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Data Literacy as an Emerging Challenge in the Migration/Refugee Context: A Critical Exploration of Communication Efforts Around "Refugee Apps"

DENNIS NGUYEN
Utrecht University, The Netherlands

SERGÜL NGUYEN
Erasmus University Rotterdam, The Netherlands

Digital media serve manifold purposes connected to communication, transition, resource allocation, and integration in the context of forced migration. Many apps and platforms rely on user data. Organizations do not always clearly communicate what data are collected for which purposes. Policies on data and privacy should convey this information, but they rarely increase clarity and transparency. This can create vulnerabilities for users and raises questions about data literacy: How much do they understand about data practices and how can organizations inform them better? This qualitative study explores 10 digital services (apps-based and web-based) with the walkthrough method in combination with a content analysis of data policies. It charts communication efforts about data practices and consequences for privacy. The findings imply that many organizations fail to address these issues efficiently. They need to critically revise their communication strategies to create transparency and build data literacy among users.

Keywords: data literacy, data practices, communication, apps, refugees

Digital media play a key role in the migration and refugee context as versatile tools for individuals (Gillespie, Osseiran, & Cheesman, 2018) and organizations. The intentions of use vary per context, but data, algorithms, networks, and interfaces always connect migrants and refugees (hereafter: forced migrants) with each other and/or to people and agencies that they interact with throughout the transition from one country to another. This concerns not only data-driven governance, surveillance, and security but also planning and executing journeys, integration, and resource allocation. For example, digital platforms invite residents to advertise vacant rooms to forced migrants (Refugees Welcome, n.d.) or applications facilitate monetary donations (United Nations [UN], 2020). Other solutions help with translation, navigation, education, health, and socializing. Migration processes and governance are heavily digitalized through mobile devices, social media, and apps.

Dennis Nguyen: d.nguyen1@uu.nl
Sergül Nguyen: nguyen@eshcc.eur.nl
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Critically analyzing the digitalization of migration is a distinct research strain (Alencar, Mena Montes, & Vicente Mariño, 2019). In focus are digital technologies' potentials for empowerment and addressing humanitarian issues but also risks for privacy, freedom, and inclusion. The present study outlines how datafication of the migration/refugee context makes critical data literacy an increasingly important issue for all stakeholders. It argues that communication about data practices matters for ensuring transparency and accountability, which may build trust between organizations and their target groups. Clear communication can increase users' understanding of datafication: How, when, and why personal data are collected via a digital service. The empirical part explores how digital solutions communicate with users about datafication processes. This concerns communication efforts of migration-focused organizations, that is, determining the formats and content with which they address target groups. The goal is to assess current approaches and offer recommendations for improvement.

While digital technologies are promoted as solutions to the social and material needs of forced migrants, criticism of data practices grows. Madianou (2019a) points to "techno-colonialism" as an unethical data practice in supposedly humanitarian uses of data-driven technology that creates relationships of dependency and exploitation. Overhyping the positive impacts of digital technology is problematic: Many interventions have limited value for forced migrants, are inefficient, and even bear risks of (unintended) misinformation. The Migration Policy Institute reports that 169 "civic apps" for forced migrants were published between 2015 and 2016, of which most were defunct by 2018 (Benton, 2019). Many remained accessible and included outdated information that could mislead users in harmful ways (Benton, 2019). The risk of shallow "solutionism" (Ferreira & Vardi, 2021) and overconfidence in digital solutions have concrete disadvantages for forced migrants. All data-driven technologies entail risks connected to privacy, untransparent and unilateral handling of sensitive data, and exclusion or discrimination through data bias in automated decision-making systems (Taylor, 2017). In the case of big tech companies, these challenges are the subject of intense critical debate (Couldry & Meijas, 2019) and concern all users of their platforms (e.g., Facebook and Google). However, next to mainstream platforms, there are various digital media that are explicitly aimed at forced migrants and people that either want to help or need to work with them. Such digital services and apps are not excluded from data risks connected to privacy intrusion and exclusion.

These issues raise questions of data literacy, which is part of digital media literacy (Pangrazio & Selwyn, 2019). Data literacy is important for the inclusion and empowerment of individuals in digital society (Sander, 2020); it can build resilience against discriminatory, invasive, and exploitative data practices (Nguyen, 2021). While current debates on data literacy primarily focus on personal privacy and data ownership, the related challenges concern a broader spectrum of ethical questions about data biases, exclusion, discrimination, and (economic) exploitation. Data literacy debates focus on how data are generated, used, exploited, and shared. They aim at creating a critical understanding among users about datafication processes. Building data literacy is an educational mission (Mertala, 2020) and poses a communication challenge for organizations that offer digital services. By embracing transparency and clarity, organizations can create trust-based relationships with users and foster general data literacy by explaining what they do in simple terms, that is, what data are collected, how the data collection takes place, and what impacts data-driven decision-making has on individuals. Terms and conditions (T&Cs) and privacy policies (PPs) are important tools but often fail to inform users comprehensively, let alone instill data literacy through clear explanations of data practices (Shvartzshnaider, Balashankar, Patidar, Wies, & Subramanian, 2020).

Moreover, transparent and educative communication expands to engaging and empathic digital designs that inform users in a proactive, accessible, and open manner (Libaque-Sáenz, Wong, Chang, & Bravo, 2021). This can make a small yet important contribution to ethical and inclusive data cultures.

Research Interest and Research Questions

The present study critically examines communication efforts about data practices in digital media for the migration/refugee context. This concerns when and how organizations communicate with users about data practices and to what extent these practices are explained to them. The exploratory analysis of communication efforts focuses on moments (e.g., frequency), formats (e.g., pop-ups, T&Cs), and content (e.g., quality and quantity of information); it charts affordances and critically reviews data policies. The approach draws from critical data studies, data literacy research, and stakeholder communication/engagement to conduct an "app walkthrough" (Light, Burgess, & Duguay, 2016) and analysis of data policies (Jia & Ruan, 2020). The sample includes different digital media intended for two distinct user groups: (1) forced migrants and (2) supporters in host countries and/or professionals that interact with forced migrants. The research questions are:

RQ1: Through what communication efforts do migration-/refugees-focused organizations that offer digital services and/or apps inform users about data practices?

RQ2: What pointers are available for improving current communication efforts about data practices in the migration/refugee context?

The present study makes two contributions: (1) theory-building, as it is argued that communication through and around digital media is directly linked to data literacy, which is posited as an important component for empowering individuals in migration processes; (2) (tentative) empirical findings that allow for critiquing current communication efforts, indicating points of improvement, and identifying potentials for building data literacy among users.

Digitalization, Datafication, and Forced Migration

Migration and Digital Media

Digital media serve various social, economic, informational, communicational, and/or navigational purposes in the migration/refugee context, with mobile phones, digital platforms, and apps as primary means of access (Alencar, 2020). Following Miller (2020), digital media are defined in this article as means for electronic communication that are networked, interactive, databased, and increasingly automated. They rely on hardware that allow users to access software through interfaces. Digital media are diverse in form and purpose, but most are connected to the Internet, and many serve as digital platforms. One can distinguish here between "infrastructural platforms" (e.g., operating systems) and "sectorial platforms" (Dijck, Poell, & de Waal, 2018), which facilitate communication and information exchange in specific domains of social interaction (e.g., socializing, commerce, and entertainment).

Apps are a specific type of digital media that emerged with the rise of smartphones. They can be closed stand-alone software (e.g., a videogame) or serve as gateways to digital platforms that are accessible from several entry points (e.g., social media). Digital platforms and apps are forms of digital media that can be structurally different, yet closely interwoven—so much so that they are hardly distinguishable. Simply put, not all digital platforms have apps and not all apps are digital platforms but often both are one and the same. Broadly speaking, digital media play an important role in three intersecting dimensions in which migrants are either active users, recipients of goods and services mediated via digital platforms, or subjects gazed at through digital surveillance: Usage of digital media for logistical goals, social goals, and as means of control (Table 1).

Table 1. User Goals and Apps/Tools.

	Logistical Goals				**Social Goals**		**Control**
Purpose	*Informational*	*Navigational*	*Communicational*	*Financial/ transactional*	*Socializing (with other migrants) in the host country*	*Socializing with networks in the country of origin*	*Monitoring/surveillance*
Users, roles	Migrants (active), professionals	Migrants (active), professionals	Migrants (active), professionals	Migrants (active & passive), professionals, donors	Migrants (active), residents	Migrants (active)	Government staff, professionals
Tools	Websites, apps, social media	Apps (e.g., Google Maps)	Translation apps, Google Translate	Social media, e-payment, apps, websites	Social media, dedicated apps, websites/forums	Social media, websites/forums	Social media, apps, websites, browsers, geolocation, etc.

First, migrants use digital media for planning and conducting their journeys as well as managing their arrival and settlement in a host country (Alencar, 2018; Alencar & Tsagkroni, 2019; Leurs, 2017). For example, forced migrants need to find viable travel routes, make payments (Reitano, 2017), manage resources, navigate environments, and so on. Social media and web-mapping services are indispensable for such tasks. Once they arrive, migrants use digital media for managing health (Udwan, Leurs, & Alencar, 2020), finding housing, education, and completing bureaucratic tasks (Alencar & Tsagkroni, 2019). These are the *logistical goals* of digital media use. Migrants are usually the primary users, but in some situations that position shifts to relevant professionals (e.g., medical staff) or residents in host countries that want to donate to and/or support incoming migrants. In the latter case, some digital platforms operate within the logic of the user-to-user sharing economy (Puschmann & Alt, 2016). Sharing platforms are a specific type of digital platform serving as intermediaries for the exchange of goods and services. These platforms are either commercial or noncommercial in outlook; in the context of forced migration/refugees, most offer

services for free. One example is *Refugees Welcome* (https://www.refugees-welcome.net), which invites citizens in host countries to offer spare rooms to forced migrants. A different type of platform facilitates donations (e.g., *GiveZakat*; United Nations High Commissioner for Refugees [UNHCR], 2020). Sharing is less immediate but takes the form of financial transactions coordinated by an intermediary.

Second, digital media are essential for socializing and community formation. It is well-documented how migrant and refugee communities use them to build transnational networks (Madianou, 2019b). These networks offer mutual support in finding solutions to practical issues, including material needs, and have a strong link to identity formation and its preservation (Almenara-Niebla & Asciano-Sanchez, 2020). Maintaining close contact with families, friends, and peers is of utmost importance for forced migrants; digital technologies "foster social capital and genuine community" (Alencar & Tsagkroni, 2019, p. 187). These are the *social goals* of digital media use.

Third, digital technology shapes governmental practices for monitoring and controlling migration. Several countries apply forms of digital surveillance to track migration movements and compile digital profiles of newly arrived migrants (La Fors-Owczynik, 2016). Regimes in countries of origin apply the same strategies to keep "diaspora communities under surveillance" (Opas & McMurray, 2015, p. 1). Forced migrants then become subjects of data monitoring for purposes of governance, security, and control.

Critically analyzing the affordances of digital media and how migrants engage with these reveals the social dynamics behind migration processes. Gillespie and colleagues (2018) argue that "applying the digital infrastructure approach offers a way into a deeper understanding of the dialectical tensions between threat and resource, invisibility and exposure, and mobility and immobility" (p. 10). Users often create and share an abundance of data. On the one hand, data are needed for digital services to work. Without data, most recommendation systems or geolocation services cannot operate. Data allow creators of technology to learn from users and to improve digital designs (Smits, Nguyen, Hekman, & van Turnhout, 2020). On the other, datafication poses risks to privacy and can become a means of control. For example, social media usage informs governments about the whereabouts and background of individual migrants (Latonero & Kift, 2018).

Forced migrants are data subjects that can benefit but also experience different degrees of harm when engaging with digital media; their use is shaped by the dialectical dynamics of opportunity and vulnerability (Gillespie et al., 2018). The moment migrants engage with a digital device; they are assigned (or assume) a data identity largely determined by the design, affordances, and data-collecting mechanisms.

The Data-Driven Feedback Loop

There are two broader types of data-driven digital media relevant for the migration/refugee context: Mainstream platforms/apps and migration-centric ones. Mainstream platforms/apps aim for a general, undefined user profile. The most important ones are social media (Dekker, Engbersen, Klaver, & Vonk, 2018), messaging apps, navigation apps, search engines, and other information services (e.g., Facebook, Viber, WhatsApp, Google). Forced migrants tap into the same affordances that these digital media offer to everybody and develop strategies to meet their specific goals (Udwan et al., 2020). Migration-centric

digital media are tailored to migrants and other relevant stakeholders, often with a specific purpose, such as finding support, sharing resources, or translating. Some apps include diverse functionalities as multipurpose solutions. Most migrants use various digital services and have multiple data profiles existing on different apps and platforms.

Many digital media rely on user data to be functional (Smits et al., 2020). This concerns two intersecting dimensions: First, data are needed to provide users with a digital identity, content, recommendations, results, matches, and so on. For example, to join a social media network, users create an account, accept T&Cs, provide information about themselves, connect with peers, indicate preferences, and use the integrated functionalities for different activities, such as socializing, entertainment, or commercial transactions. Similarly, on sharing platforms, users need to create profiles and set search parameters for personalized recommendations. This describes the level of *immediate user experience* in specific contexts of use.

Second, data are collected through interactions with the interface, such as cursor movements, click rates, navigation, time spent on functionalities, and metadata from other sources, such as devices used (hardware and operating systems), geolocation, and time/duration of access/usage. These technical data also shape user experiences, but their collection is less noticeable; it happens in the background and ideally ensures that systems operate smoothly. This is the level of *technical functionality*. The two dimensions intersect (e.g., geolocation is part of the immediate user experience) and data from both inform digital systems that adapt to user behavior over time in data-driven feedback loops (Figure 1). Uncovering the data-driven feedback loop reveals (1) the purpose of data collection and data analysis and (2) the affordances offered by the digital medium.

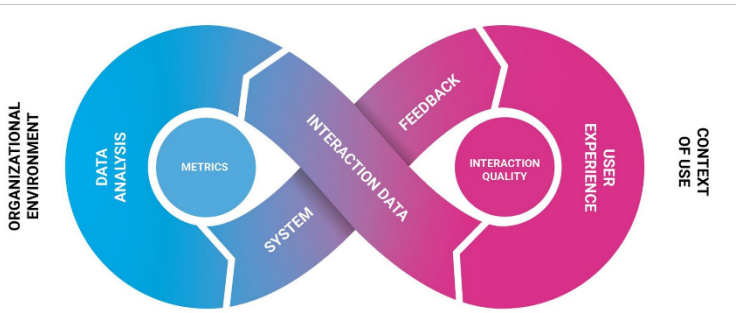

Figure 1. The data-driven feedback loop (Smits et al., 2020).

"Affordances" denotes the horizon of potential interactions with a digital system. Each digital medium creates an environment in which users engage with the medium itself and through it with others and/or organizations; it offers options for "doing something" via interaction qualities. Such interaction qualities are any of the included functions that in sum give the digital medium its purpose. Eventually, interactions are turned into metrics for data analysis. What exactly users do with the affordances depends on individual goals, skills, knowledge, creativity, and their "relational understanding of its environment" (Ettlinger, 2018, p. 3). A digital medium's affordances largely (but not exclusively) determine what the data subject looks like and what it can do.

Digital media connect users through the interface, its interaction qualities, and the underlying data streams to an organization and, where intended, to other stakeholders. Apps implement obvious and hidden intentions of organizations (Bunz & Meikle, 2018). These may be driven by commercial, political, or social considerations. While most digital media are ideally "intuitive," that is, immediately accessible, and comprehensible, most users' understanding is confined to carefully designed interfaces that frame the immediate user experience. They do not necessarily reveal what exactly is happening behind the lid. Moreover, as Mertala (2020) states, "if one wishes to use a certain app or service, one must comply with the data collection policies of the software provider" (p. 36).

Datafication is ubiquitous as "virtually all our technology-mediated actions generate data" (Mertala 2020, p. 32). This can create vulnerabilities, and it raises the issue of data literacy (Pangrazio & Selwyn, 2019), which requires a critical understanding of how interactions with digital media include data collection about an individual's identity, background, and behavior and how organizations make use of that data (Nguyen, 2021). It also connects to communication efforts: How organizations inform users about datafication through digital media.

Data Literacy and the Migration Context

As migration processes and migration governance are deeply mediatized through digital media, they are often heavily datafied. Identities, journeys, and integration are translated into data and shaped by different data-driven technologies. Understanding how these processes work relates to data literacy: Awareness *of* and critical thinking *about* datafication and automation (Nguyen, 2021; Sander, 2020). Discussions on data literacy identify informational imbalances in datafication processes and propose educational interventions that increase users' understanding of how data and algorithms may affect their lives and relationships with others.

A basic understanding of the social, cultural, and/or political impacts ideally stimulates critical opinion formation. This may eventually lead to digital emancipation. Data literacy can build resilience and protection against data malpractices that harvest and extract value from personal data or discriminate against social groups. More specifically, data literacy includes capabilities in spotting and critically assessing data practices, understanding the consequences of data sharing, algorithmic awareness, and knowledge about privacy protection. Data literacy as proposed here is less concerned with numerical/statistical literacy but rather describes critical thinking on a conceptual level about datafication, especially with respect to individual freedom, opportunities, and vulnerabilities in concrete contexts. Data literacy addresses "a need to better support individuals to engage critically with their personal data so they have a sense of understanding, control and agency within the data assemblage" (Pangrazio & Selwyn, 2019, p. 427).

Ettlinger (2018) distinguishes between unaware and aware digital subjects, that is, users who know about data practices and those who do not. To which category someone belongs depends on the extent of their data literacy. Demographic factors are important, as education, income, and the like can correlate with critical thinking about trends in digital transformation (Gran, Booth, & Bucher, 2020). However, personal attitudes play an important role as awareness does not necessarily translate into a critical stance toward data practices (Gran et al., 2020). Data literacy is part of digital media literacy, which further entails practical

Internet skills and basic computer skills (Figure 2). Data sharing may not always be a primary concern for forced migrants, but they can benefit from understanding how organizations work with their data, especially with respect to third parties and governmental institutions that create, store, and update digital profiles (Dekker et al., 2018).

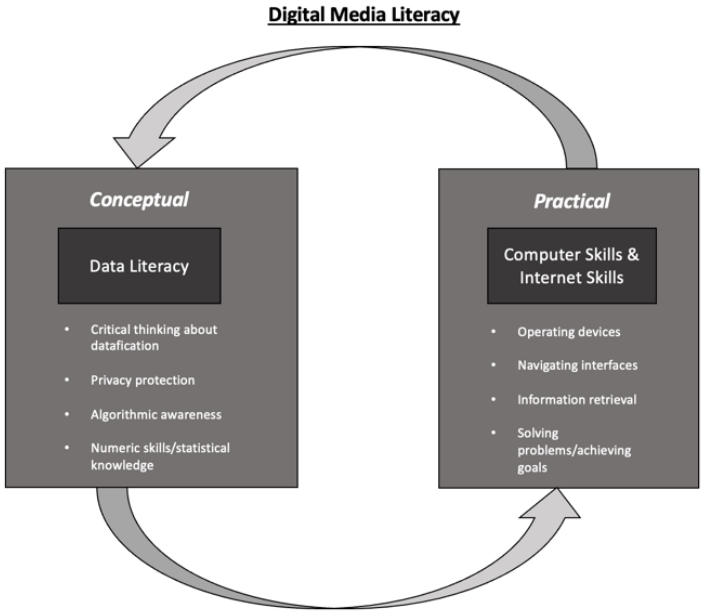

Figure 2. Digital media literacy.

Forced migrants do not necessarily lack data literacy because of a lack of formal education about the issue. On the contrary, critical thinking in the use of digital technology is key to their very survival. Studies show that they compare different sources of online information before forming opinions and making decisions (Dekker et al., 2018; Gillespie et al., 2018). Forced migrants understand what affordances digital solutions offer and how to assess potentials and limitations. Data literacy is a trait that empowers them to make the best use of technology and information (Gillespie et al., 2018). Data literacy for donors/supporters is equally important although for different reasons. It can protect users from potential scams and allow for critical assessment of datafication processes related to humanitarian aid/support.

Data literacy also matters for organizations that offer digital media. They can proactively contribute to building data literacy through clear communication about their data practices, such as data collection, data usage, disclosure, and data transfer and retention (Jia & Ruan, 2020). By clearly outlining how they collect and process user data in accessible formats, they not only ensure openness about data practices but also simultaneously explain them. This can potentially increase users' trust in data practices.

Communicating Data Practices

Transparent communication about data practices should be an important topic for organizations, as several high-profile data scandals have triggered an ongoing, heated debate over intrusive and exploitative data practices and algorithmic discrimination (de Brouwer, 2020; Hu, 2020). Questions of trust, deceit, consent, accountability, and transparency are the focus of these public discourses.

There is increasing pressure on data-driven organizations to explain and justify their operations. For example, the General Data Protection Regulation (GDPR) is an important tool for European regulators to increase transparency in data practices. While the GDPR still contains some vagueness (Awesta, 2020), it has forced organizations to review their data policies, provide access, and improve communication about them so that users can make informed decisions before proceeding with a given service. Violations of the GDPR can result in costly fines (Ruohonen & Hjerppe, 2021). Private and public organizations have a practical interest in clearly communicating data practices, which is a design challenge as more information does not automatically lead to better-informed users. Transparency in communication about data practices directly connects to trustworthiness (Schnackenberg & Tomlinson, 2016). Organizations suffer from loss of reputation, prestige, and trust if they are perceived as unclear, self-contradicting, or deceptive. Avoiding malpractices and ensuring clarity in the communicative approach is vital for sustainable relationships with target groups. Users should have a clear understanding of how a digital medium works and what data are collected when engaging with its affordances. This links communication to data literacy: Explaining how a digital service works with data to what end can increase users' understanding of data practices, their purposes, and impacts.

Addressing data practices concerns both internal and external communication. Internal stakeholders (e.g., employees and service providers) need to understand the scope of their organization's data practices. This concerns the buildup of internal data literacy, as, especially in larger organizations, not all relevant actors are fully informed about/aware of datafication processes that are part of their services and/or products. However, most important are clarity and transparency about data practices in external communication through the digital medium itself and all the information provided next to it (e.g., app store page, website). Any changes to data practices must be communicated swiftly to users, ideally in near real time. The digital medium in its entirety is both a communication tool and a user experience. Information about data practices and user choices should be provided at different moments of user engagement to indicate what data go into the data-driven feedback loop. This starts at the download/registration and spans across the different functionalities that the design offers (Jia & Ruan, 2020). Communication about data practices is not confined to T&Cs and/or PPs but is part of all stages of engagement with digital media.

A holistic communications approach may increase users' understanding of data practices and contribute to empowerment by enabling informed decision-making in the use of digital media. Admittedly, these recommendations are not easily put into practice since they are costly in terms of resources and know-how. Understanding users' data literacy relies on thorough research and testing of different communication formats: What are the different levels of data literacy in the target group and how can an organization best address them? Close collaboration among different experts, such as designers, domain experts, and, most

importantly, representatives of the target group is recommendable but not practicable in all situations. Also, language barriers persist as translations are cost intensive.

Organizations, especially those that work with vulnerable user groups such as forced migrants, want to build relationships of trust with their external stakeholders. Ideally, this takes the shape of a transparent communication strategy combined with opportunities for ongoing dialogue. A one-way and one-time communication approach would not suffice for establishing a long-term partnership with users and a positive perception of their service. Communication practitioners acknowledge the value of long-term opportunities with stakeholders that place emphasis on "collaboration and engagement rather than management and exchange" (Cornelissen, 2017, p. 77). Making data literacy part of communication strategies about data practices provides an opportunity for building such relationships.

Method

The exploratory study combines an "app walkthrough" (Light et al., 2016) with a qualitative content analysis of T&Cs and PPs (Jia & Ruan, 2020). The app walkthrough places emphasis on exploring (1) the affordances that are offered to users and turn interactions into data and (2) communication about data practices. In the walkthrough, researchers assume the positions of users. It is "a way of engaging directly with an app's interface to examine its technological mechanisms and embedded cultural references to understand how it guides users and shapes their experiences" (Light et al., 2016, p. 882). While originating in usability research, the work by Light and associates (2016) repurposes the method for critical analysis within a "cultural study and [science and technology studies] framework" (Dieter et al., 2019, p. 5). The method does not aim at assessing whether a digital interface works "in the way its designers intended but to chart how the creators' intentions become apparent for the user and to critically examine digital media as sociotechnical artefact[s]" (Light et al., 2016, p. 886).

The researcher first outlines the different steps that users need to take before having access to an app and then explores functionalities to provide an overview of the user experience. In this process, the researcher determines focal points that are of interest to the analysis. For example, Jia and Ruan (2020) explored how Chinese social networking apps inform users about data-collection processes by listing moments that prompt data input throughout the engagement. Jia and Ruan (2020) operationalized four dimensions of data and privacy governance for their walkthrough analysis (Table 2): Data collection, data usage, disclosure, as well as data transfer and retention.

Table 2. Dimensions of Data and Privacy Governance (Jia & Ruan, 2020).

Dimension	***Indicators***
Data collection	Types of information collected; opt-out options
Data usage	Terms & conditions
Disclosure	Notifications
Data transfer and retention	Security measures/encryptions

This provides a useful blueprint for charting and critically commenting on communication about data practices. The walkthrough in the present study followed four steps: (1) downloading the app from the Appstore; (2) registering and logging in; (3) exploring affordances by engaging with each app's functionalities; and (4) deleting the account. During these steps, the researchers kept track of any information communicated on data collection, data usage, disclosure, data transfer, and retention (e.g., prompts and notifications). The researchers created user profiles and analyzed both the mobile (iOS) and desktop versions (where available).

The researchers then read through the T&Cs and PPs for the content analysis. The four dimensions (Table 2) guided the critical reading of the texts and subsequent inductive coding, that is, what dimensions they cover, the extent of information provided, clarity of explanations, and how the data-driven feedback loop works.

Sample

The sampled digital media offer practical solutions to different stakeholders in the migration/refugee context (Table 3). The researchers selected them purposefully to include various humanitarian organizations/app providers, user types (forced migrants, supporters/donors), and purposes. All were tested in the latest versions available in December 2020. The sample covers internationally oriented and local/regional services and apps; the distinction is meaningful for the exact content and/or tasks that each digital medium centers on but is considered less relevant for charting communication efforts around similar data practices that generally concern the same main purposes in migration processes and governance. Since it is not unlikely that target groups use a mix of international and local digital services, both types are included for a broad view of different digital offerings. Furthermore, the sample included app versions over websites where available. Mobile devices are prevalent among forced migrants but also have become a primary means of access for other Internet users as well. Where no app was available, the respective website was included.

Table 3. Sample (With Version Number).

Application/Platform	Main Purpose	Target Users	Versions Available
Refugees Welcome International	Housing	Donors and migrants	Browser-based
Share the Meal (6.18.0)	Food	Donors	iOS/Android
The Migration Translation Application (1.3.4)	Translation/communication	Border Staff/migrants	iOS/Android
Love Europe (10.0.7)	Education/travel/socializing	Migrants	iOS/Android
Refugee Buddy (2.5)	Information about the host country	Migrants	iOS/Android
Refugees@Business (1.0.2)	Information for migrant entrepreneurs about the host country	Migrants	iOS/Android
Refugee Speaker (1.0)	Translation/communication	Migrants/medical staff	iOS/Android
RefAid (4.0.0)	Navigation and information about local services	Migrants	iOS/Android
GiveZakat (1.0.3)	Donations	Donors	iOS/Android
RefugeesDILMAJ (1.0)	Translation/communication	Migrants	iOS/Android

The sample covers three categories of digital services: The first category comprises *Refugees Welcome* (https://www.refugees-welcome.net), *Share the Meal* (UN, 2020), and *GiveZakat* (UNHCR, 2020). These services invite donors to share or donate material resources for housing, food, and other basic supplies. *Refugees Welcome* is an online platform that matches vacant housing options with forced migrants in need of accommodation. It operates in 15 countries. It is not an app but is accessible through country-specific websites. *Share the Meal* and *GiveZakat* are apps provided by the UN World Food Program and the UNHCR. Both facilitate monetary donations.

The second group offers translation services to forced migrants and professionals in public services that work with them: *Migration Translation Application* (*MiTA*; International Organization for Migration [IOM], 2020), *Refugee Speaker* (Universal Projects & Tools, SL [UPT], 2020), and *RefugeesDILMAJ* (Dormishian, 2020). MiTA is an app offered by the IOM and aims to facilitate encounters between forced migrants and border staff. *Refugee Speaker* focuses on interactions with medical staff and was developed

by UPT, an international social enterprise. *RefugeesDILMAJ* is a general-purpose translation tool provided by a private developer (Dormishian, 2020).

The third category supports integration: *Love Europe* (Agape, 2020), *Refugees Buddy* (Hordaland Røde Kors [HRK], 2020), *RefAid* (Trellyz, 2020), and *Refugeess@Business* (Stichting Immigration Guidance Foundation [SIGF], 2020). They differ in complexity, but all aim at providing information about host countries, enabling networking, and facilitating navigation. *Love Europe* has the support of various humanitarian organizations but is primarily offered by Agape Europe, an international Christian initiative. *Refugees Buddy* is an app offered by the Norwegian Red Cross, while *RefAid* connects forced migrants with nongovernmental organizations and charities. Finally, *Refugees@Business* supports forced migrants' entrepreneurial activities in the Netherlands and is provided by the Immigration Guidance Foundation.

Analysis and Findings

App Walkthrough

The walkthrough covers download, registration, exploration of affordances, and account deletion. The general insights are summarized for all apps.

Downloading the App

User engagement starts on the Appstore pages, where developers are asked to provide information about content, technical details, and PPs (Figure 3). As of December 2020, Apple has been inviting developers to indicate data practices with the help of easy-to-browse icons (Figure 4). Of the 10 apps only 2 make use of this: *Share the Meal* (UN, 2020) and *Give Zakat* (UNHCR, 2020). Both are offered by the UN and aim at supporters rather than forced migrants. In most cases, users do not have any information about data practices or PPs before downloading. This is a missed opportunity to create transparency right from the start.

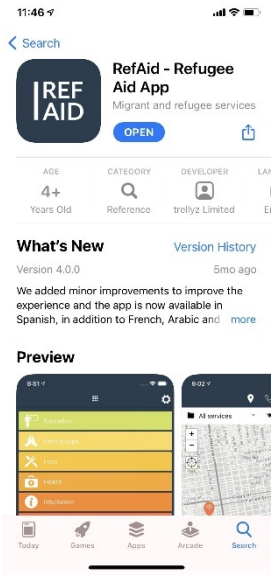

Figure 3. Appstore information (Trellyz, 2020).

In the case of *Refugees Welcome* (https://www.refugees-welcome.net), no download is necessary and users directly proceed with the sign-up and registration. However, information about data practices is not presented before users decide to complete registration, for which they need to confirm acknowledgment of the site's T&Cs.

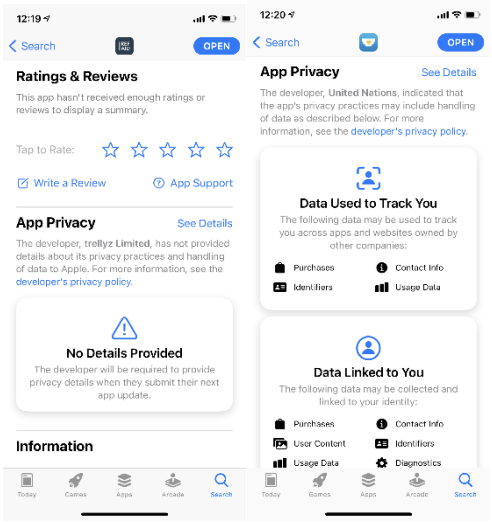

Figure 4. Information about app privacy (UN, 2020).

Registrations and Log In

The extent to which the different services prompt users to enter personal data and inform them about their use differs considerably. Only one app asks users to create a profile/account before it launches (*RefAid* [Trellyz, 2020]) while several others do not clearly communicate at the start that such a profile is needed for them to work (*Share the Meal* [UN, 2020]; *GiveZakat* [UNHCR, 2020]; *Love Europe* [Agape, 2020]). In these apps, the user is asked to provide personal details and create an account at later stages of the engagement, often without a clear explanation of why that input is needed. It appears that app developers assume that users understand from the context why they need to provide personal information, mostly to enable networking and donation services. In the case of *Share the Meal*, users can sign up either via e-mail or an existing account with Facebook, Google, or Apple; it thus connects the app to other data profiles of the user. However, more than half of the apps do not prompt the user to create a specific user profile.

It is common practice to ask users to enable location services and allow notifications (e.g., *RefAid*, *Love Europe*). It is not always clear why these functionalities should be enabled before further engaging with the app. Only *Love Europe* asks users to accept the T&Cs before proceeding to the actual app. Most of the others do not indicate at any point of the registration what their data policies are. In one case (*Share the Meal*), users are informed that by signing up, they automatically agree to the T&Cs and PPs while several others (*Refugee Speaker* [UPT, 2020]; *RefugeesDILMAJ* [Dormishian, 2020]; *Refugee Buddy* [HRK, 2020]; *Refugees@Business* [SIGF, 2020]) lack an "onboarding" process. They simply ask users to indicate a few preferences (mostly language) before moving to the core functionalities. The number of available language options differs greatly but most apps focus on Middle Eastern regions/Arabic-speaking populations. To sum up, there is no uniform format for the registration process, but data practices remain vague across all services and apps (including those that ask users to read their policies); they can only be inferred from the prompts and notifications at this stage.

Exploring Affordances

The apps differ noticeably in complexity, functionalities, user experience, and information provided about data practices. The operationalization of the user as a data subject ranges from "rudimentary" to "complex." For example, *RefugeeDILMAJ* (Dormishian, 2020) allows users to translate between two languages for several preset words and expressions. The operational focus is narrow and the data subject relatively simple as there are no further functions to provide additional information about oneself or to interact with the app. The same applies to apps that are little more than information booklets and link collections (*Refugee Buddy* [HRK, 2020]; *Refugees@Business* [SIFG, 2020]). *Love Europe* (Agape, 2020) stands in contrast to this: It has user profiles, geolocation services, social networking, event calendars, dictionaries (although not for all language options), and informational content. Users engage with a diversity of functionalities that potentially leave a stronger "data footprint." Single-purpose digital media seem less data-driven/data-reliant than multipurpose platforms; at least they include fewer direct prompts for personal information.

None of the sampled apps explain clearly what data are collected while engaging with their functionalities. Prompts and notifications do not explain data practices but only pop up when a data-collection function needs the user's approval (Figure 5). For example, *RefAid* (Trellyz, 2020) requests users to enable geolocation before they can find local information about different categories, such as health, work, shelter, and social life. *Love Europe* also prompts user inputs before functions become accessible, such as gender and location for social networking. However, it is only in this indirect way that apps reveal their data practices after registration (where applicable).

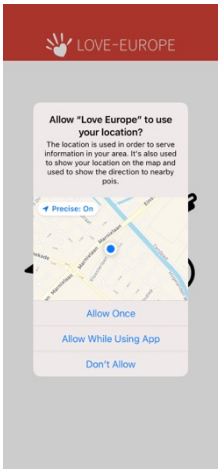

Figure 5. Example of request to access geolocation (Agape, 2020).

Account Deletion

The four apps that require user profiles provide very little information about further data handling at account deletion (Figure 6). If users want to know more, they need to consult the T&Cs and/or PPs.

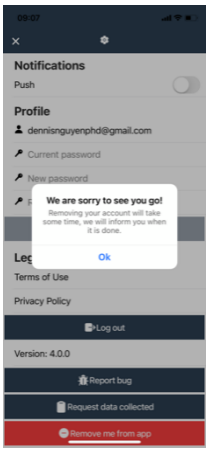

Figure 6. Account deletion on RefAid (Trellyz, 2020).

To sum up, the sampled services and apps form two broader categories that differ in the extent of data collection during the immediate user experience (Figure 7): apps that prompt extensive input of personal data (e.g., name, location, gender, interests, banking details) and those that ask for very limited input (e.g., creation of a username) or do not request any personal information at all. The complexity of an app, that is, its range of functionalities and purposes, seems to determine what and how much interaction data flow into the feedback loop. In neither category are data practices clearly explained and contextualized during user engagement. Options for adjusting privacy options are limited, and interested users need to read the legal documentation if they want to learn more about relevant data practices. Current interface designs and notifications do not provide clear insights.

Figure 7. Personal information requested.

Analysis of T&Cs and Privacy Statements

Since limited information is made available through interface designs and affordances, the primary sites for explaining data practices are disclaimers, T&Cs, and PPs. Three observations stand out. First, *lack of information*: Not all services seem to include documentation about data practices; half of them do not have any identifiable T&Cs and/or PPs (Table 4). Second, potentially *outdated information*: Even if available, disclaimers and policies have not been updated; for example, *RefAid*'s (Trellyz, 2020) policies date back to 2018 while *Love Europe*'s are from 2019 (Agape, 2020). Providers may indicate that they will update policies if necessary but that does not happen on an annual basis. Third, *confusing navigation and imprecision*: Available disclaimers are long texts that are difficult to navigate. They often fail to provide concise examples of how exactly engagement with functionalities translates into data collection. Some disclaimers simply link to external pages where the organization provides general information about data policies without specifying which parts apply to the respective context of use. The exception is *Share the Meal* (UN, 2020) where the PP indicates how specific functionalities relate to concrete data practices. However, the texts remain static, and users need to scroll manually to find the information they are seeking. If they do not know what they are looking for, the relevant information remains hidden. Moreover, very few apps provide legal texts in languages other than English.

Table 4. Data Practices in T&Cs and PPs.

App/Platform	Multilingual	Data Collection	Data Usage	Data Transfer/ Retention
Refugees Welcome International	No	Yes	Yes	Yes
Share the Meal	Yes	Yes	Yes	Yes
The Migration Translation Application	N/A	N/A	N/A	N/A
*Love Europe**	No	Yes	Yes	Yes
Refugees Buddy	N/A	N/A	N/A	N/A
Refugess@Business	N/A	N/A	N/A	N/A
Refugee Speaker	N/A	N/A	N/A	N/A
RefAid	No	Yes	Yes	Yes
*GiveZakat**	No	Yes	Yes	Yes
RefugeesDILMAJ	N/A	N/A	N/A	N/A

*Refers to the organization's general PP.

The critical analysis of T&Cs and PPs shows that there are considerable differences among the sampled digital services. When provided, they tend to address the different dimensions of governance of both data and privacy, but accessibility and clarity vary. *Share the Meal* (UN, 2020), *RefAid* (UNHCR, 2020), and *Love Europe* (Agape, 2020) address the four dimensions of data and privacy governance; they even outline to some degree how interaction data feed into data-driven feedback loops (especially concerning technical functionality). But users need to have some existing data literacy to connect general information to concrete app functionalities: If they do not know what the T&Cs and/or PPs are referring to with respect to service/app usage, they may not understand how they relate to their engagement with the interface. Also, information is often spread across different sites. For example, to get a full view of all relevant data practices, PPs, and the role of third parties, users of *Share the Meal* need to read through three different pages, each with its own format and jargon (*Terms of Use*, *Privacy Policy*, *Third Party Software*). Information about third-party involvement and software packages is minimal and rather technical. To have the full overview, users need to read each of these third parties' own policies, which in some cases is very time-consuming (e.g., *Share the Meal* works with 22 different software providers). Furthermore, there are clear gaps in current communication efforts. For example, none of the apps clearly explain how interactions via networking functions and sharing of content affect privacy externalities (de Brouwer, 2020), that is, the privacy of other users than oneself. Users are basically asked to put limited information into context themselves.

The organizations in this sample treat T&Cs and PPs as checkboxes without considering them essential for communicating about their digital media—if they are included at all. However, even if some apps do not collect sensitive data, clear data—and PPs—can be helpful for understanding how they work. An interesting case is *MiTa* (IOM, 2020): Its disclaimer emphasizes that it should not be used for official translations, but it allows users to communicate important as well as highly sensitive information. While the app does not ask to create specific user profiles, it is unclear if any of the interaction data are collected and stored unbeknown to the user.

To sum up, most organizations do not provide any clear information about data practices and privacy governance that makes transparent how interaction data are collected and processed. There is no standard format for communication, with considerable differences in quantity and quality between each digital medium. Larger organizations that provide apps with options for networking and sharing resources seem to provide the most extensive information, smaller ones may even omit policies entirely. It also seems to matter who the intended target audience is, as services for supporters appear to offer more extensive—but still flawed—information than those aimed at forced migrants directly. While most apps make use of data to run their services and improve performances, few reveal how exactly they implement a version of the data-driven feedback loop (Figure 8).

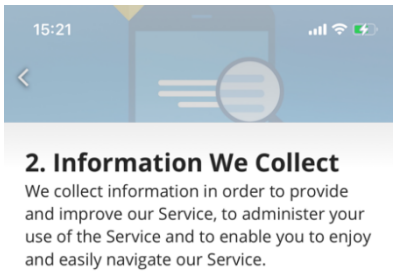

Figure 8. "Information We Collect" on Share the Meal (UN, 2020).

Even if policies are available, users benefit from having some technical understanding and basic data literacy to decipher them. Current practices do not contribute to but rather demand such knowledge.

Discussion and Conclusion

Digital services and apps with a humanitarian purpose provide forced migrants with useful tools that help with practical challenges of transition and integration while offering supporters quick venues for making donations and sharing resources. Most of them are relatively easy to navigate and their core functionalities are obvious to the user.

However, the exploratory analysis implies that clarity and transparency about data practices are not priorities for many organizations. The first research question was: "*Through what communication efforts do migration-/refugees-focused organizations that offer digital services and/or apps inform users about data practices?*" The findings of this analysis reveal diverse approaches to communication. Some organizations make reading policies mandatory before app usage while others do not include any at all. What many have in common is that they do not clearly address what data are being collected at which specific moments during user engagement. If information is available, it is mostly provided at the registration stage and in dedicated sections in the background, with varying levels of detail and accessibility. Notifications mostly pop up to request data access rather than explaining why data are needed. Organizations miss opportunities to increase transparency and clarity and build awareness as well as understanding about the datafication processes. They do not contribute to users' data literacy but rather make it a requirement for comprehension of their data practices. Most organizations seem to treat information about data practices as an obligation rather than an opportunity to build trust-based relationships with their users. This applies to all sampled

digital media, regardless of whether they aim for forced migrants or supporters/donors. However, there are noticeable differences between the communication efforts aimed at these two different target groups. In this sample, apps aimed at supporters seem to offer more information about data practices than those for forced migrants. These are offered by large, globally operating organizations that approach potential supporters, such as customers or clients. Since supporters are usually asked to make monetary donations, it is not unlikely that service and app designs aim to create trustworthiness. The potentials of risk and manifestations of risk differ between supporters and migrants, which may influence how each target group is provided with information by the respective organization. However, more research is needed to establish whether each target group is treated differently with respect to communication efforts about data practices. Overall, digital services in the humanitarian sector display the same communication deficits as those in other domains, but given the vulnerabilities of forced migrants, organizations should explore opportunities to inform users in more proactive, accessible, and educative ways. It should be unambiguous to what extent user interactions and metadata flow into a data-driven feedback loop.

This connects to the second research question: "*What pointers are available for improving current communication efforts about data practices in the migration/refugee context?*" Organizations need to implement principles of privacy by design, revise formats, and identify moments for communicating about data practices throughout the user experience. First, Appstore pages should be complete and make use of any means that help with clarifying data practices and PPs before a user proceeds to download the app. Second, registration and onboarding should summarize the most important information about data collection, usage, retention, and transfer. This may include options to customize data sharing, with an explanation of the consequences of these choices. Users should have the option to request their data for personal review. Third, apps should offer "data tutorials" for first-time users that explain the type of data created by each functionality. Fourth, account deletion and exiting need to include a reminder about data retention and transfer.

Implementing these general pointers depends on material resources and know-how in organizations, but they can increase clarity and transparency and contribute to users' data literacy. This is not an exclusively technical challenge but also a communications issue that needs more attention. In addition to that, organizations should make clearer how digital offerings serve to promote political-social agendas; for example, in the case of *Love Europe* (Agape, 2020) users learn about the explicitly religious motivations behind the app only after consulting the main organization's mission statements on an external website ("What we do," n.d.).

There are several limitations to this study: First, the exploratory analysis covers only a small sample, which does not allow for generalizations. Observations should be confirmed with a more quantitative research design. For example, web scrapers and automated content analyses can expand the study's scope (Dieter et al., 2019). Second, the researchers are neither forced migrants themselves nor do they actively work with them. While the app walkthrough allows the tracing of and critical reflection on user experience, the findings are highly subjective since they are determined by the researchers' sociocultural/socioeconomic situatedness. Additionally, digital media are not self-contained, isolated artifacts but are part of complex and dynamic user ecosystems where other software, hardware, and social factors shape engagement. Future research needs to include users for a better understanding of perceptions of value, expectations toward

communication about data practices, and data literacy. Experiments and cocreation with users are possible tools for combining field research with the development of solutions. The present study is merely a start but makes an argument for the relevance of data literacy for the migration/refugee context and how communication through and about technology relates to it. It may add another layer to critical research on the "digital passage" (Gillespie et al., 2018, p. 2) of migrants and the ethical challenges that come with it.

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