Google Calendar Assistant

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1 Repository

Schematics, diagrams and codebase are contained under the following git repository:
`https://github.com/MihaiCania/MSProject`

2 User requirements

1. The system must have access to Google Assistant API.
2. The system must have access to Google Calendar API.
3. The system must be able to get the events from Google Calendar.
4. The system should get information every minute from the Google Calendar regarding the events.
5. The system must inform the user regarding the upcoming events.
6. The system must use sound notification.
7. The system should run in an environment that provides a 24/24 access.

3 System overview

The overview of the system is depicted in Figure 1.

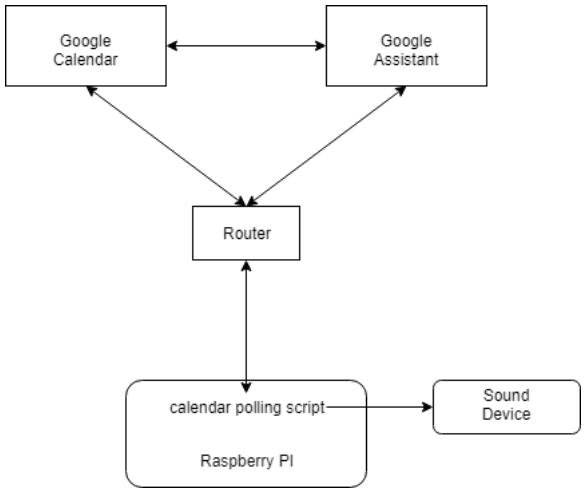

Figure 1: System overview diagram

The Raspberry PI communicate via WIFI with the Router in order to have access to the internet.

Calendar polling script have the responsability to pull events from Google Calendar every minute and if the event starts in the following 10 minutes then the user will be notify by a sound.

Google Assistant is integrated in the system and the user can add new calendar entries simply by speaking to it.

Google Assistant and Google Calendars communicate one with each other and the calendar entry will be visible in the calendar.

4 Circuit design

The hardware view of the system is represented by a Raspberry PI 3 Model B+.

It is mandatory to have a microfone connected via USB to the Raspberry PI.

A sound device must be connected also via USB, AUX or HDMI.

It is mandatory to have a microfone and a sound device connected in order to communicate with Google Voice Assistant whose job is to help the user with answers to questions and also to be able to add calendar entries. The sound device is used to notify the user if there are upcoming events in the following minutes and to remind the user to check the calendar.

5 Software design

The software components and data flow directions are depicted in Figure 2. Each of these will be presented in the following subsections.

5.1 Python modules

gcalnotifier.py: it retrieves the calendar entries from Google Calendar every minute and notify the user if there are events that starts in the following 10 minutes.

get_credentials(): create the credentials in order to access Google Calendar and Google Assistant using the auto-generated file from Google.

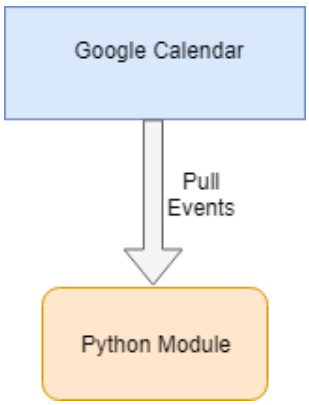

Figure 2: Software entities involved

has_reminder(event): returns True if there's a reminder set for the event.

get_next_event(search_limit): get all the events on the calendar from now through 'seach_limit' minutes from now.

main(): infinite loop to continuously check Google Calendar for future entries and if there are any notify the user how much time is left until the event starts. It does 3 notifications, one for 10-5 minutes remaining, one for 5-2 minutes remaining and a less than 2 minutes remaining.

5.2 Google Assistant

The software use the default Google Asistant for Raspberry PI project from `https://developers.google.com/`

6 Results and further work

The current version of the project supports the following functionalities:

- reliable calendar entries polling
- notifications via HDMI sound card
- Google Assistant functionalities
- add calendar events using Google Assistant

The following list of extensions and improvements was identified to be supported in the future:

- AUX or USB sound card notification (no dependency of a monitor)
- custom calendar view using an old monitor (can be mounted on a wall)

- custom notification for every event (using TTS to notify the event title)

7 References

1. Draw IO, https://www.draw.io/
2. Google Assistant SDK, https://developers.google.com/assistant/sdk/guides/service/python/embed/audio
3. Google Calendar API, https://developers.google.com/calendar/quickstart/python