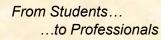
MICHIGAN STATE UNIVERSITY Project Plan Self-Improving Assistant The Capstone Experience

Team Vectorform

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Functional Specifications

- Chatbot that answers user queries
- Integrated into Microsoft Teams
- Eliminate help desk associate connection times

Design Specifications

- Adaptive Cards on teams for text, input, buttons, sign in
- Human fail-safe add on to chat
- Human-like bot personality
- Extract question and answer pairs from files or URLs

Screen Mockup: Successful Q&A

< >		Q Sear	ch			×
L Activity	Chat 🗸	7 Ø	UB	FAQ UserBot		
	∀ Recent					
E Chat	FAQ UserBot		UB	FAQ UserBot 2:50 PM Hello, this is UserBot. Ask a question to start.		
Teams					2:50 PM where can I buy masks?	
Calendar			UB	FAQ UserBot 2:50 PM Here is what I found: List of stores with masks Click to go to page		
Apps						
?			Type you	r question here		
Help			A_ 😳	···· ۲ 🖓 😳 ۱۱۰		E

Screen Mockup: Unsuccessful Q&A

$\langle \rangle$		Q Sear	ch	×	
L Activity	Chat 🗸	7 Ø	UB	FAQ UserBot	
	∀ Recent				
– Chat	FAQ UserBot			2:50 PM What is the recommended distance to keep from people?	
Teams					
Assignments				EAO UserBot 2:50 PM We could not find a match to your question	
Calendar			UB	Open chat to Human Service	
•••					
Apps					
?			Type your	question here	
Help			A₂ ∵:	ifi i⊋ i⊳ Ω ····	>

Team Vectorform Project Plan Presentation

Screen Mockup: Human Helper

$\langle \rangle$	Q	Search	×	
L Activity	Chat Y 🖓 🖟		FAQ UserBot	
reavity	∀ Recent			
E Chat	FAQ UserBot		2:50 PM What is the recommended distance to keep from people?	
Teams Teams Assignments Calendar		UB	FAQ UserBot 2:50 PM We could not find a match to your question Open chat to Human Service FAQ UserBot 2:50 PM Connecting to Human Service FAQ UserBot 2:50 PM Hello, I see that you wanted to know the recommended distance for social distancing? Is that correct?	
Apps				
?		Туре уоц	r question here	
Help		A_ 😳	eff 记 P ♀ … ₽	≥

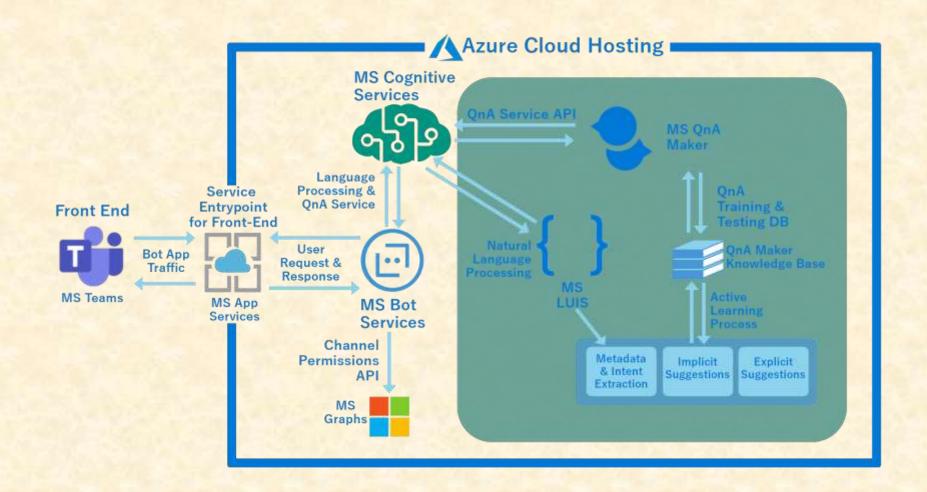
Screen Mockup: Cards Input Answer

$\langle \rangle$	Q Se	arch		⊐ ×
L Activity	Chat ~ 🛛 🖓 🖄	UB	FAQ UserBot	
	▼ Recent			
– Chat	FAQ UserBot		2:50 PM Thank you. Goodbye.	
Teams Assignments Calendar		UB	FAO UserBot 2:50 PM Suggestion: How would you rate your experience? Rate O Unsatisfactory O Kay Good Awesome Comments: Submit	
?		Type you	ur question here	
Help		A₂ ☺	ା ଗମ୍ମ 😳 🏷 ନୁ ···	

Technical Specifications

- Microsoft Bot Framework and Microsoft Graph used for front-end functionality
- Azure as an App Service hosts the back-end system
- The Azure as an App Service hosts the further services: Microsoft Cognitive Services and Microsoft Bot Service
- Cognitive Services is used for its QnA Maker service, which is used as an endpoint for query strings and responses to the bot
- Cognitive Services also includes LUIS, which is Language Understanding service used to determine intent
- Bot Service acts as an endpoint between the user and the QnA Maker, allowing full function

System Architecture



System Components

- Hardware Platforms
 - Microsoft Azure Cloud Hosting
 - Any device capable of running Microsoft Teams
- Software Platforms / Technologies
 - Front End Components
 - Microsoft Graph API
 - Handles permissions for Microsoft apps
 - Microsoft Bot Framework
 - Specialized chat-bot SDK for Teams
 - .NET Core 3.1, C#
 - Visual Studio 2019
 - Adaptive Cards Schema
 - Implemented within Bot Framework, provides a customized form capable of interaction, written in JSON
 - Back End Components
 - Microsoft Bot Services (Microsoft App Services)
 - Used to register bot created for teams within Bot Framework
 - Communicates with both Front and Back End through API calls
 - MS Cognitive Services
 - Umbrella service responsible for learning capabilities
 - Microsoft LUIS
 - » Determines intent of the question, and processes metadata
 - Microsoft QnA Maker
 - » Provides database of question and answer pairs, applies machine learning techniques to incoming strings, and utilizes active learning to improve the dataset

Risks

- Data Quality
 - Description: The data being used to train the assistant may be poor in quality, leading to unwanted and unnecessary assistant function.
 - Mitigation: Continually test for unwanted function during prototyping using various types of known-bad data to identify conditions causing said functionality.
- Allow Any Administrator to Use Data of Any Size
 - Description: Any administrator should be allowed to upload a data source of varying size whether it be kilobits or terabytes.
 - Mitigation: Parse and test various example data sources of varying sizes.
- Azure Cloud Management
 - Description: Configuration and coordination of the suite of Azure Cloud Services relies on a lot of hosted services working together with a high level of abstraction, I.E. it is hard to make simple changes to components.
 - Mitigation: An iterative design process based on early prototyping making use of all relevant systems.
- Speech Functionality Feature
 - Description: Allowing users to use speech to ask questions is a stretch goal relying on every other main feature being successful, and a challenge learning to navigate another set of Microsoft service.
 - Mitigation: Plan to get a successful build of the bot deployed and assign tasks to research additional services to implement speech to text technology.

Questions?

