

UNIVERSITY OF GRONINGEN

SOFTWARE ENGINEERING

Evidencio

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1 Introduction

Evidencio is an open library that holds quality-controlled medical prediction models and is continuously growing. These prediction models can be used to translate results from clinical studies towards patient-specific probabilities, therewith supporting medical decision-making for individual patients. These models are used by medical professionals to aid the prognosis of a medical condition and treatment for individual patients.

As of now its user-base consists only of medical professionals, one of our goals of the project is to design a front-end platform for patients. To represent Evidencio calculated models to patients in a friendly and understandable way, this will be done by making the input variables for the calculation of the models in to a workflow questionnaire that patients can easily follow. At the end patients should be able to see the result of the specific Evidencio probability models, calculated on their medical conditions in an understandable graphical representation. The other goal for the project is to create an environment for medical professionals to create and edit these workflows based on the models developed on Evidencio.

2 Terms

1. **Workflow:** Decision-tree like flow-model made by medical specialist for patient
2. **Step:** Level in the Workflow. Each workflow can have several steps (levels), after which the final result is reached
3. **Option:** Point in workflow that could possibly be reached by the patient at some point, are part of steps (as in, each step has one or more options that could be reached)
4. **Types of Options:** Result-option (used for showing final results), Input-option (used for requesting extra input from patient)

3 Functional Requirements

3.1 Critical

- Fill in workflow model

- Patient user should be able to search for and complete selected workflow models
- Display workflow results in a graphical representation
 - Completed workflow models should display result in a graphical representation
- Design/create workflow model
 - Medical professionals should be able to design and create workflow models and be saved in a database
- Log-in for medical professionals for creating workflow model
 - Medical professionals that want to create or edit workflow models need to first register and be verified by an administrator
- Communicates with Evidencio API for possible results
 - Models should get the results calculated through API connection with Evidencio API
- Create workflow model: Medical professionals should be able to create a new
 - Manage steps
 - * Steps can be added, edited, deleted
 - Manage options
 - * Options can be added, edited, deleted
- Show the overview of the workflow
 - For both the workflow creation and verification you have to be able to see the overview of the workflow
- Show details of an option
 - Show the overview of a single option. This shows the variables, logic and connecting options for this option

3.2 Important

- Verify completed models before making them available for patients
 - Verification is important to ensure the quality of the workflows

- Download results of workflow in pdf-file
 - Users that have completed workflow models are capable of downloading the results of the model as a pdf
- Edit workflow model
 - Designers can edit the workflow and add
- Edit medical professional's account data
 - Registered medical professionals can edit their personal data
- Data input method dialogue
 - The designer can pick a method of inputing data (e.g. slider, text box, radio box, etc.)

3.3 Useful

- Expanding the app with the patient front-end
 - Possibly make an expansion with the patient interface for the currently existing Evidencio app
- Delete medical professional's account
 - Have a possibility to delete existing account of a medical professional
- Delete workflow model
 - Have a possibility to delete existing workflow model
- Add brief workflow model description
 - Have a description of a model which can help all users of the systems
- Edit brief workflow model decription
 - Edit the existing brief workflow model description
- Save workflow as a draft
 - Save the workflow on which the user is currently working as a draft in order to have the possibility to work on it in multiple sessions

- Grant and revoke permission to review workflows and new users
 - Granting and revoking permission to users to review workflows and new users in order to expand the team of reviewers
- Feedback for Models
 - A way to let patients provide feedback based on their experience with the model

4 Non-Functional Requirements

- Security
 - Communication should be secure (i.e. the patients' privacy must be guaranteed)
- Privacy
 - Patient's information of the resulting model will not be saved
- User friendly
 - Simplicity - website should be easy to understand and flow
 - Responsive design
- Usability
 - The system must be usable
- Speed
 - The system must be fast
- Availability
 - Website should function on browser IE11
- Open Source
 - The system must be open-source for future development

5 Won't Do

- Integration into other medical systems

6 Meeting Log

6.1 First meeting (28-02-2018)

Main Goals

Currently, Evidencio is focused for the use by medical professionals/health-care personal. However, it can also be valuable tool for communication with patients, but it will have to be understandable and personalized for the patients. The goal is to design and create an open-source stand-alone patient interface, through which the patient can fill in their own data/used medication/etc. Personalised and simplified models for the patients can then be used, specifically based on the data entered. The Evidencio API can be used for these models. The tool is meant to be a self-help tool.

Plan

Start with the structure of the application (rough idea, Course Design Document, will be sent later), the actual models will come later. We are going to work in PHP, specifically the Laravel Framework.

Monday (05-03-2018) some/most of us will travel to Haaksbergen to meet with the developers. We will have to decide on a time, but 1PM seems to work best for most of us.

6.2 Second meeting (05-03-2018)

In this meeting we focused on understanding the goals of the project precisely and agreeing on the technical requirements.

Goals of The Project

Since Evidencio is currently aimed at the medical professionals and the given models are not suitable for patients. The percentages are not easily understandable and something more efficient is needed.

The main team of developers is solely focused on the core platform, so we are asked to expand on their idea.

Goal of the project was defined as making a platform which on one side provides the ability for medical professionals to design the patient-friendly representations of the models, and on the other side provides the place for patients to fill the models made in the designer side and receive understandable feedback.

The project is to be available on GitHub upon completion so that other developers can expand it and integrate it into different systems.

Technical Requirements

Mainly we have discussed the way to design the system and which approach to use. As mentioned above, the system will consist of two main parts. The patient, and the designer side. In the core of the system, a rule engine will be implemented. This is for future development. Along with this, a database needs to be implemented and the system needs to contact the Evidencio API.

For the languages we have agreed on PHP, and for the database on MySQL. We have agreed that we can use any technologies and libraries as long as they are open source and can be accessed by developers who will be working on this project in the future. Also, the we will need to make the system such that it can support multiple natural languages in the future.

Furthermore, it was left to us to think of a good way to represent the data, and we were told to focus on the technical, and not on the medical part. Also, a disclaimer similar to that on the Evidencio website needs to be added.

Plan

After the end of the sprint (13-03-2018) we will provide the developers with the Requirements and the Design documents and will discuss upon it further. Furthermore, some of the developers will visit Groningen, and we will agree on the time and place for the next meeting beforehand.

In the meantime, they gave us permission to contact them if we have any question or need help.

7 Changelog

Contributors	Date	Section	What Was Done
All	27-02-2018	All	The initial document layout was added; Assumed requirements were added; Meeting log updated
All	13-03-2018	All	The layout was updated; Agreed requirements were added and the wrong ones were discarded; Meeting log updated