Engineer Me Chatbot
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Abstract
Engineer Me Chatbot is a conversational software application that mainly serves as an acronym expander. It targets college-level engineering students who encounter acronyms daily. This interactive bot gathers plenty of user feedback at multiple stages of the conversation to ultimately return the correct expansion. The bot is being built on Microsoft Teams & other commercial messaging platforms. It comprehends the user acronym intent where it expands the acronym and allows the student to view the full technical definition, videos containing formulas & solved examples on the jargon, alongside books that have any mention of the acronym. Overall, this bot enhances the students overall learning experience and reduces resources referrals.

Introduction
Acronyms are widely used in the field of studying Engineering where students use acronyms in both technical writing and courses to save both time & space when referring to lengthy technical terms. Mainly students rely upon search engines (Google, Bing, Yahoo, etc.) to expand these acronyms, however, there are some disadvantages that come along. These engines:
- Return non-educational results causing more irrelevant data = lower query accuracy & relevancy
- Lacks conversational format & provides no user feedback mechanism
- Contain distracting advertisments displayed alongside results

Taking these drawbacks, the main objective was to create a chatbot that increases time efficiency by reducing the student’s average time on researching. In addition, it aims to provide an engaging conversation with the student through constant feedback.

Features
- The device is compatible with all macOS/Android devices
- Bot is built on Microsoft Teams and other commercial messaging platforms
- Action menu allows viewing the following:
  - Full expansion
  - Technical definition/meaning - functioning as a dictionary
  - Videos that would contain formulas and solved examples on the acronym
  - Books & publications on the acronym
- It’s programmed on a user feedback mechanism & operating in a waterfall format
- Offers a user manual that contains step by step instructions
- Delivers a quick response within 10-15 seconds

Algorithm Flowchart

Figure 1: Holistic bot response logic with detailed possible paths based on user input

Architecture/Technology

Front end: User Interface and what is displayed to the user
- Users need to sign in or sign up for Microsoft Teams (have a working personal registered account)
- Constant user feedback questions where answers are stored locally

Bot framework service (from azure):
- Main connector between front & back end

API Services:
- Four trustworthy Application Program interfaces (APIs) are called upon in the code based on the action selected from the user:
  - STAND4 Abbreviations API – provides full expansion of the acronym
  - MediaWiki API – used to extract technical definition/meaning of the acronym
  - YouTube API – returns any videos that include the acronym
  - Google Books API – returns any books that have any mention of the acronym

Results
- Code logic tested and debugged using the bot framework emulator
- Many critical features are tested & completed + functioning properly including:
  - category menu & action menu
  - user acronym type & letter validation
  - loop and stop (1st path)
  - ending command path & farewell
- The bot is currently connected and calls upon 3 APIs (Abbreviations API, Mediawiki, YouTube) based on user action and acronym input.
- Google books API corresponding to books returning any books that have any mention of the acronym

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