M-Government: Announce the birth/death of a person.

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Abstract

This report describes the design and the implementation of an Interactive Command Line Interface that can be operated using a smartphone or a similar device. The goal of this utility is to provide the final users (the citizens of a city) with the ability to exchange pieces of information with public offices without the need to move to another city. The tool is implemented in such a way that is easy to operate by users with different level of expertise in the tech field; however, a basic knowledge on how to operate a smartphone is still required. This report assumes that the users have access to a smartphone (or similar device) with a working Internet connection. The smartphone can be either a private one or a communal one [1]. It is also assumed throughout the report that the user already owns a set of credentials to identify themselves with the public service[2]; in addition to it, the public service already has all the necessary data about the user.

[1] A community smartphone is a device shared between different members of the same community.

[2] These credentials can be a username and password combination, or a fingerprint.

Chapter 1

Introduction

Background The number of people that have access to the Internet is continuously increasing; in 2016, 46.1% of the world population had a working Internet connection (3.424.971.237 people in total) and in 2018 this number increased to 4.072.057.869 (53.4% of current world population) [1, 3]. However, many official procedures, such as registering the birth or the death of a person, are still performed in the old way: the user is required to go to an office and personally sign the documents.

While going to an office in person can be a trivial task for people who live in modern cities with widespread public transportation, people living in rural and emerging countries might encounter more difficulties and dangers. For this reason, the introduction of a mobile application is a crucial step in developing or rural countries.

Tool The tool presented in the report introduces two different operating modes; one mode, called Guided Mode, that is conceived for casual users and offers a polished user interface with buttons and guidance. A second mode called CLI Mode, that is instead intended for proficient users and utilizes a standard Command Line Interface, directly embedded in the UI of the application.

A prototype of the tool is also available; in this prototype only the "Announce the birth" section is implemented. It is also assumed that most of the data are already known by the public office or can be inferred from the current user's data. The prototype is realized using Mockplus, available here: `https://www.mockplus.com/`. To try the prototype:

1. Download Mockplus from: `https://www.mockplus.com/`
2. Install it

3. Open the file project.mp
4. Click on the home page (top-left corner, under the main menu)
5. Press F5 to enter the preview mode

Chapter 2

Users

Skills and knowledge Despite the fact that the application was conceived to be as simple as possible to be used, a basic knowledge on how to operate a smartphone is still required. A small previous knowledge about terms related to the tech field, such as log-in, log-out, authentication, and similar ones, is also necessary.

Task The final goal of the user is to denounce the birth or the death of a person. In order to do that using the application, the user is required to reply to a set of standard questions; these questions are extracted directly from the official form present in the government website of Namibia. In case the person denouncing the birth is the biological father or biological mother of the child, some of the data might be already present in the database and will not be asked again.

Tools In order to accomplish the task a standard smartphone with an Internet connection is required. This device can be a private one or a communal one.

Chapter 3

Description of the application

As mentioned in the Introduction, the application can be operated in two distinct modes; Diagram 3.1 shows the flow of the application and highlights the interactions between the user and the application itself in the Guided Mode.

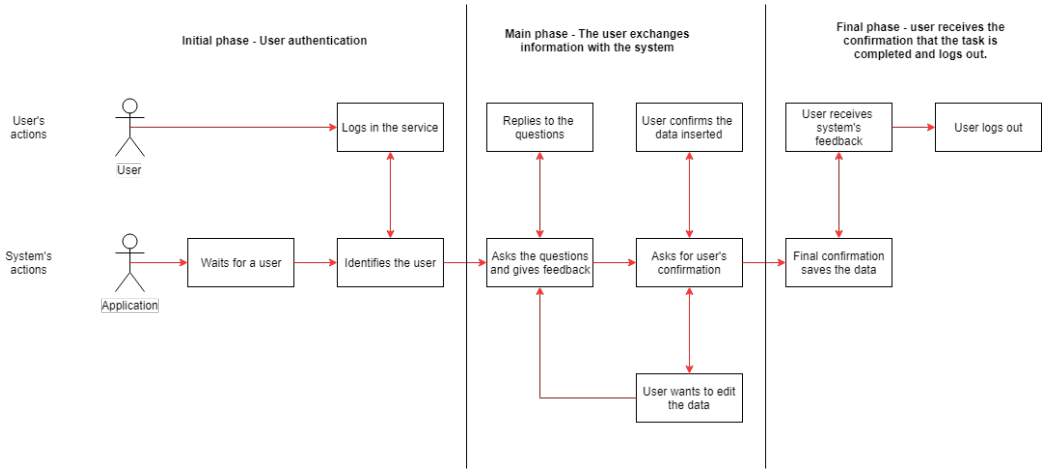

Figure 3.1: User-Application interaction (© Federico Macchi)

The whole process is divided into three main phases, user authentication, data exchange and a final recap phase where the user gives the confirmation and terminates the task. As it is possible to see in Diagram 3.1 the system acts as an active actor, asking for information and guiding the user throughout the process.

Interaction This tool presents a user interface defined as goal-based dialogs: the system guides the users using different kind of questions from the

beginning to the end. Advanced users can utilize this tool through a standard Command Line Interface (embedded in the UI) that accepts a single command; the parameters of this command are used to send the data. At the end of the process, either using the normal version or the CLI version, the user is presented with a final screen containing all the data acquired and has the possibility to edit this data (by repeating the whole process) or submit them.

UI Since the application is targeted at smartphones (or similar devices) the UI was conceived to work best on this kind of devices: multiple-choice questions always adopt buttons with the possible alternatives. Open-ended questions, on the other hand, benefit more from standard text input fields. The guided mode UI presents a single question for each screen, and always gives the possibility to go to the previous screen; in addition to it, each screen contains information related to the question.
Refer to the last Chapter, "Screen-shots", for some screen-shots of the interface.

Chapter 4

Guidelines

This section of the document describes the guidelines that are implemented. From Shneiderman et al. [4]:

- State and the alternatives should be visible
- Interface should include good mappings
- Continuous feedback

During the data acquisition phase in the Guided Mode, it is clearly stated how many questions have been answered and how many questions are still left. Multiple-choice questions always display possible alternatives. Each screen presents a coherent interface, with the question stated at the top and the button or text input field at the bottom. Important pieces of information are displayed in the middle area. Since the amount of data is relatively small, the application does not give feedback for each question, but gives a final recap screen containing all the collected data: from that screen is still possible to go back and re-start the process; using transitions and animations the tool gives the user visual feedback that the data are getting collected. This last guideline is not applicable to the Command Line Interface Mode, where the user inputs a single command and is immediately greeted by the final feedback page.

Some of the data entry guidelines [6] are also implemented:

- 1.0/1 Data Entered Only Once
- 1.0/4 + Fast Response
- 1.0/12 Feedback for Completion of Data Entry

Below there is a list of the data display guidelines [5] implemented:

- 2.0/15 + Consistent Grammatical Structure
- 2.0/16 Minimal Use of Abbreviation
- 2.0/20 + Minimal Punctuation of Abbreviations

Other sequence control guidelines [7] that applies are:

- 3.0/2 Minimal user action
- 3.0/3 Control Matched to User Skill
- 3.0/5 Control by Explicit User Action
- 3.0/18 Appropriate Computer Response Time
- 3.1.1/1 Question-and-Answer Dialogue
- 3.1.1/2 Questions Displayed Singly
- 3.1.1/3 Recapitulating Prior Answers

ISO [2] guidelines:

- Task suitability
- Self-descriptiveness
- Conformity with expectations
- Fault tolerance

Chapter 5

Screen-shots

The original .png files included below are available in the "screenshots" folder. Please note that all the data in the screen-shots are fictional.

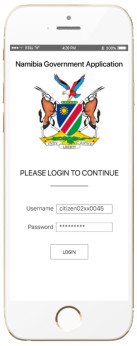

Figure 5.1: Log-in Page

Figure 5.2: Welcome page

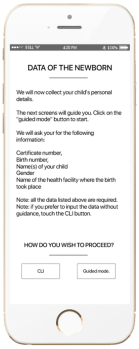

Figure 5.3: Birth Welcome Page

Figure 5.4: Open-ended question

Figure 5.5: Multiple-Choice question

Figure 5.6: CLI Mode

Figure 5.7: Final feedback page

Figure 5.8: Final page

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