Senior Honors Projects   Honors Program at the University of Rhode Island

2019

University of Rhode Island Course Information Assistant

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Software Requirements Specification

for

URI Course Catalog

Version 1.2 approved

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University of Rhode Island

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Table of Contents

https://github.com/DanielGauthier8/uri_course_catalog_backend

Revision History

Name	Date	Reason For Changes	Version
Daniel Gauthier	3/14/19	Introduction added	0.1
Daniel Gauthier	3/25/19	Added Other Requirements, Other Nonfunctional Requirements, External Interface Requirements, and Overall Description	0.2
Daniel Gauthier	4/03/19	Changed formatting version from 1999 to 2013	0.3

Daniel Gauthier	4/15/19	Added functional requirements	1.0
Daniel Gauthier	4/17/19	Formatting corrections	1.1
Daniel Gauthier	4/22/19	Formatting corrections	1.2

1. Introduction

1.1 Purpose

The purpose of this document is to describe the Google Action, URI Course Lookup, including its dependencies and functionalities. Any constraints of the system will also be listed. The document will only talk about this specific subsystem of this one Google Action. There are many capabilities of the Google Assistant ecosystem and it is noted that not all functionalities in the larger system work on this smaller subsystem.

1.2 Document Conventions

This document is using the standards and conventions of the Institute of Electrical and Electronics Engineers System Requirements Specifications convention. All readers of the document would be assumed to understand this familiar vernacular.

1.3 Intended Audience and Reading Suggestions

This SRS document has been made for other developers as well as users interested in product details. The document has been separated into seven separate parts. This includes Introduction, Overall Description, System Features, Data Requirements, External Interface Requirements, Internationalization and Localization Requirements, and Other Requirements. The large sections will be further split up by subsection in their respective groupings. The introduction should be read by anyone who plans to read this document. For users, the section on System Features would be recommended. This section pertains to all functionalities of the scoped product. Additional functions will be updated in this section as well. Developers would be recommended to read Data Requirements and External Interface Requirements. The back-end developer would focus on Data Requirements and front-end would focus on External Interface Requirements. The Data Requirements section largely explains the back-end description of how the product operates. Front end developers should reference External Interface Requirements as it pertains to information needed to know for what devices the software can run on.

1.4 Project Scope

URI Course Catalog is a Google Action that can be run on any Google Assistant device. The program lives in the cloud and relies on the internet for a user to interact. Functionalities depend on the Google Assistant device, a fire-base JavaScript back-end, and the University of Rhode Island's eCampus API. Distribution is done on the Google Assistant Actions Store as well as an implicit reference when communicating with the Google Assistant.

1.5 References

Google Actions Documentation:
https://developers.google.com/actions/reference/nodejsv2/overview

Google Firebase Documentation:
https://firebase.google.com/docs/

University of Rhode Island eCampus API Documentation:
https://api.uri.edu/#/docs/catalog

University of Rhode Island eCampus API Documentation:
https://api.uri.edu/#/docs/catalog

2. Overall Description

2.1 Product Perspective

URI Course Catalog is a Google Assistant Action that is capable of looking up course information of any live University of Rhode Island Course. This is part of the larger Google Actions ecosystem, which a user can explicitly ask to start an action, or Google Assistant may make the assumption the Action is being called and forward other user queries to the system at large and response with the output of this application.
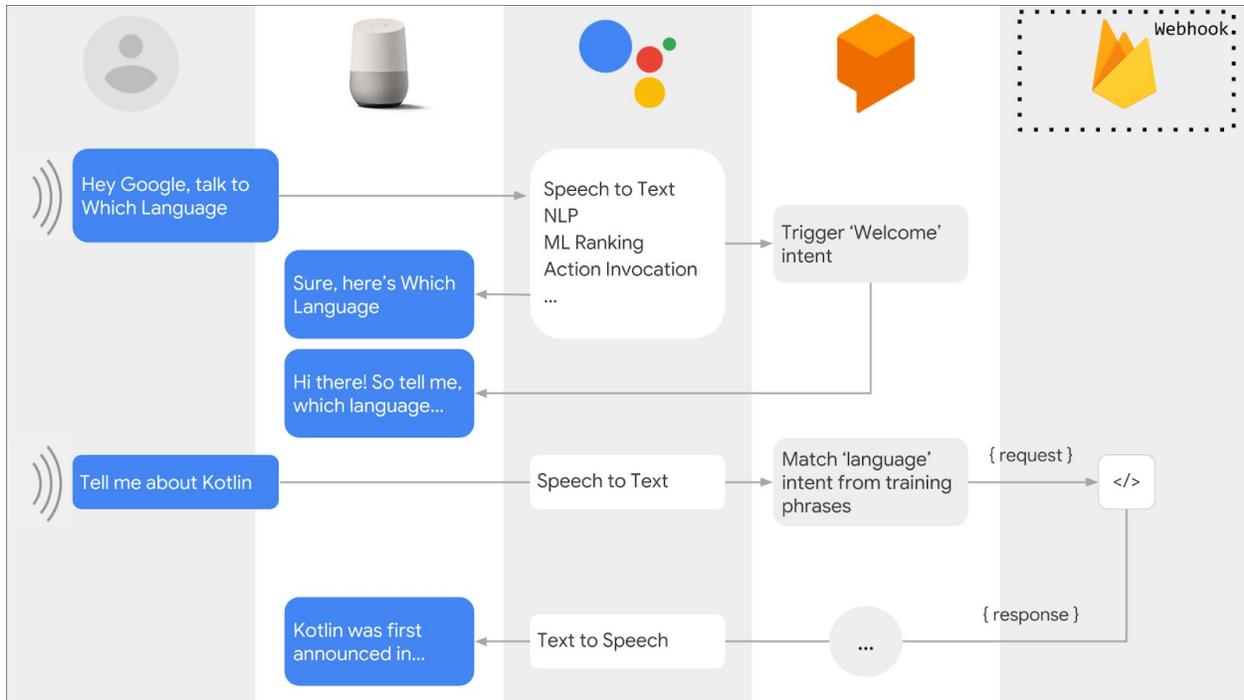
This is an interaction with the Google Assistant. This shows each dependency of each subsystem needed to supply an Action response. Source: Link

2.2 User Classes and Characteristics

- Courses query of one subject in a range.
- General University of Rhode Island frequently asked questions.
- Courses query of one specific course.
- The programs sources of information.
- Application help information
- Small talk

2.3 Operating Environment

This Action must work with Google's current Cloud API. The application is currently written to work in API version 2. This is written for requests and responses.

2.4 Design and Implementation Constraints

All user documentation for usage of the application can be found in the help section of the user agent. This responds with the following:

"You can say things such as, 'look up math 141' or 'search for a computer science course between 200 and 300'. I can understand complex sentences, as well as ask for information you may have

not included. In addition to course information, I can answer common frequently asked questions about URI What can I help you with?”

The user will get a response as long as their query is close to the documented query. The system will ask follow up questions if a part of a query is understood, but other parts of it were not recognized or not provided.

3. System Features

3.1 Specific Course Lookup

3.1.1   Description

High Priority. As a user, I can get information on any live University of Rhode Island course. This information would include, a short description of the class, class title, college the class is in, prerequisites, and the number of credits.

3.1.2   Stimulus/Response Sequences

To access this feature, a user must provide a course subject and course code. If the user asks for this feature and does not include the course lookup information the program will prompt for it. This request must be made while the program is not already prompting for another query and can be asked after a query has been completed.

3.1.3 Functional Requirements

The program takes what the user provided and makes a “guess” what the user is querying for. The program must be able to handle courses that do not exist as well as courses with multiple classes per course code. A noticeable example of this would be honors courses.

3.2 Range Course Lookup

3.2.1   Description

High Priority. As a user, I can get a list of all courses in a range of course codes. This list would include the course title and matching it with it's corresponding course code. This information could then be used to look up a specific course.

3.2.2   Stimulus/Response Sequences

To access this feature, a user must provide a course subject, minimum course number, and maximum course number. If the user asks for this feature and does not include the course lookup information the program will prompt for it. This request must be made while the program is not already prompting for another query and can be asked after a query has been completed.

3.2.3 Functional Requirements

The program must be able to take what the user provided and make a "guess" what the user is querying for. The program must be able to handle ranges where courses do not exist, as well as courses with multiple classes per course code. A noticeable example of this would be honors courses. On the audio-only devices, the program must portion out the courses to a limited range, to help with memorization.

3.3 Specific Level Course Lookup

3.3.1   Description

Medium Priority. As a user, I can type in a class subject and a course level and receive back all courses in this range. This information would include the course title and matching it with it's corresponding course code. This information could then be used to look up a specific course.

3.3.2   Stimulus/Response Sequences

To access this feature, a user must provide a course subject and a course level. If the user asks for this feature and does not include the course lookup information the program will prompt for it. This request must be made while the program is not already prompting for another query and can be asked after a query has been completed.

3.3.3 Functional Requirements

The program must be able to take what the user provided and make a "guess" what the user is querying for. The program must be able to handle ranges where courses do not exist, as well as courses with multiple classes per course code. A noticeable example of this would be honors courses. On the audio-only devices, the program must portion out the courses to a limited range, to help with memorization.

3.4 Frequently Asked Questions

3.4.1 Description

Low Priority. A user can get information on general questions about the University. This information would be limited to frequently asked questions found on the University of Rhode Island's website. This feature currently includes information on, academic advising, CELS college, commuter housing, dining services, emergency services, facilities, health services, housing, J-Term, new students, online courses, Ram Hacks, and prospective students.

3.4.2 Stimulus/Response Sequences

To access this feature, a user has to ask a question that has an answer in it's frequently asked questions bank. Topics of these question are found above. This request must be made while the program is not already prompting for another query and can be asked after a query has been completed.

3.4.3 Functional Requirements

The program must be able to take what the user provided and make a "guess" what the user is querying for. The program must continue to crawl it's provided sources to make sure information is up to date.

3.5 Help

3.5.1 Description

Provides instruction on how to use the application. The help functionality provides the range of things a user can ask for and then gives examples of each.

3.5.2 Stimulus/Response Sequences

When a user asks the program for help or gives a complaint they will get the help response. This request must be made while the program is not already prompting for another query and can be asked after a query has been completed.

3.5.3 Functional Requirements

This must provide correct example queries to the user.

3.6 Sources

3.6.1   Description

Medium Priority. List to the user what sources are used to provide the answers to their questions. The source, a link, and a description is provided for each listed item.

3.6.2   Stimulus/Response Sequences

The user has to explicitly ask the program what it's sources are or just say the word sources.

3.6.3 Functional Requirements

Links to sources must stay up to date.

4. Data Requirements

4.1 Reports

The application generates a report for every conversation it has with the end user. What the user said and how the program identified the input is included in a report.

4.2 Data Acquisition, Integrity, Retention, and Disposal

All conversations are stored for history, training, and analytic proposes.

5. External Interface Requirements

5.1 User Interfaces

The interface is consistent in using google-actions styling for buttons, font, and background color. The chosen primary color is #002147, following the University of Rhode Island's dark blue primary coloring. The logo of the application can be found below.

Responses for queries referring to courses in a range respond with a random image of the University of Rhode Island Kingston Campus, followed by the range provided by the user. This is then preceded by a subtitle of the college of the courses being researched. Finally, this ends with a list of the course, and it's course code. At the bottom of this card is a link to login to eCampus. A screenshot of the response is provided below.

Responses for queries referring specific courses will respond with a random image of the University of Rhode Island Kingston Campus, followed by the course name. This is then preceded by a subtitle of the college of the courses being researched. Finally, this ends with a groomed version of the API's response of the course description. At the bottom of this card is a link to login to eCampus. A screenshot of the response is provided below.

Honors Project
College of Arts and Sciences

(3 Credits) (Independent Study) Prerequisites: permission of the director of the Honors Program, and overall GPA of 3.40 or better.

→   **eCampus**

On launch, if the Action is explicitly invoked the Action will welcome the user in a text or audio-only format. The program welcomes the user, preceded by example queries they can ask. A screenshot of the response is provided below.

Talk to uri course catalog

Hello and welcome to URI Course Catalog!
You can look up things such as courses of a subject in a range, specific courses, and answers to frequently asked questions.
What can I help you with?

5.2 Software Interfaces

Back-end web hook runs on run-time Node.js 8 with 256 MB of memory. It times out in 60 seconds. It is hosted on Google's Firebase on a blaze account. Dialog-flow V2 is used for hosting intents and is responsible for forwarding requests to the web hook service.

5.3 Hardware Interfaces

Action has currently been approved for use on Smartphones, Speakers (e.g. Google Home), Smart displays (e.g. Google Home Hub), Android TV, Android Auto, Wear OS devices (e.g. watch), Assistant-enabled headphones, and Chromebooks. These devices vary and can include visual interfaces, touchscreens, audio input, and audio output. When a display is present it is assumed the display is touch capable or has another selection tool such as a mouse. When a display is not present the application will change interactions to a more audio friendly interaction, explaining more auditorily than on visual interfaces. Visual interfaces may have audio input and output on or off, having integration over text when this feature is not active.

AVAILABLE DEVICES

Android 6.0+ watches

Android 6.0+ TVs

Google Home

Android 5.0+ phones

iOS 10.0+ devices

Headphones

Chromebook

Smart Displays

Android 6.0+ tablets

Current devices that may work, and are included in the Google Assistant Domain can be found at: https://assistant.google.com/platforms/phones/

5.4 Communications Interfaces

According to Google, communication is done encrypted from the Google Assistant device to their back-end servers. This is then forwarded as JSON files over HTTPS to a Firebase function server. All communication back to the user is done in this same format.

6. Quality Attributes

6.1 Usability

Responses are consistent and the help command can be issued at any time during the interaction.

6.2 Performance

There are currently no performance requirements for this Google Action. All Google Assistant devices are able to invoke this Action.

6.3 Security and Privacy

<div align="center">

URI Course Catalog Privacy Policy

</div>

This privacy notice discloses the privacy practices for the URI Course Catalog action on 'Actions for Google'. This privacy notice applies solely to information collected by this website. It will notify you of the following:

1. What personally identifiable information is collected from you through the website, how it is used and with whom it may be shared.
2. What choices are available to you regarding the use of your data.
3. The security procedures in place to protect the misuse of your information.

Information Collection, Use, and Sharing

We are the sole owners of the information collected on this site. We only have access to collect information that you voluntarily give us via email or other direct contact from you. We will not sell or rent this information to anyone. All queries are logged for action training, history, and analytics. Any failed query to the URI servers are also logged for debugging.

We will use your information to respond to you, regarding the reason you contacted us. We will not share your information with any third party outside of our organization, other than as necessary to fulfill your request, e.g. the University of Rhode Island's servers for course lookup.

Security

We take precautions to protect your information. When you submit sensitive information via the website, your information is protected both online and offline.

Wherever we collect sensitive information, that information is encrypted and transmitted to us in a secure way. At the time of this writing, Google Assistant traffic is being encrypted by Google.

While we use encryption to protect sensitive information transmitted online, we also protect your information offline. The computers/servers in which we store personally identifiable information are kept in a secure environment.

If you feel that we are not abiding by this privacy policy, you should contact us immediately via email.

Privacy Policy Template

https://www.bbb.org/greater-san-francisco/for-businesses/toolkits1/sample-privacy-policy/

6.4 Safety

This product's safety directly relates to the hardware the application is run on. All control of the product including sound level and display movement is controlled by the users personal Google device.

6.5 Software Attributes

URI Course Catalog Terms of Service

Please read these terms of service ("terms", "terms of service") carefully before using this Google Action operated by Daniel Gauthier.

Conditions of Use

We will provide services to you, which are subject to the conditions stated below in this document. Every time you visit this application or use its services, you accept the following conditions. This is why we urge you to read them carefully.

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Before you continue using our website we advise you to read our privacy policy regarding our user data collection. It will help you better understand our practices.

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The entire communication with us is electronic. Every time you send us an email or visit our website, you are going to be communicating with us. You hereby consent to receive communications from us. You also agree that all notices, disclosures, agreements and

other communications we provide to you electronically meet the legal requirements that such communications be in writing.

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Google reserves all rights to terminate accounts, edit or remove content and cancel orders in their sole discretion.

Terms of Service Template

https://www.websitepolicies.com/blog/sample-terms-service-template

7. Internationalization and Localization Requirements

This product is intended for use of students at the University in Rhode Island. With this in mind, the application is only available in the United States. The application will work in any English speaking country, but with Google Assistant's machine learning current abilities it has been deemed that release of this product in all English speaking countries would cause more accidental invocations of the Action.

Appendix A: Glossary

The following terms are used consistently throughout this document to describe the interactions with the Google Assistant environment:

- Visual-interface: Devices that are capable of showing visual output. This would include screened devices
- Audio-interface: Devices that are typically only capable of communication using audio. Devices with visual output are typically also capable of audio interfacing.
- Intent: A request or task a user can ask the software.
- Action: The entire software application interacting with the user. Can contain multiple Intents.
- Response: A visual or audio response back to the user after calling an Intent.
- Simple Response: A response to the user that includes text and SSML styled audio. The text and audio can be different, catering to the expected answer common styling.
- Browse Carousel: A list styled response with only visual elements. Can include links, text, subtext, buttons, and images.
- Explicit invocation: To ask the Google Assistant to launch an action. For example, "Okay Google, talk to URI Course Catalog". May also refer to as "invocation."
- Implicit invocation: Links deeper into an Action, skipping the welcome message. For Example, "Okay Google, ask URI Course Lookup for information on CSC 440."
- Small Talk: Custom responses to casual conversation. For Example, "What is your birthday?" or "I'm hungry."

Appendix B: Analysis Models

Use Case Diagram:

Action Diagram: