

# **Assignment: Apply for a personal ID card**

## **CS-E5220 – User Interface Construction**

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In this document I provide the information on the background information regarding the assignment, which is based on my limited research. I then proceed to discuss several challenges and I provide a concept for a conversational user interface that tries to address them in addition to following relevant guidelines.

### **Background information**

The goal of this assignment is to create a conversational and interactive user interface that would allow a citizen of Namibia to apply for a personal ID card, either for the first time or a replacement ID in case that the original one was lost. Having an official government issued ID is mandatory by law and the citizens are required to apply for it when they are 16 years old.

Our target group consists of people who live in more secluded areas and travelling to government office is therefore a hassle as it means going to another city. Additionally, we do not expect these people to have a wide knowledge on how to use technology or digital services. They do not have access to a computer, but they can use a smartphone, which is shared by multiple users. In other words, they do not have their own.

Currently the citizens applying for an ID document are required to visit the nearest government office operated by MHAI (Ministry of Home Affairs and Immigration). There they would fill out a form. This is usually done by the government officer that asks the applicant questions and writes down the answers into the form. The reasoning behind is the minimization of errors in the process. Another concern is that not all of the applicants are literate, as we can tell by the option to put a fingerprint on the form instead of signing it. The fingerprints are collected directly onto the questionnaire in the form of physical scans using ink. As of now they are not recorded electronically, but the whole form is digitized by scanning it after it has been filled out (Pidatala, Harbitz and Hubbard, 2016). A photo that is required for the ID is also taken directly at the MHAI office.

There are other entities that collect citizens fingerprints, namely the Electoral Commission of Namibia (ECN), which does so for the purpose of voter registration, and the Namibian Police Force, that also records them digitally (The Namibian, 2016). These systems are not integrated but are instead self-contained.

Namibia is in the process of replacing old SWA ID cards for new Namibian ID's. The old ID's were made out of paper and had a low level of security, resulting in low trust. There is also a push to digitize government services as a part of the national e-Government Strategic Action Plan.

The turnaround time for the national ID cards fluctuates between 10 to 35 days and in the year 2015 approximately 9% of the printed ID's remained uncollected (Pidatala, Harbitz and Hubbard, 2016).

Following documents must be presented when applying for the ID for the first time (Government of Namibia, 2018):

- Application Form
- Original/full Birth Certificate
- Original Citizenship Certificate (Only People born outside Namibia)
- Marriage Certificate (Married Women only)
- Original Permanent Resident Permit (Permanent Residents only)
- Old Namibian ID (Only applicants in possession of an old ID)
- Fingerprints
- ID Photo

When applying for the first time, the application is free. So is the eventual correction of data if there was ministerial error. Image update or a duplicate ID are both subject to a fee of N\$ 50.

All applications are sent to the MHAI head office in Windhoek for processing. There, the fingerprints are matched against the existing entries in the National Population Registration System. The printed ID is then sent to the office where the application was submitted to be picked up by the applicant. (Government of Namibia, 2018)

## **Problems and challenges**

As the process aims to verify a person's identity, there are several security concerns that have to be taken into account. The need to collect the fingerprints is a good example of this.

If we were to collect the fingerprints remotely, two options come to mind. Firstly, there are the fingerprint scanners that are now common in smartphones. They however work differently when compared with the dedicated scanners, as they collect a set of partial scans instead one full scan of a fingerprint (Goel, 2017). This poses a security issue, as it is easier to fake. Another option is to send the fingerprints on a paper form by mail. This represents a small change from the status quo, as MHAI still uses ink to capture the fingerprints.

Both remote options however share a common risk as there is no way to ensure that the fingerprints submitted are truly belonging to the applicant. Moreover, it is a common practice even in the countries with most developed e-government systems such as Estonia, that it has to be picked up at a government office instead of being sent by mail in case of the application for first ID document.

As much as we want to make it easier for the citizen to obtain an ID card, we also have to keep the necessary measures in place and comply with the standards that exist in order to prevent identity fraud and falsification of official documents.

## **Description of the user and task**

I decided to have to example of users with different experience and tasks that they are trying to accomplish. Our user is a young Namibian about to get his first ID. He has experience using a smartphone but doesn't have one of his own. He is applying for the ID because his parents told him that he has to. They also help him getting the required documents. He heard from his friends that he can also apply online.

Second user is an aunt of the above-mentioned user. Her ID will soon expire, so she needs to get a new one. She lives in a very secluded place, so every trip is a lot of effort for her. She is happy to hear from her nephew who just got his first ID, that he only had to go to the government office one instead of the twice like she had to last time. But she doesn't understand how it works nor does she know how to use a smartphone. Luckily though, her nephew can help her with that.

## **Solution**

I choose to settle on adjusting the process so that it would only be required to visit to the MHAI office once instead of the two trips that are needed now. I feel that eliminating the need to go to the office twice will be beneficial to both the user, as it will be more convenient, and to the MHAI employees as it should decrease their workload.

My proposed solution is a web application that would allow the user to submit their application for government ID remotely together with photos of required documents in streamlined easy-to-understand fashion. I picked web application as it can be easily linked to from the government website or for example with QR codes in newspaper. Another advantage is that it does not require the user to install a native app, which represents additional barrier especially for an unexperienced user. It is also easy to keep it updated and the website is accessible just by having a browser. It should be optimized to be used on mobile devices as they will be the most commonly used platform, but it also allows for access from desktop.

The main idea behind the app's user interface design is to match between the system and the real world as suggested by Nielsen (1995) in order to make it more understandable to the user. I take inspiration in the dialogue approach which resembles the status quo of a government officer asking questions from the form. The questions are adapted directly from the Namibian application for duplicate ID (Embassy of the Republic of Namibia, 2018), which I was able to find online in English.

The design strives to be minimalistic by only providing the information that is necessary at the moment (Nielsen, 1995). At all steps, there is an option to go back to previous question, so that the user can fix any errors if need be, or to leave the process entirely. This satisfies Schniederman's (2010) rule for reversal of actions as well as Nielsen's (1995) heuristics for user control and consistency, as the button is always present in the same position. Additionally, the user is provided with the information about the progress with the number of questions remaining. This provides visibility of system's status (Nielsen, 1995). The whole process is illustrated on the diagram that can be found on the last page.

The interaction begins by selecting whether the user wants to get their first ID, get a replacement or check the status of their application. This has its real-life metaphor with a take-a-number machine equipped with a touchscreen with several options that are common in offices. In case that the applicant has an old ID, the application will prompt the user to take a

photo of it and then uses OCR recognition instead of having the user fill out a form with the same information. This provides a shortcut for more efficient process which is also less prone to errors as suggested by both Nielsen (1995) and Schniederman (2010).

Then I proceed asking the questions from the form one by one. The fields *Date of entry*, *Office number* and *Application number* are omitted when compared to the paper form, as in the new proposed solution they can be automated. I have identified three distinct types of input that is needed from the user:

- **Textual information**, which is required for: *First name(s)*, *Surname* and *Place of birth*
- **Selection from predefined options** in: *Gender*, *Marital status*, *Eye color* and *Country of birth*
- **Information** that has to entered **in specific format** a therefore must be checked: *Identity number*, *Date of birth*, *Height* and *Addresses* (residential & postal)

Figures enclosed at the end of this document show wireframes representing the handling of information for one example per each of the above-mentioned categories.

When possible, the interface provides options to select from so that errors can be prevented, respecting one of Nielsen's (1995) heuristics. For example, page asking for the applicant's marital status (See Fig. 3) contains a drop-down list, which only gives valid options as stated in the original form. Checking address automatically is in line with guideline 5.2/14 (Smith and Mosier, 1986). Asking if the postal address is the same as residential prevents the user from repeated input of the same information – guideline 1.0/1 (Smith and Mosier, 1986).

If the input is expected to be in a specific format a hint that indicates it is provided in the same field in which they type the information in accordance to 1.4/20 by Smith and Mosier (1986). Likewise providing units (cm) when asking for height satisfies guideline 1.4/21. Example can be found on page asking for the applicants *Day of birth* (See Fig. 2). In case that the user fails to get the format right regardless an error message with additional explanation in simple language (Nielsen, 1995) will appear allowing for simple error handling (Schniederman, 2010) thanks to being informative as stated in guideline 4.3/1 (Smith and Mosier, 1986). Until the input is corrected, the user is prevented from going to the next question by disabling the button to continue.

After answering all the questions, the user is asked to take a photo of himself with instructions on its required properties, that are immediately automatically checked. All of the additional required documents also have to be photographed. Once that is done, the user is provided with an overview of the information they entered, which they have to confirm by checking a box stating that they everything is true and correct. If not, they can go back to the question that needs to be corrected by clicking an edit button next to the wrong information on the overview.

Then, after clicking the confirmation button on previous page, the use case concludes with a message about the applications ID number, thanks the user for filling out the form and informs them about the next steps. This provides closure for the user as recommended by Schniederman (2010). The application ID can later be used to check the status of the application with an added security measure of also requiring the identity number associated with that application, which is way of easy log-on as mentioned in guideline 6.1/1 (Smith and Mosier, 1986).

The whole process is illustrated on the diagram that can be found on the last page. Together with the wireframes it allows for easier understanding of my design choices explained in the previous paragraphs.

## **Limitations and future development**

As I explained above, I focused on narrowing down the problem to eliminating one government office visit by digitizing the application and allowing it to be processed remotely. Fingerprints are then added to the record when the applicant picks up their printed ID card, which is also when they are going to have to be checked with the existing records.

This therefore creates a requirement on the MHAI information system, to be able to verify any fingerprints in real-time from any of their local offices. When combined with equipping these offices with ID card printers, which are affordable today, it would mean a decentralization of the system. The proposed solution will not work with MHAI head office acting as the central authority, that checks all of the applications, but it would maintain access to all of the information in digital format.

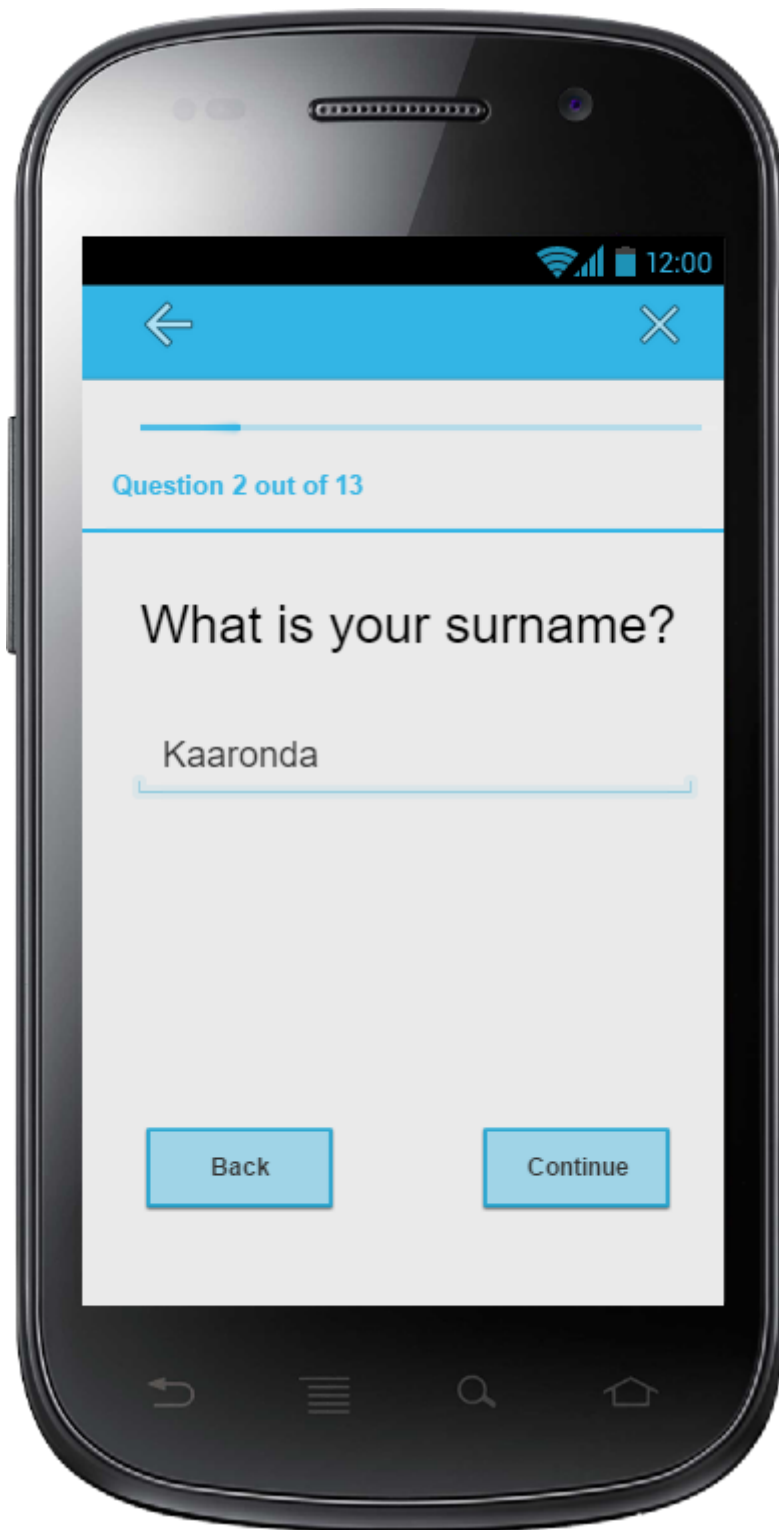
What I would recommend outside of the scope of just applying for a personal ID is to connect and integrate the now separated systems which contains the same of similar data, namely the voter registration database. A presentation by Stefanus van Staden (2017) from the Office of Prime Minister suggest that Namibia is in fact moving in this direction, which also requires updating the outdated legal framework.

A concrete measure that I would recommend is to set up a mobile MHAI office, mostly focusing on young citizens, which they can visit in schools, and under serviced areas. These offices should be equipped to facilitate the whole process at the location. That means having fingerprint scanners, a photo booth and a reliable internet connection in order to access the central databases.

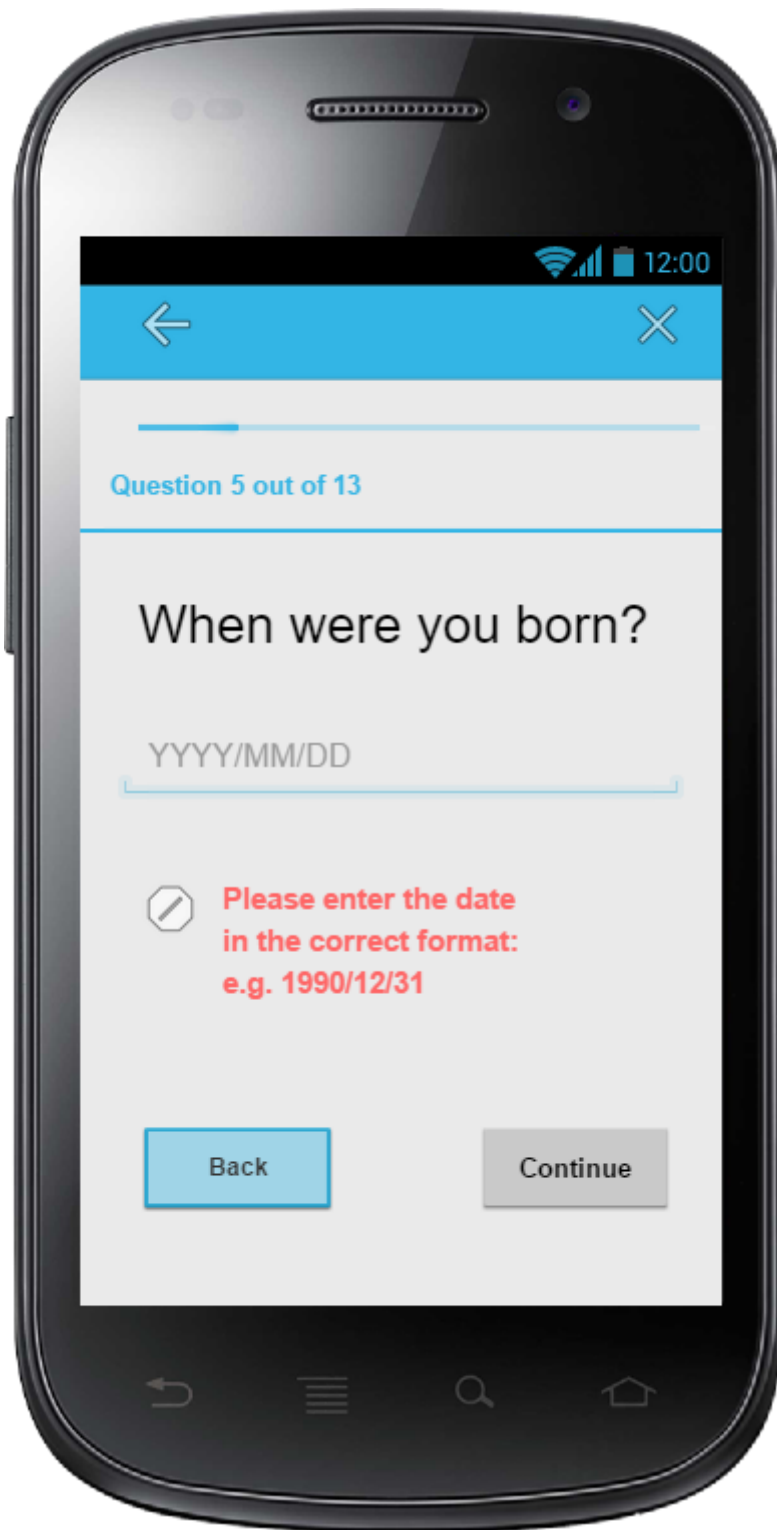
Lastly, I have designed the interface in English, but the users must of course also have the option to apply in Afrikaans or other languages used for public communication in Namibia.

## References

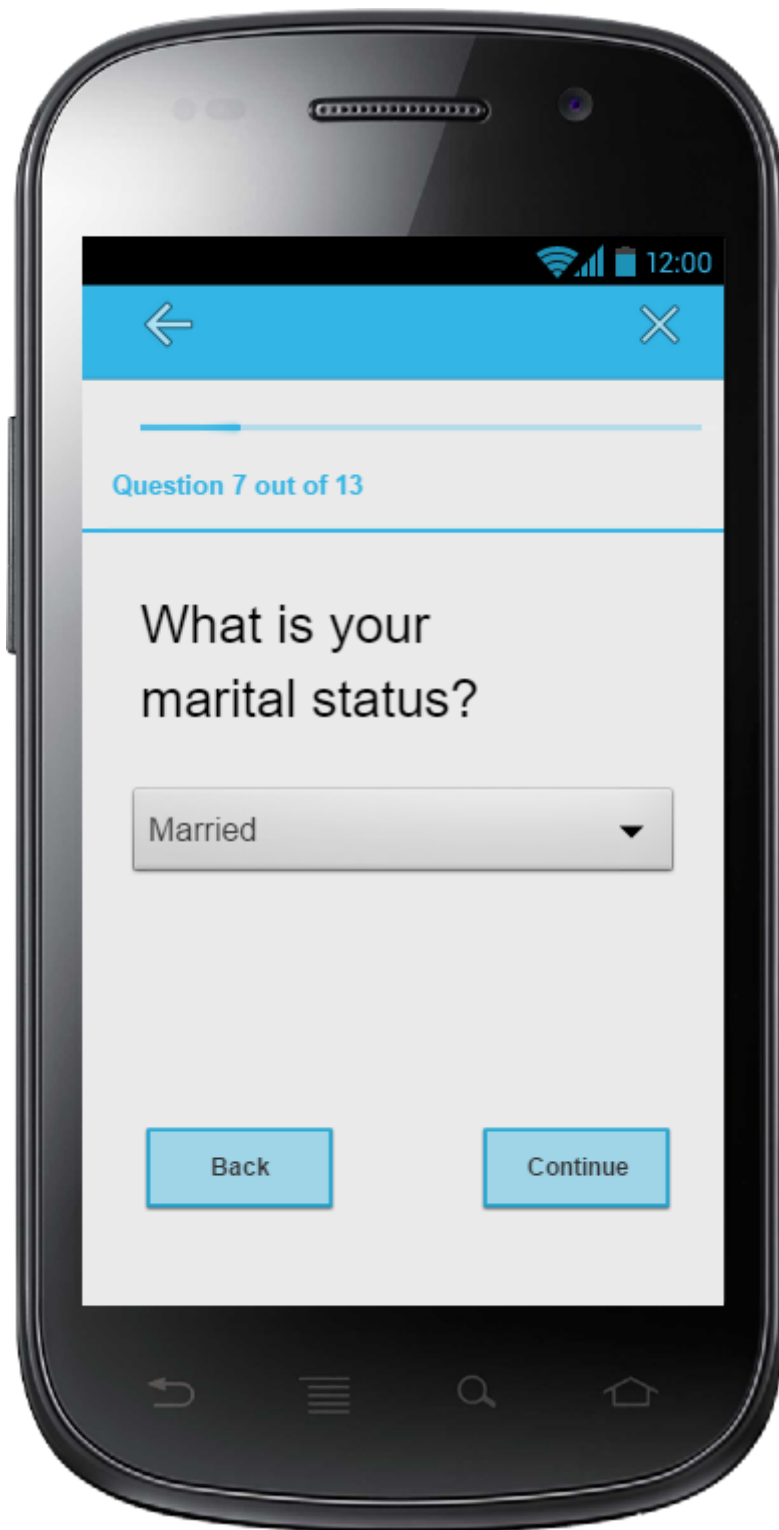
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**Figure 1. Surname**



**Figure 2. Date of birth**



**Figure 3. Marital status**

