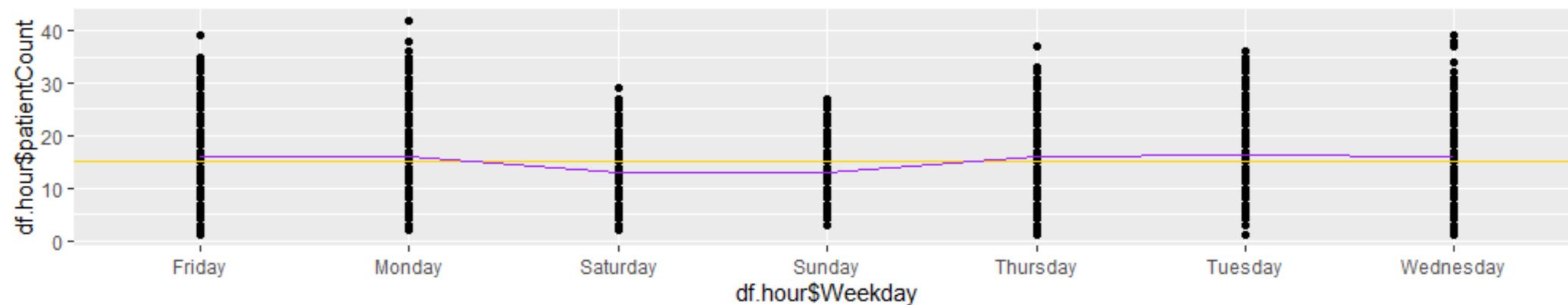
How can we make it happen?



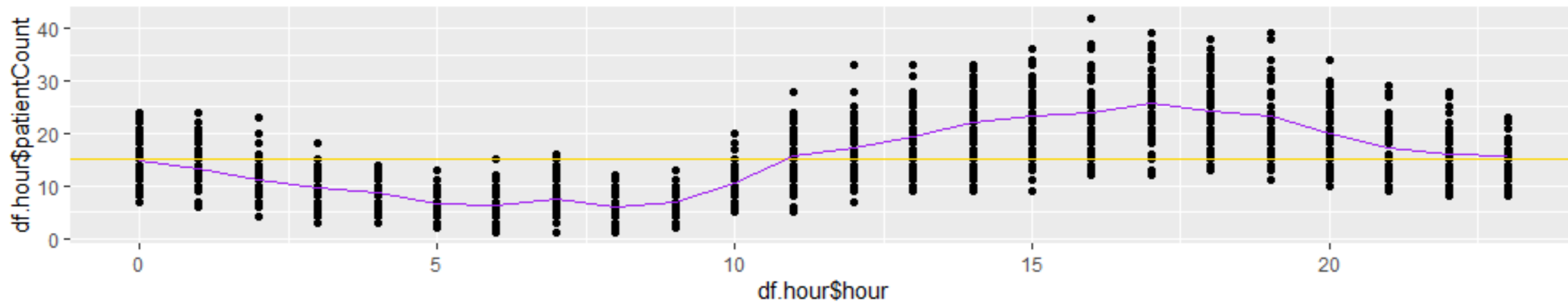
Descriptive Analysis



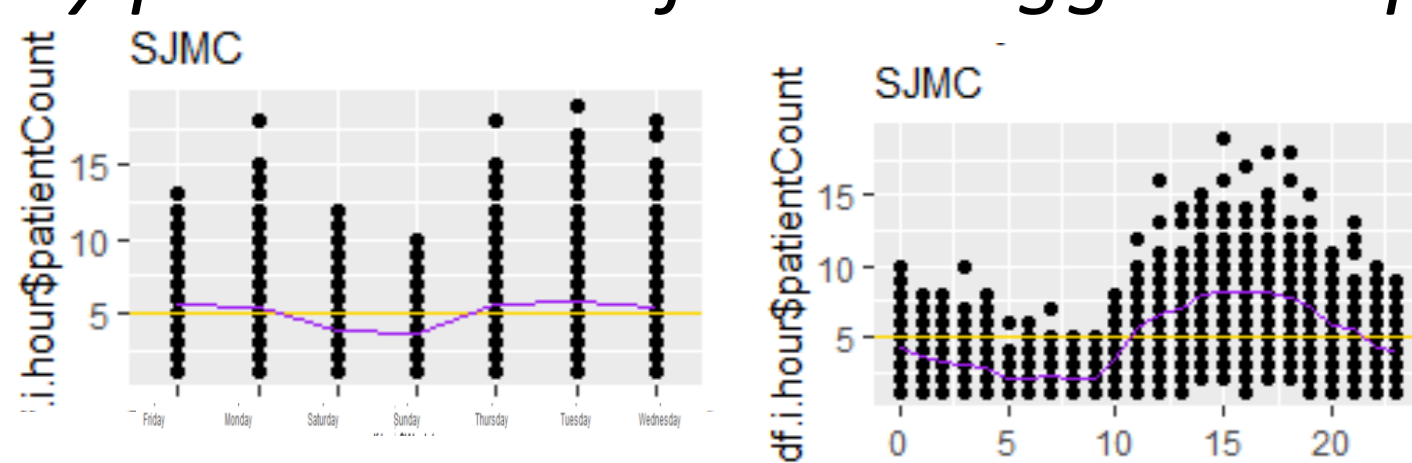
Patient Count depends on Day of Week:



Patient Count depends on Hour of Day:



Daily & Hourly patient trend for the biggest hospital (SJMC):

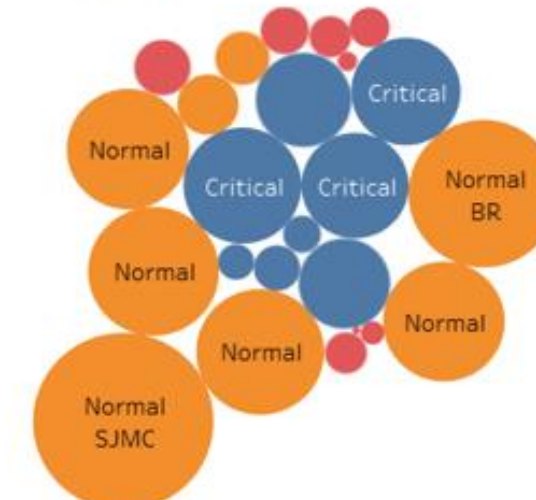


Diagnostic Analysis

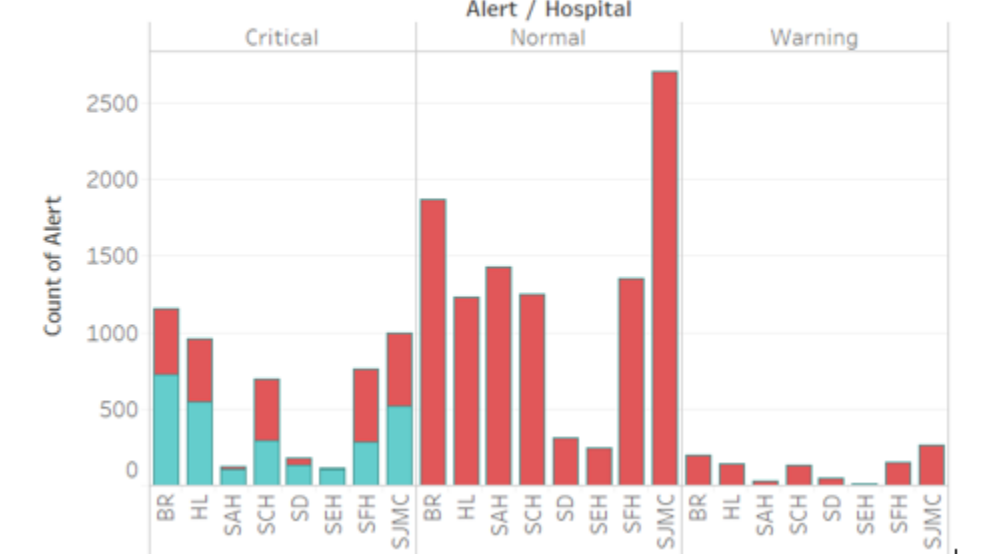


Distribution of patient wait times into normal, warning, and critical categories across each hospitals:

Alert Status for all the Hospitals

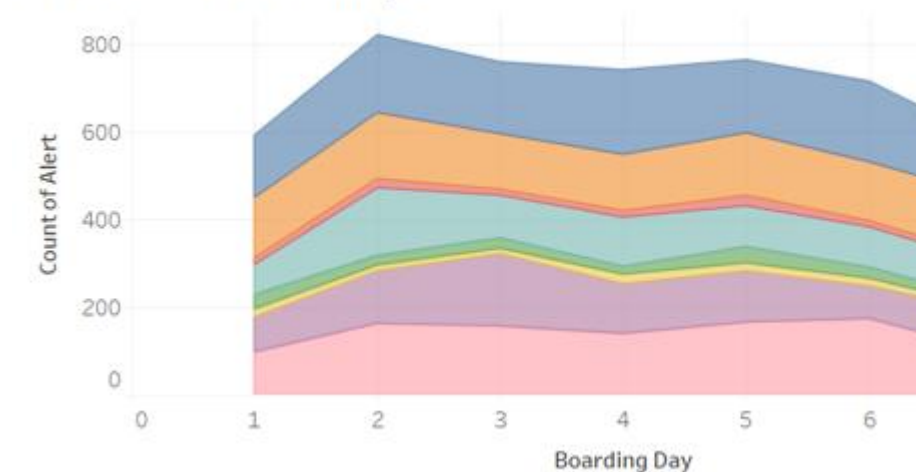


Alerts vs EDL/ED Holds

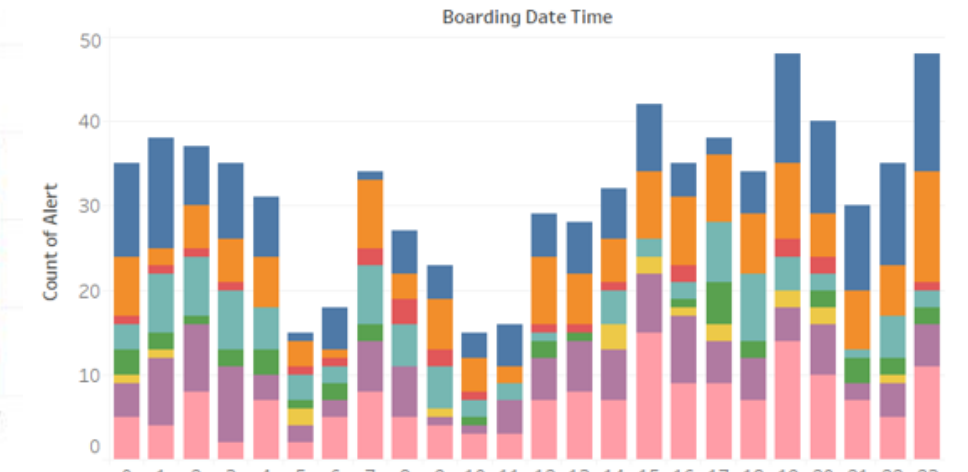


Critical alerts by Day of Week, and by Hour of Day:

Critical Alert on Daily basis



Critical Alert on Hourly basis



Predictive Analysis



Machine Learning Classification to predict wait time category and classify into Normal / Warning / Critical based on hour of day and day of week per hospital

Classification Algorithms	Accuracy
Naïve Bayes	37.44%
Random Forest	88.64%
Support Vector Machine	88.66%

Prescriptive Analysis: Conclusions

