

An dialogue interface for announcing births and deaths in Namibia

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Assignment for CS-E5220 - User Interface Construction

Introduction

For this assignment, I chose the announcement of birth or death in remote villages in Namibia. It is an important topic because acquiring a birth certificate gives citizens access to vital services such as an ID card, schooling, government-sponsored healthcare, bank loans, a passport and many other benefits. Unfortunately, in rural villages, not all births are registered, nor are all deaths. There are several reasons for this¹. A first one is practical, a large distance to the nearest registration facility can be deterrent for parents with limited means to travel.

Other reasons are cultural; a naming process in a village of a child can take a long time and parents may not want to register a child before his/hers name is chosen. Furthermore, parents may not be aware of the importance of registering their child. There remains thus a large role for education.

This document handles on the birth registration issue and how it could be solved. It next explains the problem context and describes the agents that would use the solution. From these, a design direction is deduced. In *Methods*, the tools used to come to a design solution are covered. The design solution itself is presented in *Results* where first the general use flow of the application is given, after which the design and interaction elements are explained. Finally, a *Discussion* gives a critical view on the solution and work process.

The problem & scope

In this document I focus on the problem of distance, with the aim of describing a solutions that allows Namibian citizens announcing birth or death in remotely. This document is aimed at the managers of such a project. They could take inspiration from the general solution proposed here and adapt it to their specific use case.

¹ The World Bank, "Namibia Identity Management System Analysis Report" (International Bank for Reconstruction and Development / The World Bank, 2016), <http://pubdocs.worldbank.org/en/184451466711154296/1617304-Namibia-ID4D-Web.pdf>.

Use context assumptions

From the assignment it follows that the user is a Namibian citizen in a rural village. He or she makes use of a communal smartphone and does not have access to a computer. I am adding more assumptions to limit the scope of this assignment.

I assume the user to be a parent. The parent should have access to all necessary documents to complete his or her application. Next, the parent is adequately literate to read instructions on a screen. In terms of technology, he or she should have a rudimentary understanding of interactions with graphical touch-screen UI elements, eg. understanding the concept of a button that will change the state of the application when it is tapped.

Design direction rationale

To get to the right type of interaction I considered the user's characteristics, tools and environment should.

The mere use of a smartphone already imposes some design restrictions and direction. In a smartphone, typing keystrokes is not as convenient as on computer keyboard. Gestures and tapping are the most used interaction mechanisms. Therefore a 'command language' CLI application is not desirable. Next, the screen real estate is typically portrait and small. CLI terminals benefit most from the landscape-shaped windows on computers. In my solution I use a GUI with rich interaction elements to minimize the typing necessary.

Furthermore, the users' characteristics are also considered. Their limited experience with technology demands an easy-to-use application that provides enough guidance. Therefore, I opted for a goal-based dialog structure. On a high level, a question-and-answer structure is used. The answer mechanisms consist of simple data entry fields and menu selectors. There are a limited set of linear interaction paths possible in the application depending on the answers of a multiple choice selector.

Methods

For the implementation of this assignment I used the prototyping tool Invision² in combination with the user-interface design application Sketch³. Specifically I learned to work with the integration of these two tools to create an interactive prototype.

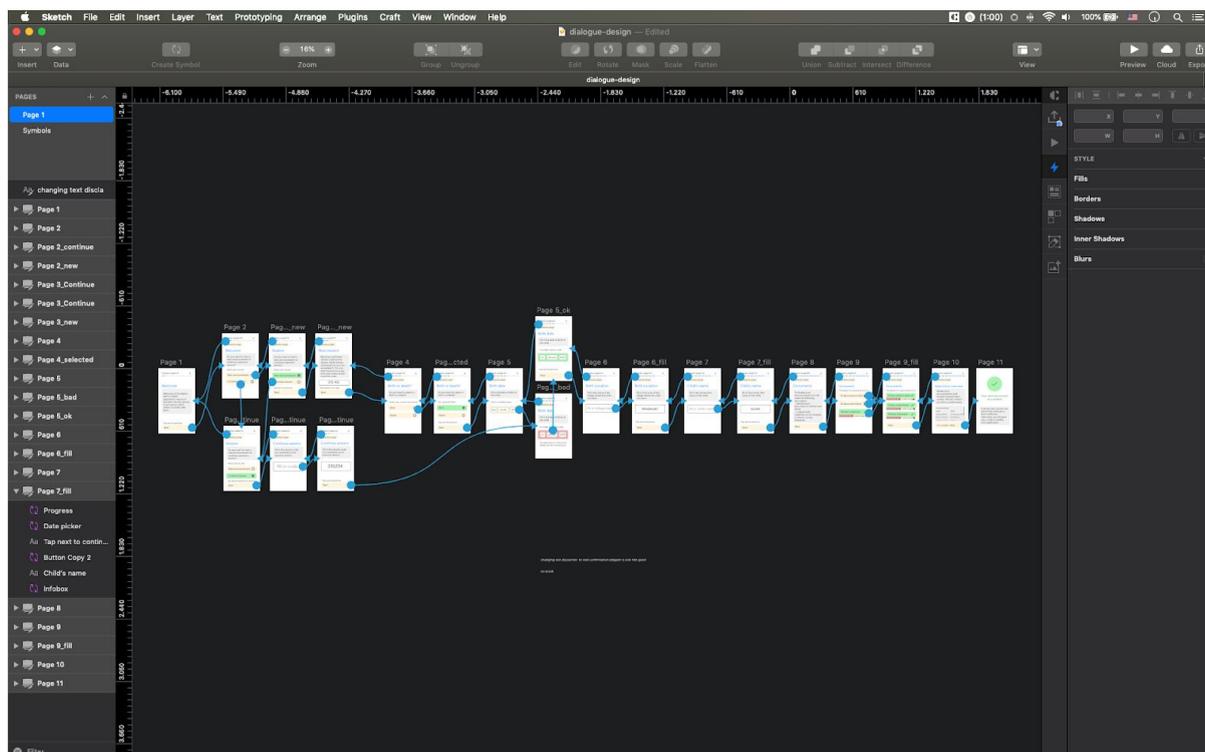


Figure 1: My design flow in Sketch

I collected interface design guidelines that were especially relevant for the use case. The main resource for this was Smith & Mosiers' list of guidelines on data entry and sequence control⁵. In what follows, these are referenced using cursive text like this: *3.0/5 Control by Explicit User Action*.

After an initial design of the application, I evaluated it against these guidelines. I then iterated by making the required changes. For example, after checking the first iteration with the guidelines, I noticed from *3.0/10 Consistent Terminology for Sequence Control* that I had used both words “announcement” and “application” interchangeably. I improved the design by using “announcement” only.

² <https://www.invisionapp.com/>

³ <https://www.sketchapp.com/>

Because the users have little experience with technology and thus form entry on smartphones, I paid special attention to include design principles that ensure clarity of the interface. It should explain itself, and when it does not, explanations should be given. This ensures an easy way to reach the goal.

Results

In this section I discuss the design of the announcement application. I encourage the reader to try out the interactive prototype before continuing by following this link:

<https://projects.invisionapp.com/share/EDP7OJO5UQH#/screens/332388686>

Otherwise, the same example sequence flow can be consulted with screenshots in the *Appendix* at the end of this document.

Birth announcement flow

The design implements a flow of actions needed to conduct an announcement of birth or death. The following process is implemented in the prototype:

1. Choose to start a new announcement or continue a prior one
2. Choose to announce a birth or death
note: in this assignment only birth is addressed
3. Fill in the birth location
4. Fill in the name of the child
5. Upload the necessary documents of proof
6. Review the announcement

The birth registration process is a simplified version of the real potential process, but it aims to be realistic. It could be extended in multiple ways for the announcement of a death using the design elements presented in the following sections.

Stop and restart sessions with session codes

The availability of the smartphone is uncertain in the given use context. Several factors could block a birth registrant to In a rural village: power might be cut of for a while without batteries to charge the phone. The phone network might down, or another community member might have an urgent need for the phone while the announcement is in progress. All these require a registrant to stop his announcement activity,

To overcome these hurdles, a state of the announcement could be persisted in the phone or over the network. It needs to be tied to an identification. I opted for a session code that can be used to recover a session. Compared to an account it is a straightforward solution with minimal information. By writing down a session code, the registrant is also not reliant on the digital technology.

Design elements

The design follows a question-and-answer dialogue design³. This fits the given use case of users that have little experience with technology.

The graphic design was inspired on the accessible and widely used language-learning application Duolingo⁴. In general, buttons and other elements are always big and visible. Auxiliary elements such as labels and modifying buttons are sized to in relation to their importance. Their functions are made to be as self-descriptive as possible, supported with icons.

Page layout

The content is kept succinct and split so that each actionable bit fits one screen, which makes scrolling unnecessary. This design adheres to 3.1.1/2 Questions Displayed Singly⁵ and the common engineering adage of “Keep It Simple”.

Each page has a predictable layout that shows the question and allows the user to enter an answer.

⁴ <https://www.duolingo.com/>

⁵ Sydney L. Smith and Jane N. Mosier, “GUIDELINES FOR DESIGNING USER INTERFACE SOFTWARE : Introduction” (The MITRE Corporation, 1986), <http://hcibib.org/sam/>.

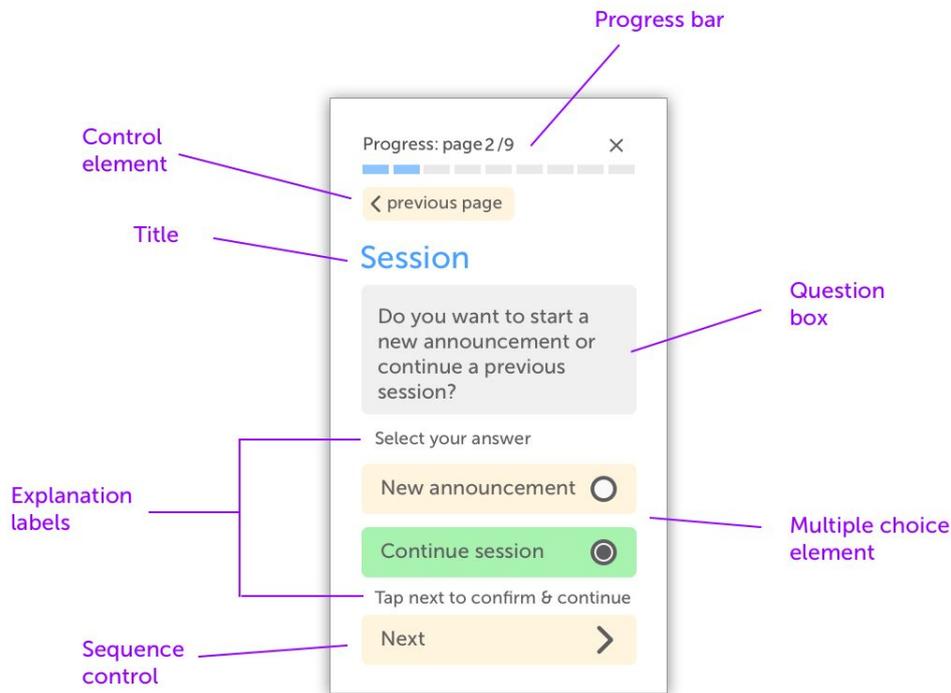


Figure 2: a question-answer page template

At the top is a **progress bar** that shows the advancement in the announcement process. This is a form of constant feedback expected in the ISO 9241-110. It also allows the user to estimate the required time to fill to completion.

Below the progress bar **navigational buttons** are shown. This allows the user to explicitly navigate through the interface (*3.0/4 User Initiative in Sequence Control*, *3.0/5 Control by Explicit User Action*), but also to backtrack and correct possible mistakes.

Below this the **page title** follows with a **question box**. The question box contains a piece of information or question that needs to be answered. **Labels** consistently explain the intention of the interaction elements.

Next, **interactive elements** allow the user to answer. Throughout the application, there are several being:

- A **multiple choice** element that allows for a pre-defined selection of predefined items.

- **Text entry** elements of various sizes to support traditional question-answer type of pages.
- A **date picker**
- A **photo uploader** elements

At the bottom, a **Next** allows the user to go to the next page in the application when data has been filled in.

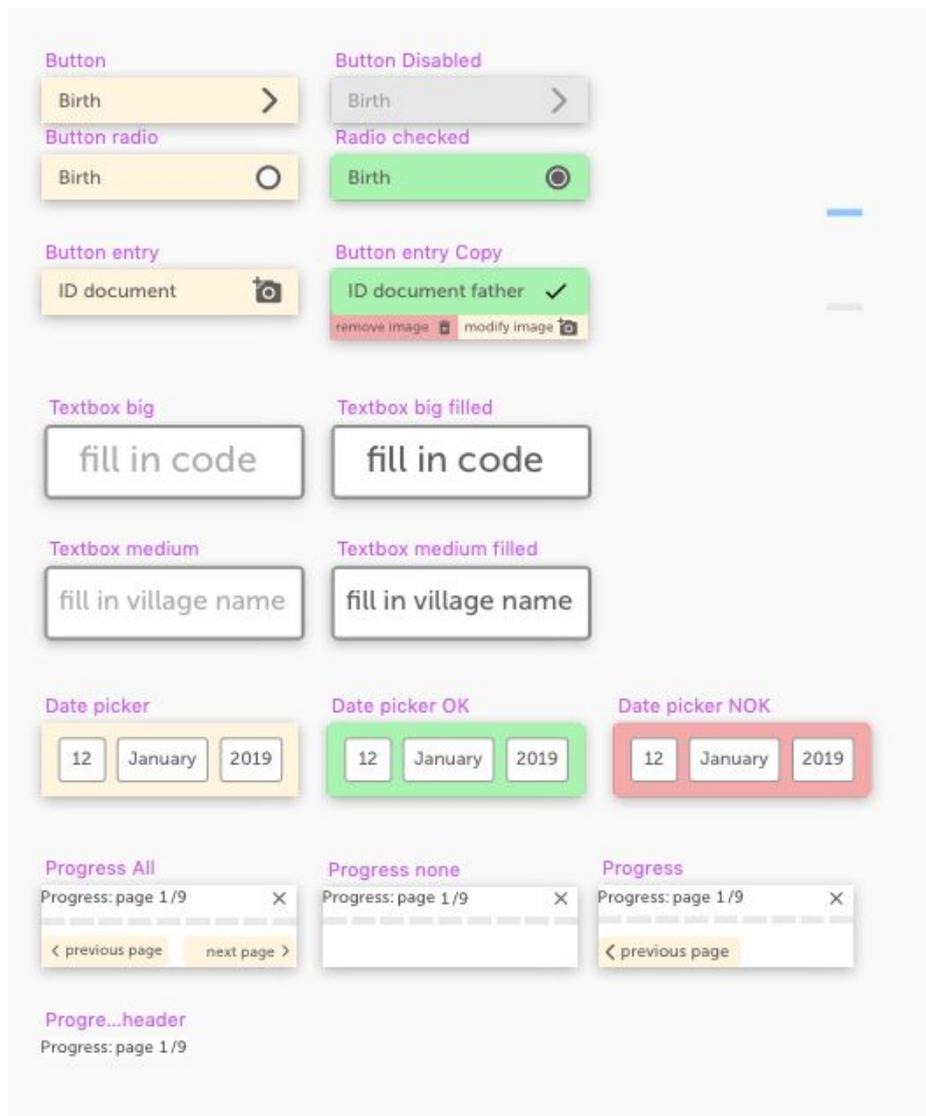


Figure 3: UI elements defined as Sketch Symbols

Interaction aspects

Feedback

In the design of these elements care was taken to provide feedback through element states.

The progress bar gives feedback on progress in the announcement as discussed earlier.

The date picker element for example performs live validation of possible dates (1.7/1 *Automatic Data Validation*).

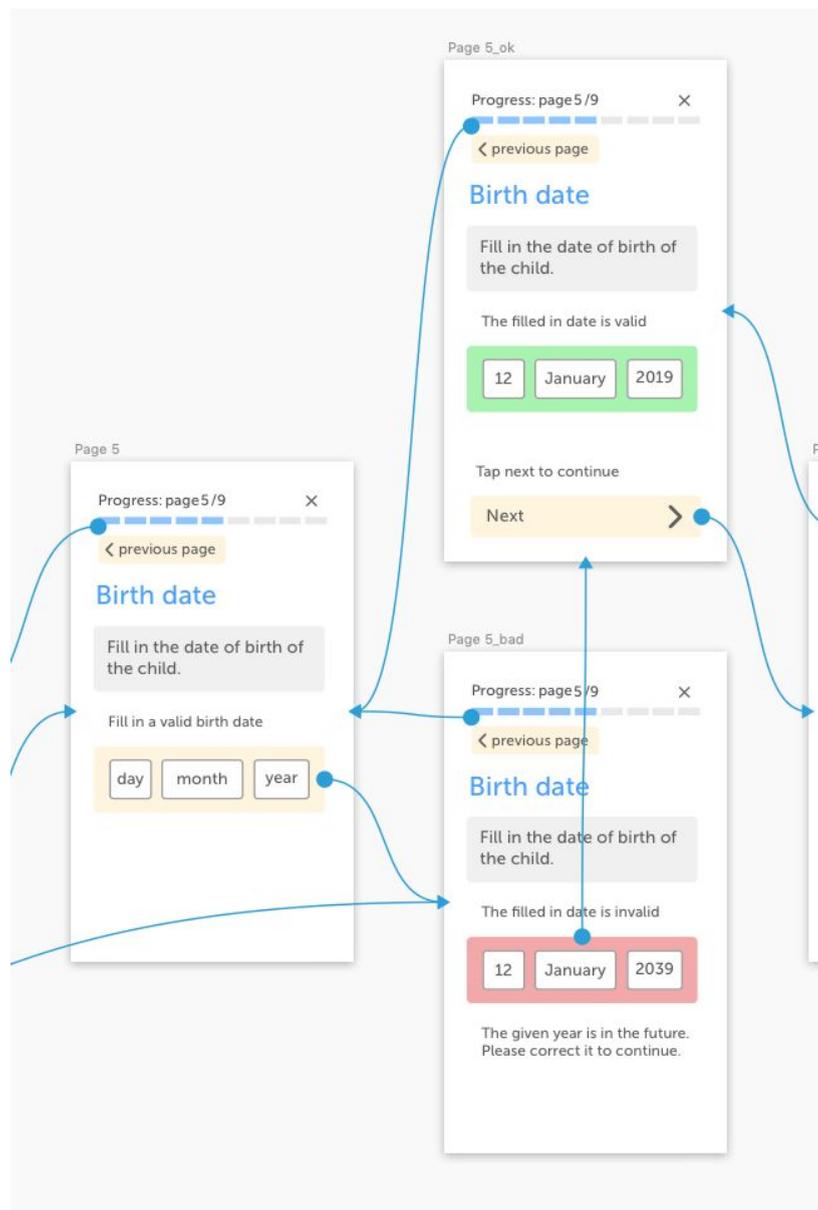


Figure 4: Demonstration of data validation in the date picker element.

When selecting an answer in a menu, *3.1.3/9 Feedback for Menu Selection* is respected by coloring the selected item green. At the same time, the guideline *1.0/9 Explicit ENTER Action* is ignored here: no extra confirmation of entry is required. I think it is a redundant step, given the feedback the user already got.

The same applies to the photo uploader element:



Figure 5: detail of a document upload element

In addition to the feedback of completion, it also has two buttons to remove or modify the image.

Sequence control

Typically, a user reads from the top to the bottom. Thus, the “Next” button is seen after considering the question and data entry fields. However, mistaken selections or mistaken text entry is prevented by combining this layout with *3.1.4/12 + Disabling Unneeded Function Keys*: the next button is disabled until data has been filled in. The next button implements *3.2/12 Consistent CONTINUE Option*.

A closing symbol is given to exit the application at any time.

Discussion

The project aims to solve the problem of lack of birth registrations. It may set a few conceptual steps in that direction, but many issues remain to be resolved.

On a structural level, remote birth registration should be incorporated in local policies and fully remote registration should become possible.

From a design perspective changes are also desirable. Even with the research I performed on the use context I still think that many of my western assumptions slipped in the design. For example, I assume that people read from the left-top to the right-bottom. I assume also that common smartphone application design language is understandable for the user groups. This might very well not be the case, therefore local designers should adapt the design with their specific knowledge about the Namibian citizens.

Continuing on the design approach, it is based on evaluating with guidelines. I don't think this is sufficient, especially since the used guidelines are old (from 1986). Many have become challenged in more than thirty years of UI history and are either obvious as common practices or obsolete because they address functions that are rarely used. I would argue that the users also changed because their collective experience with technology increased. Guideline documents can be tedious to work with and eventually there will be human errors or interpretation errors in using them correctly. Rapidly evaluating the prototype with people could prove a good alternative, especially if they are members of the Namibian target group. This could be done with a think-aloud study for example.

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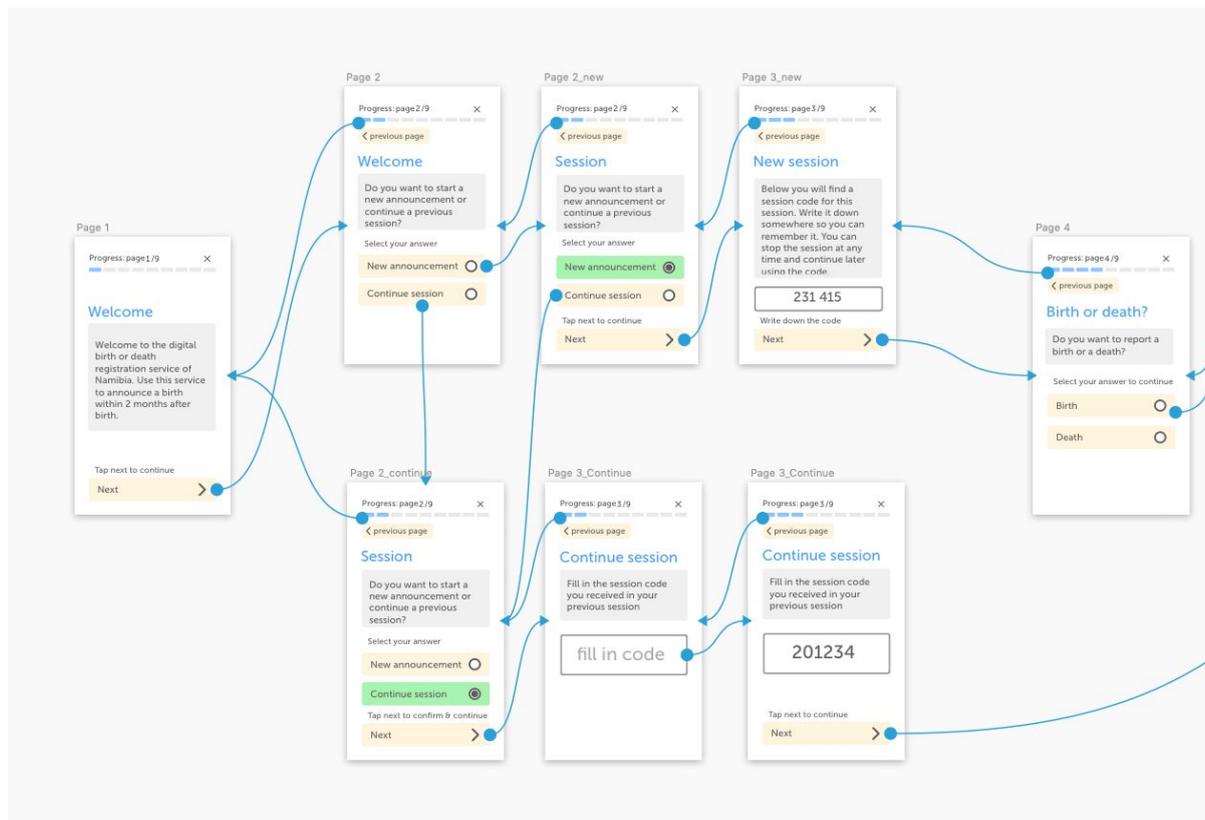
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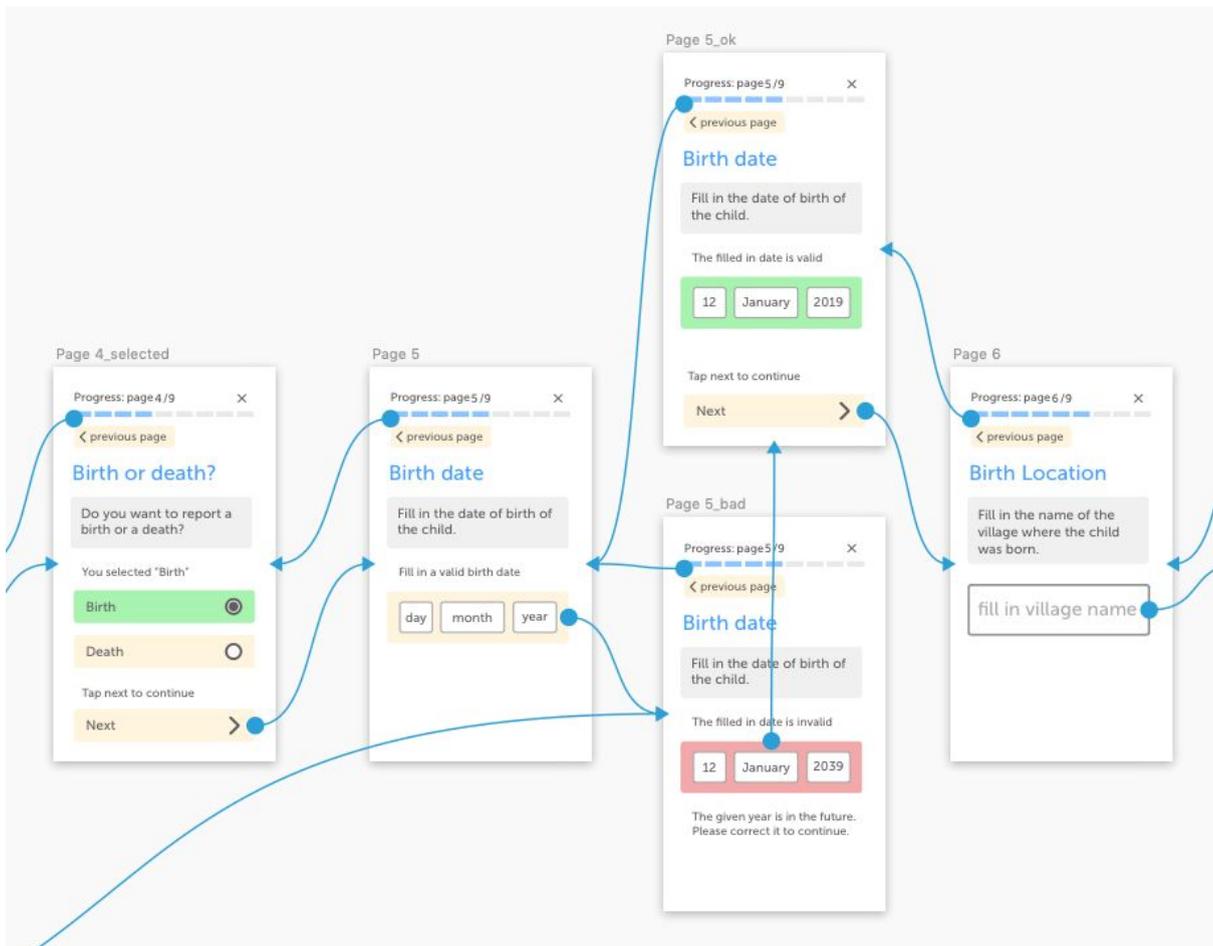
<http://pubdocs.worldbank.org/en/184451466711154296/1617304-Namibia-ID4D-Web.pdf>.

Appendix: a full sequence flow

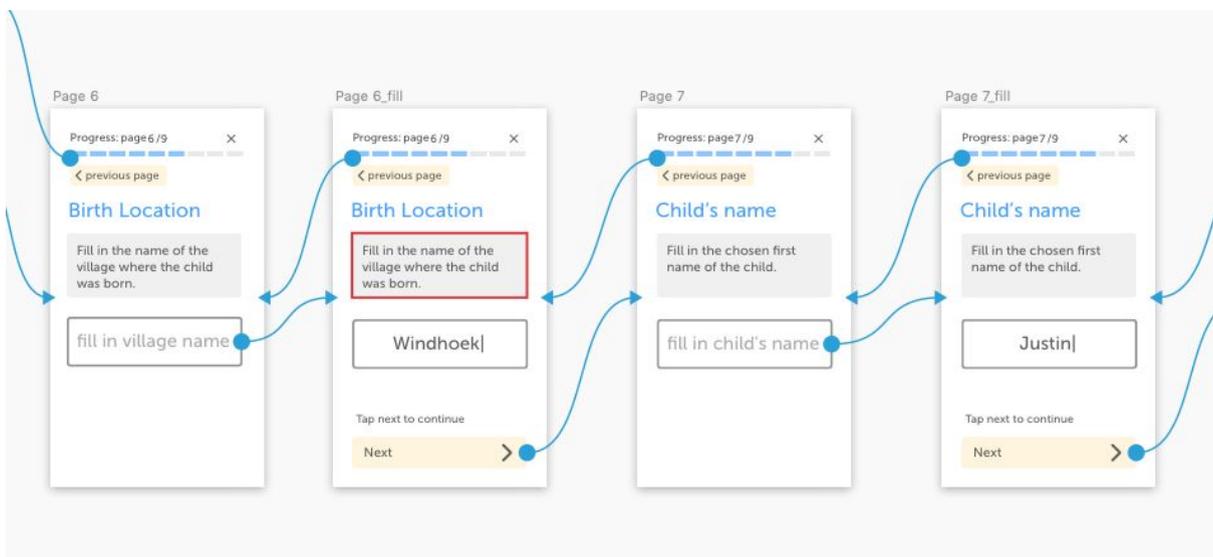
1. Welcoming screens, session creation or continuation, birth or death selection



2. Birth selection + birth date picking



3. Birth location & child name entry



4. Document upload, process overview

