MICHIGAN STATE UNIVERSITY Project Plan Spectrum Health Symptom Checker The Capstone Experience

Team Spectrum Health

Chris McGrath Jose Guadalupe Hernandez Josh Miles Morgan Muyskens Silas Brumwell

Department of Computer Science and Engineering Michigan State University

Fall 2017



From Students... ...to Professionals

Functional Specifications

Symptom Checker

- Users describe their symptoms (runny nose, cough, rash, joint swelling, etc)
- User's input is processed with NLP then mapped to condition and services from Spectrum Health are recommended
 - E-visit, MedNow, Appointment scheduling, Urgent Care & Emergency

Functional Specifications

- Pay My Bill
 - Users are able to view and pay medical bills
 - Payment processing is done through a 3rd party provider
 - Secured over HTTPS connection
 - Contact Us
 - Provides users with contact options such as Phone, US Mail, and Fax
 - •Careers

 Allows users to apply for careers at Spectrum Health

The Capstone Experience

Screen Mockup: iOS Application

●●●●● Sketch 穼 9:41 AM 100% Spectrum Health Q runny nose and cough You might have... Flu If you're experiencing a runny nose and a cough, you may have the flu. Tap to read more. Want to talk to someone? E-visit E-vists let you video chat now with a Specturm Health doctor Schedule an Appointment Want to see a doctor in person? Tap here to schedule an appointment MedNow Fill out a simple questionnaire and a doctor will respond in less than 24hours

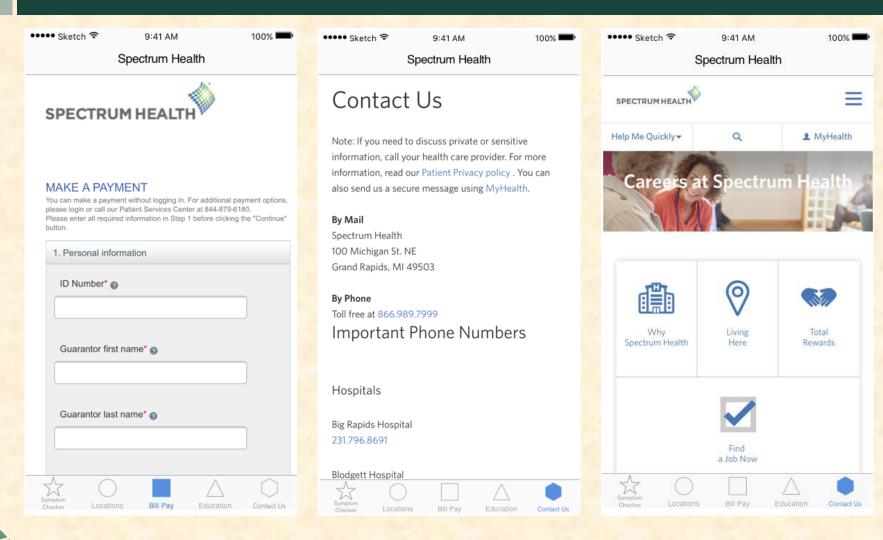
●●●●● Sketch 穼 9:41 AM Spectrum Health K Back Flu (Influenza) Influenza, commonly known as "the flu", is an infectious disease caused by an influenza virus. Symptoms can be mild to severe. The most common symptoms include: a high fever, runny nose, sore throat, muscle pains, headache, coughing, and feeling tired. These symptoms typically begin two days after exposure to the virus and most last less than a week. The cough, however, may last for more than two weeks. E-visit E-vists let you video chat now with a Specturm Health doctor Schedule an Appointment Want to see a doctor in person? Tap here to schedule an appointment MedNow Fill out a simple questionnaire and a doctor will respond in less than 24hours

100%

5

The Capstone Experience

Screen Mockup: iOS Application



The Capstone Experience

Screen Mockup: Android Application

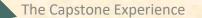
—	🎟 🛛 🔂 11:11		···· 🛿 🚺 11:42		5:42	
1	:	\equiv Spectrum Health	:	\equiv Spectrum Health	:	
SPECTRUM HEALTH		Enter what symptoms you're expe	eriencing:	Enter what symptoms you're experience	cing:	
MSU		I have a cough and a runny nose		I have a cough and runny nose	_	
Symptom Checker		Based on your symptoms, we suggest:		Based on your symptoms, we suggest:		
Pay My Bill Contact us		Visiting a nearby Spectrum Health Urgent Care facility.		Visiting a nearby Spectrum Health Urgent Care facility.		
< Careers		Nearby Locations	~	Nearby Locations	~	
GVSU		Hold my place in line	>	SHMG Urgent Care - Alpine. 5 min9 miles.		
Education Checker				SHMG Urgent Care - Beltline Avenue. 14 min - 9.0 miles.		
				SHMG Orthopedic Urgent Care - Lake Drive. 13 min - 9.3 miles.		
				Hold my place in line		
< •		• •				

The Capstone Experience

Spectrum Health Project Plan

Screen Mockup: Web Portal (Desktop)

SPECTRUMHEALTH	Filter		_	Log Out
	Type a condition, synonym, or Conditions	Synonyms	Service	Q
	Acne	Pimples × Hay Fever × Aversion × Allergic Reaction ×	MedNow ~ Choose A Service ^ MedNow	0
	Back Pain	Sore Back ×	Urgent Care Emergency Department	0
	PREVIOUS	NEXT	ADD CONDITION SAV	



Screen Mockup: Web Portal (Mobile)

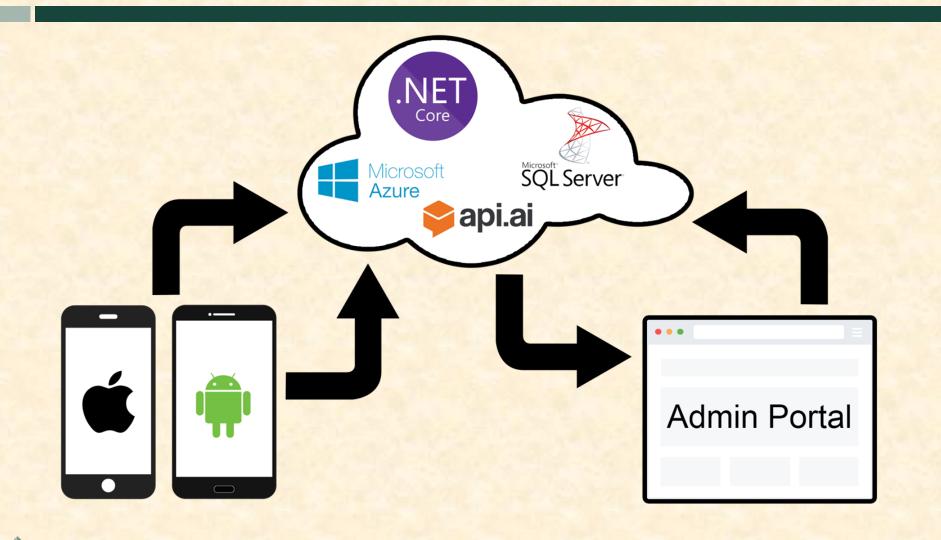
	Log Ou	
ïlter		
Type a condition, synonym, or service	Q	
Condition		
Acne		
Synonyms		
Pimples ×		
Service		
MedNow	~	
Condition		
Allergies		
Synonyms		
Aversion × Hypersensitivity × Allergic Reaction × Sensitivity × <td< td=""><td></td></td<>		
Service		

Technical Specifications

Front-End

- •iOS SDK (Swift)
- Android SDK (Java)
- Web-based administrative portal OHTML5, CSS3, ASP.Net Core 2.0
- Back-End
 - Net Core MVC (C#)
 - Entity Framework Core
 - Microsoft SQL Server

System Architecture



System Components

- Hardware Platforms
 - iPhone 5 iPhone X
 - Android devices 4 years old
 - Desktop and Mobile (Web)
- Software Platforms / Technologies
 - •iOS 10.3+
 - Android 4.4 (KitKat) 8.0 (Oreo)
 - Modern web browsers
 - ○IE 11, Edge, Chrome, Safari, and Firefox

Testing

- iOS Testing
 - •iOS Unit testing and UI testing done with Xcode.
 - Test builds deployed to actual devices with TestFlight
 Android Testing
 - Tests created with Android Testing Support Library.
 OUnit tests built with JUnit and Mockito framework
 OIntegration tests built using JUnit with Espresso
 - •.Net Core Testing
 - Testing done using XUnit and Postman

Risks

- Symptom Mapping/Accuracy
 - Implement a NLP system to take symptoms and map them to a Spectrum Health service as fast as possible with accuracy.
 - A member of our team has done research on algorithms, and has contact with professors in the fields of algorithms and ML.



Risks

- User Testing
 - We will conduct user testing to field test input methods for symptoms.
 - Most of the team has experience creating mobile applications and they are bringing forward UX knowledge from previous jobs.



Questions?

