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
Screen Mockup: Unsuccessful Q&A
Screen Mockup: Human Helper

FAQ UserBot

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?

Type your question here
Screen Mockup: Cards Input Answer
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?