Project Plan
Patient Service Delivery Planning

The Capstone Experience

Team Capstone Experience
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Functional Specifications

• Allows Spectrum Health to provide optimal care by predicting staffing needs
• Allows patients to find the facility with the shortest estimated treatment time
• Predictions based off of multiple data sources
  ▪ Past Spectrum Health data
  ▪ CDC, Weather Channel, and Census Bureau
Design Specifications

• Simple Patient UI
  ▪ Focused on simplicity and accessibility
  ▪ Designed for potential use in an emergency scenario

• Sophisticated Staff UI
  ▪ More options for statistical analysis and data visualization
  ▪ Includes charts of past data and future predictions
Screen Mockup: Patient Interface

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance</th>
<th>Patients Waiting</th>
<th>Recommended</th>
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</thead>
<tbody>
<tr>
<td>Alpine Urgent Care</td>
<td>0.3 miles</td>
<td>3</td>
<td>Recommended</td>
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<tr>
<td>Broadmoor Urgent Care</td>
<td>4.7 miles</td>
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<td>South Pavilion Urgent Care</td>
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<td>West Pavilion Urgent Care</td>
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<td>Zeeland Community Urgent Care</td>
<td>8.1</td>
<td>1</td>
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Call an Ambulance (911)
Screen Mockup: Patient Interface
Screen Mockup: Staff Interface
Screen Mockup: Staff Interface

SPECTRUM HEALTH

Mon-Fri: 8am-10pm
Holidays: Closed

5
Patients waiting per Provider

6
Providers

Waiting: 30
Under treatment: 6
Treated: 173

Sept 2015

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Screen Mockup: Staff Interface
Screen Mockup: Staff Interface
Technical Specifications

• Backend server that implements a RESTful API for fetching data and predictions
• Frontend application geared towards Spectrum Health employee usage
• Responsive frontend application geared for patient usage
System Architecture

[Diagram showing system architecture with Staff UI, Patient UI, RESTful Backend Server, Spectrum Health API, Weather Channel API, CDC API, United States Census Bureau API, HTML/CSS, Bootstrap, Angular.js, D3.js, .NET/C#, Math.NET Numerics, Web API, and Mongo.]
System Components

• Hardware Platforms
  ▪ Servers are the only hardware used

• Software Platforms / Technologies
  ▪ C#/.NET for backend
  ▪ Math.NET Numbers for statistic calculations
  ▪ MongoDB for database
  ▪ Angular.js for frontend
  ▪ D3.js for data visualization
Testing

- Karma for frontend unit tests
- Microsoft Unit Testing Framework for Managed Code for backend tests
- TravisCI for continuous integration
- Manual testing to ensure that the UI is intuitive and results are meaningful
- A-B testing via Spectrum Health to ensure application is meeting expectations
Risks

• Risk 1
  - Determining what actually affects people going to urgent care
    - Interviewing urgent care staff, studying past data
• Risk 2
  - Mathematically predicting number of patients expected per site
    - Use “regression model” method to set up a model that predicts over different variables
• Risk 3
  - Choosing the right technologies to integrate with Spectrum Health’s systems
    - Consulting with the SH Enterprise Architect
    - Considering new technologies in place of SH legacy technology
• Risk 4
  - Easily accessible and usable user interface
    - Contacting SH designer about A-B testing and mockups
    - Simplicity for the sake of emergency