Guiding Refugees Through European Bureaucracy: Designing a Trustworthy Mobile App for Document Management

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Abstract. After being granted asylum in European countries, refugees need to go through a multitude of administrative processes before they can participate in society. However, these processes are often challenging, as refugees struggle to understand them, lack instructions for managing paperwork, and do not possess the required language skills. Prior research emphasizes the role of information and communication technologies to simplify and enable refugee-friendly administrative processes. However, recent research and existing applications mainly focus on information retrieval and do not offer assistance for understanding official letters, completing administrative forms, and managing corresponding documents. Furthermore, refugees are often reluctant to use existing applications as they do not trust their host country's governments and public authorities. In this research, we aim to address this functional and trust gap. We follow a design science research approach to develop a design for a refugee-centric and trustworthy mobile application that assists refugees along administrative processes. In doing so, we identify three design principles that may guide the development of such applications for refugees.

Keywords: Refugees · Trust · Document management

1 Introduction

Global conflicts, human rights violations, and social injustice regularly force enormous numbers of refugees out of their home countries towards Europe [33]. After being granted asylum in their European host countries, refugees typically have a hard time participating in and integrating into society [1,2]. They must go through a series of administrative processes to gain official identity documents, which justify their status and access to public and private services [1] that they would otherwise have difficulties obtaining [18]. However, these processes are often hard to complete for refugees due to language barriers, missing

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instructions, or a lack of understanding of their required contributions [2]. Furthermore, refugees frequently struggle to manage the quantity and diversity of official documents that they receive throughout these processes.

Prior research emphasizes the potential of information and communication technology (ICT) to make such processes more refugee-friendly and lower the barriers to social inclusion [2,18,24]. Research particularly focuses on web and mobile applications that enable refugees to retrieve important information related to administrative processes, healthcare, living, and the local community in simplified language and with an intuitive design [1,29]. While these applications may be helpful for understanding the structure of administrative processes, they currently do not provide support with document management, which ranges from distinguishing and understanding official letters to completing administrative forms and managing corresponding certificates. Consequently, most refugees still depend on the help of refugee assistants to complete administrative processes, which limits refugee's agency, i.e., "people's capacity to act, either individually or collectivel" [13] and perceived self-efficacy [1]. More importantly, refugees often do not trust their host country's public authorities because of negative experiences in their home-, transit- or even host countries [14]. Some refugees are also hesitant to use ICT provided by public authorities, as they fear surveillance and disclosure of personal information that had been used for persecution in their past [8,18,28]. As such, trust is a prerequisite to the refugees' adoption of ICT provided by their host countries.

Adequate ICT solutions need to consider these concerns in their design. They need to give refugees more agency in handling their documents and should foster trust in their host countries' governments [2,8,21]. Acknowledging AbuJarour et al.'s [1] call for research on the design of trustworthy ICT to facilitate administrative processes, this research investigates the following research question: *How to design a user-centric and trustworthy mobile application that assists refugees in administrative processes?*

To answer this research question, we follow a Design Science Research (DSR) approach [26] and develop a design for a mobile application that assists refugees along administrative processes. In doing so, we build upon literature on ICT for refugees as well as institution-based trust. Our design is informed by nine ex-ante interviews with government officials and fourteen ex-post interviews with refugees and refugee assistants, which helped us ensure relevance and rigor. From our final design, we infer three design principles.

2 Background

2.1 The Role of ICT for Refugees

Following their arrival in European host countries, refugees have to complete many administrative procedures to obtain a residence permit, access healthcare, or have educational credentials recognized [1]. As an initial step, refugees typically complete an asylum procedure, which entitles them to access such

basic services. While refugees are often guided throughout the asylum procedure by authorities for migration in Europe, subsequent procedures are not directly tailored to refugees anymore, and thus can be even more challenging [25]. They are often complex and may appear arbitrary for those who are not familiar with the system. Not least as many administrative processes in European countries are still paper-based [1]. In particular, refugees often struggle with understanding paperwork, not only because of language barriers but also due to intricate bureaucratic complexities [2,25]. Refugees are also often missing guidance concerning contributions they have to make themselves and various process steps [2,25].

Integrating ICT into administrative procedures can help refugees navigate integration procedures [1]. Yet, while applications exist that support refugees in accessing important information and identifying themselves, we could not pinpoint solutions that assist refugees along administrative procedures and help them manage official documents. Moreover, we found that many existing applications pay too little attention to accessibility for refugees. This is problematic as refugees may have difficulties using interfaces that do not match their levels of digital literacy or have reading directions that only follow European specifications [29]. As a result, improperly designed ICT may also lead to (digital) exclusion. Thus, further research is required on refugee-centric design [1].

An approach to such refugee-centric design is the integration of increased agency [1,2,29]. For instance, mobile apps for refugees can improve accessibility of vital information concerning areas such as healthcare, public administration, education, or everyday life [29]. Mobile applications can provide digital administrative forms including additional instructions to lower barriers for understanding. Mobile apps can also support refugees with identification and authentication, as currently pursued by the UNHCR [18]. However, when using ICT that process personal data, refugees may also face risks of data abuse, discrimination, and surveillance [8,32]. So-called digital wallet apps, can mitigate privacy-related concerns and even grant independence of public institutions in managing identity-related documents [5]. These apps promise refugees a high degree of self-efficacy, control, and privacy regarding their identity information [5,27].

2.2 Antecedents of Institution-Based Trust

As prior research illustrates, trust and distrust beliefs towards an institution can have a significant impact on the trustee's adoption of digital services and technologies [20]. For our particular research, this effectively means that a successful application for the support of administrative processes and management of official documents has to enhance refugees' institution-based trust and reduce their institution-based distrust.

Trust is commonly associated with "the willingness of a party to be vulnerable to another party's actions based on the expectation that the other party will perform a particular action" [9, p. 3]. Most citizens in Europe trust their governments and public authorities to lawfully and reliably deliver public service.

However, many refugees typically do not have such institution-based trust as they have been persecuted by public authorities in their home countries [9,14].

The formation of such institution-based trust typically depends on three factors: the institution's perceived integrity, the institution's perceived competence for reliable action, and its intention to act in a benevolent manner [21,23]. If a trusting party, such as refugees, believes that an institution will not act with integrity and in a competent and benevolent way, trust will decrease or even be undermined. Such lack of trust may even stimulate the emergence of distrust [21]. Distrust manifests itself when there is a "lack of confidence in the other, a concern that the other may act as to harm one, [...] not [caring] about one's welfare [...]" [10, p. 240]. Like trust, distrust also comprises three dimensions: deceit, incompetence, and malevolence [21,23]. Importantly, a lack of trust does not automatically lead to distrust [23].

3 Research Method

To develop our artifact – a design for a refugee-centric and trustworthy mobile application which we call the "Refugee Wizard" – we adopted a DSR approach [12,26]. In doing so, we followed the proposed DSR process model of Peffers et al. [26]. The process starts with the problem identification. To do so, we conducted nine qualitative and semi-structured ex-ante interviews [30] with government officials that are regularly in touch with refugees. With these interviewees, we discussed problems that refugees typically encounter while dealing with administrative procedures. We identified two main problems: the lack of refugees' agency in managing their official documents and administrative procedures, and weak institutional trust or in some cases even distrust. Thus, our Refugee Wizard intends to support refugees in effectively managing their official documents and mediate trust concerns.

Subsequently, we structured and condensed our insights into *design requirements* – generic requirements that any artifact aiming to solve the underlying problem class should meet – for an application that could assist refugees [7, 22,31]. In addition to the interviews, which ensure the practical relevance of our research, we investigated literature on the role of ICT for refugees and institution-based trust and distrust. This warrants the rigor, validity, and effectiveness of our research [36,37]. Based on the design requirements, we developed and iteratively refined our artifact. We first translated the identified requirements into design features which represent the technical specifications and components of our solution [7,22]. Thereafter, we instantiated the design features into a paper-based prototype of our Refugee Wizard, to help demonstrate our design.

For the demonstration, we presented the paper-based prototype to refugees and refugee assistants and discussed with them the *design features* of our solution. These interviews also served as a basis for the evaluation of our design [34]. Overall, we conducted 14 ex-post interviews with three refugees and eleven refugee assistants – who support refugees along administrative processes on

a regular basis – to gain feedback from an end-user perspective. In particular, we discussed the design features and the Refugee Wizard's usability and trust-enhancing qualities, as well as potentials for improvement. The interviewed refugees were selected from B1 German classes and had successfully completed their asylum application. This enabled relatively fluent conversations on the topic without additional translators. Refugee assistants were selected from local non-governmental and church organizations as they had the most contact with refugees throughout and after the asylum process. They were also often familiar with current technical applications for refugees. After each interview, we evaluated the feedback and adapted our design features and paper-based prototype, if necessary. The interviews enabled us to abstract our design into *design principles* that provide explanations for how our design features address the identified design requirements and provide a solution to our underlying problem class [7]. More specifically, the design principles offer generalizable guidelines on how to design applications that assist refugees along administrative processes and generic capabilities that may technically support trust [3,11,22].

4 Design and Development

4.1 Design Requirements

Our ex-ante interviews as well as the literature outlined in Sect. 2 provided us with six design requirements for our Refugee Wizard. More specifically, they highlighted the potential for increased agency of refugees through the use of ICT [19,24]. Most refugees are currently relying on information provided by government officials or refugee assistants without the ability to "fully participate [...] and control their own destinies" [2, p. 406]. This does not only create exclusion from the society of their host countries but also takes a mental toll on refugees who find it "difficult to accept help – from a cultural perspective – as they do not want to appear weak" (Gov 7). Thus, granting refugees *control of documents and information flows* (DR 1) is a cornerstone of a refugee-centric ICT design in order to prevent the development of distrust beliefs towards host governments and supporting organizations [6]. An *increased availability of relevant documents for refugees* (DR 2) helps them navigate unfamiliar government procedures and information environments [6,16]. To date, refugees often do not know "what they have to fill in, why they have to fill it in, and where to put the filled in document" (Gov 1). *Indications of completeness of documents* (DR 3) and an *overview of documents and information flows* (DR 4) may enable refugees to better understand these requirements, the current state of their respective procedure, and for which documents their identity-related information is needed. *Understanding the required documents and processes* (DR 5) also helps refugees to be "much more accepting of administrative processes – regardless of how positive or negative the outcome" (Gov 5). Thus, knowledge and understanding can ensure refugees' trust in the integrity of government agencies and supporting organizations. An *increased efficiency of data exchange for refugees* (DR 6) may also improve the interaction with and perceived competence of government officials and public

institutions, and thus the trust they place in them. Indeed, should documents be lost or incomplete, refugees may more easily find the "receipt that shows [that] documents have been complete upon submission" (Gov 5).

4.2 Design Features and Instantiation

Guided by our design requirements, we developed design features that were directly relevant for the design of our refugee-centric and trustworthy mobile application [22]. Overall, we identified eleven design features, which either directly concerned document management or increased agency as well as inclusive or culture-specific adaptations of our Refugee Wizard. As a first step towards more knowledge about governmental procedures in their host country, *explanations of unknown procedures* (DF 1) is an important design feature. That is, information in official documents, which is often hidden behind formal bureaucratic language to conform with formal requirements of government documents [4], is didactically reduced to the essential points. To access this information, official documents can be enhanced with QR-codes. Refugees can scan a QR-code provided on a paper-based document with their Refugee Wizard that *automatically allocates* (DF 2) a digital version of the document into *pre-structured document folders* (DF 3) within the relevant application (Fig. 1). These folders concern key areas in the refugees' journey through the administrative processes of their host country, for instance housing, transportation, or health [1,29]. Since refugees "[often] have no idea of folder structures" (RA 5), the pre-structured folders also help refugees to organise their physical documents in folders. In case of successful submission or presentation, another QR-code provided on the receipt issued by responsible government agencies can mark the respective digital document as completed by changing its color to green. This constitutes the *integration of a checklist* (DF 4) to help refugees assess their progress in a procedure and understand the relevant details. Such checklists could also provide information on the due date of document submissions and the intended recipient of a document.

While this design may already allow for more agency, refugee applications also need to *consider different levels of literacy* (DF 5), i.e., not all refugees can read and write [16,27]. To limit discrimination, refugees can choose between written language and sign language combined with audios as basic settings. In both cases, availability of the refugees' native languages is important. This not only includes translations of all information but also *culturally appropriate presentation of information* (DF 6) - such as where information is being provided - to make the user journey more intuitive. Likewise, automation and a simple interface enable the *consideration of different levels of digital literacy* (DF 7), as many refugees are not familiar with using digital devices [16,35].

Inclusive design also extends to the consideration of the refugees' fears and concerns. More specifically, many refugees fear that the use of apps, such as the Refugee Wizard, would allow for tracking of personal information [6]. To address those fears, features of secure digital wallet apps and decentralized digital identities can be included. Comparable to a physical wallet, secure digital wallets can

Fig. 1. Design of the Refugee Wizard.

enable *privacy by design* (DF 8) thanks to methods such as only storing documents and personal information decentrally on refugees' phones, encryption and access management. These features provide refugees with more control and reduce risks of surveillance and the perceived malevolence of governments [5,6]. Due to the intuitive folder structure, refugees could also better *control document sharing and disclosure* (DF 9), while the use of QR-codes on documents could include features for *verifying the integrity of documents* (DF 10). Finally, providing an overview of the documents they need and what they are required for, as well as when they have submitted their documents to the competent person or authority, enables additional *transparency over processing of disclosed documents* (DF 11). Thus, at all points in time, refugees are aware of what happens with their documents and how many documents they still need to complete.

5 Evaluation

In the evaluation interviews, we asked refugee assistants (RA) and refugees (R) to what extent they deemed the presented Refugee Wizard as trust-enhancing and what other functions they believed would further increase the perceived trustworthiness of our application. Both groups highlighted the intuitive organization of the pre-structured document folders (DF 3). They again emphasized that refugees have difficulties identifying relevant documents - some would appear with the entire contents of their mailbox including newsletters and adverts - and are unable to put these documents into a coherent order (RA 4, 10/11). They particularly appreciated the possibility to automatically allocate documents to pre-structured folders (DF 2) with the help of a QR-code (DF 10). Such an allocation would prevent them from saving irrelevant documents or discarding relevant ones (R 1 - 3; RA 1, 2, 4 - 6, 8, 10/11), making them feel less vulnerable and more confident in their interaction with public authorities.

Refugee assistants also emphasized that being able to check the completeness of application documents and keep track of submission deadlines (RA 4, 5) during the application were indeed valuable features. With incoming documents often referring to more or less the same procedure, refugees felt that a transparent overview would increase their understanding and agency. In addition to more integration-related sub-folders, we therefore also included the checklist function for application documents (DF 4). Moreover, both refugees and refugee assistants suggested the addition of a status-tracking function in the Refugee Wizard (RA 4 - 6, 10/11). This would increase transparency for refugees throughout their administrative procedures (DF 11), making it more understandable where they are in the procedure and when they could expect a decision (DF 1) (R 2 - 3). Such transparency would foster clarity and positive beliefs. At the same time, refugees voiced concern that using an app with a status-tracing function would reveal information about them that they do not wish to share. Since many refugees are not aware of their host countries' privacy and data protection regulations or the legal obligations of those countries' governments, privacy assurance would either require extensive explaining or a technology-mediated guarantee (RA 2, 4, 6, 7, 10/11). Overall, many refugee assistants and most refugees would prefer technology-mediated guarantees, in which refugees may trust more than in governments, and they thus appreciated the inclusion of intrinsic privacy and control features (DF 8, DF 9). For explanations of documents and procedures, interviewees collectively appreciated the simplification of content as an addition to official documents (DF 1) as well as the consideration of different levels of (digital) literacy (DF 5, DF 7) to increase understanding and the availability of information. As documents must still be filled in manually, refugees suggested reference examples as part of the explanation for each document in their target languages to make it easier for them to fill in the forms (DF 1, DF 6) (R 1 - 3).

6 Discussion

We consolidated the iterations and evaluations of our design with refugee assistants and refugees in a nascent design theory, i.e. in generalizable design principles [3,11]. We have identified three design principles that provide knowledge on how to design technical applications that help restore institution-based trust [21,23] and mediate institution-based distrust [15,20] of refugees (Fig. 2 and 3). We add to theory by proposing that aside from inclusive or culture-sensitive design, document management and increased agency may be trust-enhancing factors. Furthermore, our design principles may provide potential solutions for practitioners who wish to develop applications for refugees that build on the same underlying class of problems.

DP1 – Guided Document Management: When evaluating the refugee assistants' and refugees' feedback, we found that distrust beliefs in governmental agencies [6] based on incomplete documents or repetitive requests can be mediated by having a mobile document management application. This would not only support refugees in allocating official documents to dedicated folders but would

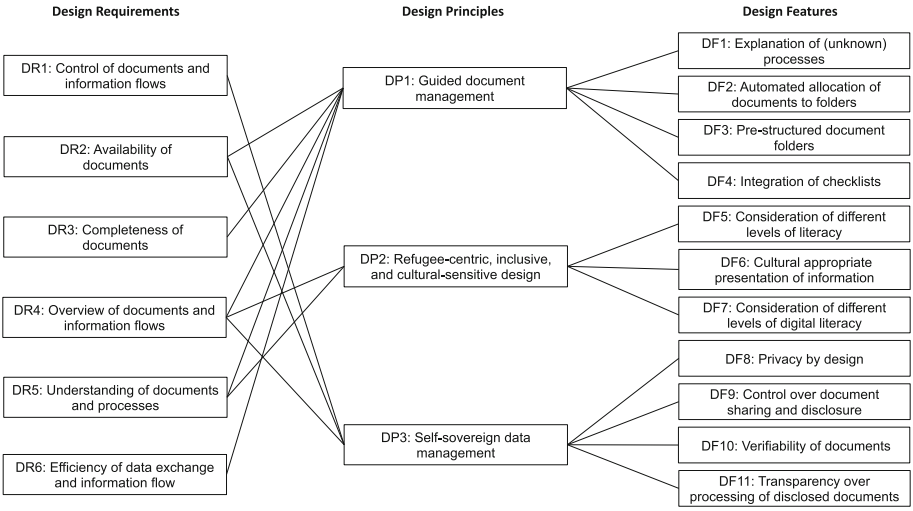

Fig. 2. Overview of design requirements, principles, and features.

also help them understand the purpose and content of such documents, potentially breaking the cycle of distrust. Imparting knowledge of the procedures and requirements in an accessible manner would put refugees in a position of control. With increased control, refugees may not only reduce their distrust beliefs but may be able to better assess bureaucratic requirements and the integrity and competence of governmental procedures, and thereby also build trust [20,21,23]. The additional checklist function of our Refugee Wizard further emphasizes the refugees' position of control. Having something that would not only indicate the completeness of a document but also due dates and receiving parties, creates a feeling of safety. This, in turn, increases the institutions' perceived benevolence and competence and thereby positively affect the formation of trust [21,23].

DP2 – Refugee-Centric, Inclusive and Cultural-Sensitive Design: User-centric design is pivotal in building trust-relations. Newly arriving refugees lack a sense of belonging and agency [17]. In many cases, this sense of alienation and dependency is further emphasized by language barriers and variance in cultural sensitivities. To counteract this trend and bridge the comprehension gap despite the lack of language competencies of many refugees, the Refugee Wizard offers a didactically reduced, personalizable and culturally appropriate design of information presentation [17]. This way, refugees may feel less alienated and more capable to act as they find their needs represented regardless of literacy levels or culture. The same also applies to digital literacy, where automation of key processes, and easy and intuitive icons should prevent less digitally literate refugees from feeling overwhelmed [27]. Overall, positive experiences with the Refugee Wizard and a sense of belonging through culturally appropriate design may foster the belief of benevolence and reduce distrust and fears of malevolence [20,23].

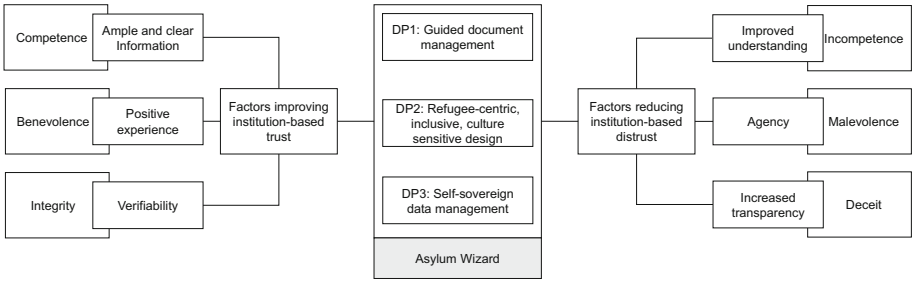

Fig. 3. Design principles for a trust-enhancing design.

DP3 – Self-sovereign Data Management: Gaining more control through understanding and being able to handle one's own data is also closely connected to self-sovereignty principles [8]. By building on best practices from digital wallet apps, the Refugee Wizard could ensure that data stored in the app remains private and in the hands of the refugees [8,27]. Yet, it would also make it possible to share this data with other refugees or trusted refugee assistants in a self-controlled manner to, for instance, provide them with additional samples for filling in documents. Moreover, refugees may share their filled in documents with competent government officials before submission to make sure that the documents are complete. This again may empower refugees and could make them feel more self-sufficient. At the same time, their increased sovereignty may positively reflect on heightened competence beliefs regarding their host country's government and may thus foster institution-based trust [21,23]. Increased transparency through knowledge about processes and having all relevant information available and verified in their app further improves such trust through positive perceptions of the government's integrity and benevolence [20,23].

7 Conclusion

In this study, we discuss how a mobile application that assists refugees in administrative processes can be built in a refugee-centric and trustworthy manner. In a DSR approach based on literature about ICT for refugees and institution-based trust and distrust as well as twenty-three interviews, we infer three design principles from our Refugee Wizard. We find that guided document management and refugee-centric, inclusive, and cultural-sensitive design combined with self-sovereign data management may help to reduce institution-based distrust and enhance trust. Yet, this effect may depend on the availability of privacy-enhancing features which this research only discusses in a limited extent. Future research may extend this work by analyzing in greater details the role of emerging technologies - such as self-sovereign identities and digital wallets - have in enabling trustworthy document management applications. Furthermore, refugees' lack of understanding of the underlying technology to appreciate that governments act in a benevolent manner by providing the app with its proposed

features may be detrimental for trust. Overall, our design may help researchers and practitioners to understand the complex interplay of trust and distrust factors in designing trustworthy and user-centric applications for refugees.

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