



CHATBOTS IN HUMANITARIAN CONTEXTS

LEARNING FROM
PRACTITIONER EXPERIENCES

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EXECUTIVE SUMMARY

Since the mid-2010s, chatbots have grown in usage and popularity across the humanitarian sector. While this usage has gained traction, there is scarce information on the collective successes, risks, and trade-offs of this automation. This research addresses this gap, documenting chatbot deployments across the humanitarian sector and exploring the existing uses, benefits, trade-offs and challenges of using chatbots in humanitarian contexts. The research was conducted by The Engine Room, with support from the American Red Cross, the IFRC and valuable input from our advisory committee.

This report is not created as a comprehensive overview of chatbots use, instead, the goal of the report is twofold: to offer guiding questions and considerations for humanitarian organisations deciding if a chatbot is an appropriate tool to address programme and community needs. It also contains use cases highlighting the experiences of practitioners working in diverse geographic contexts and issue areas.

Main findings

Always consider community needs, design limitations and responsible data practices

- Before choosing to deploy a chatbot, it's important for humanitarian organisations to properly understand what a chatbot can and cannot do, and to have a clear idea of the resources that will be needed for effective deployment and maintenance over time.
- Chatbots should be designed around the priorities and communication practices of the people humanitarian organisations are trying to reach. Where possible, chatbots should be designed together with communities, local humanitarian actors and technologists.
- The use of chatbots brings up several responsible data concerns, with a need for more comprehensive risk assessments before chatbot deployment, better safeguarding of vulnerable users, the development of best practices around training data collection and holistic data minimisation strategies.
- Automation does not inherently lead to greater efficiency. Any gains presented by chatbots should be considered alongside ethical imperatives that come with a humanitarian mandate and affected populations' specific communication needs.

Chatbots work best when they are integrated into existing community engagement approaches and communication channels, and when adequate resources are planned for

- Rather than replacing human contact, chatbots can be understood as a complementary component of a larger ecosystem of tools, services, and communication channels. They may support the effective provision of basic information, serve as a "triage" mechanism to aid information provision, or steer people to specific services and human assistance. Successes with chatbots have come from the development of "hybrid" communication channels that incorporate chatbot interactions but are also clearly linked to services staffed by people.
- Chatbots have varying degrees of sophistication, and managing user expectations around what the chatbot they are interacting with can (and can't) do is essential for transparency. People interacting with humanitarian organisations should always know when they are talking to a bot, and it should be clear how they can contact a human for further support.
- Though chatbots can enable humanitarian organisations to collect useful information about the needs of people in touch with them, it is important for organisations to understand that digitally collected feedback in general represents only a small sample of the full spectrum of needs of the people that humanitarian organisations might be trying to reach.
- To successfully integrate chatbots within humanitarian operations, chatbots should be seen as a long-term investment: the resources needed to successfully deploy a chatbot will depend on the type of chatbot rolled out and how many people are expected to interact with it. However, any successful chatbot will require at minimum some degree of continued investment and maintenance, alongside dedicated staff time for design, deployment, and ongoing maintenance.

INTRODUCTION

In recent years, chatbots have offered humanitarian operations the possibility to **automate** personalised engagement and support, **inform** tailored programme design and gather and **share** information at a large scale. However, adopting a chatbot is never straightforward, and there are many considerations that should go into doing so **responsibly and effectively**.

With some humanitarian organisations having experimented with chatbots for several years now, many are now interested in taking stock of their experiences and fostering greater awareness of how to **design, budget for and maintain** chatbots responsibly and effectively.

Responding to these priorities, The Engine Room has developed this report to explore the existing uses, benefits, trade-offs and challenges of using chatbots in humanitarian contexts. This research has resulted from a **collaboration** with IFRC, ICRC, and a research advisory board consisting of representatives from IFRC, ICRC, the Netherlands Red Cross and UNHCR.

This report:

- Explores the types of chatbots used by humanitarian and civil society organisations, some of the rationales for their implementation, challenges faced, impacts and practical contexts.
- Offers a set of introductory questions and considerations for humanitarian actors to assess whether chatbots are a fit for their programme needs and the communities they work with. This information is rooted in the principles of responsible use of data and technology and considers both the benefits and the trade-offs of adopting chatbot tools.

Who we spoke to for our research

The findings in this report are informed by interviews with a mix of 11 communications specialists, programme officers focused on humanitarian data, chatbot developers and technologists working with humanitarian organisations. Additionally, the IFRC distributed a short survey (consisting of questions drawn from our interview questionnaires), with answers received back from five respondents fitting the same profiles as our interviewees. In our interviews, we discussed lessons learned from past and current chatbot deployments, including challenges and successes, responsible data considerations around chatbots, operational considerations that go into chatbot use within a humanitarian organisational context and priorities for future chatbot use in the humanitarian sector.





WFP developed a chatbot, Food Bot, to help process information received from Facebook messenger surveys from constituents



CLEAR Global's Uji chatbot uses NLP to answer specific, targeted questions around COVID-19



CLEAR Global's Uji chatbot uses NLP to answer specific, targeted questions around COVID-19

“The landscape is likely to be dominated by simple, functional bots that stick reliably to a predefined script.”

CHATBOT USE IN THE HUMANITARIAN SPHERE

A chatbot can be defined as “a computer program designed to simulate conversation with human users, especially over the Internet”.¹ Chatbots are trained to respond to voice, image-based and/or text input with varying degrees of sophistication.² Simple bots are restrained by pre-determined scripts, such as a list of frequently asked questions (FAQs). These bots can neither hold advanced conversations nor deviate from their scripts. More advanced bots use Natural Language Processing (NLP) and Machine Learning (ML) to mimic human conversation.³

The first chatbot appeared in 1966: a simple pattern-matching bot called ELIZA, designed by Joseph Weizenbaum in partnership with MIT.⁴ Since the 1960s, chatbot technology has advanced to include AI (1995) and has become integrated into messaging platforms (2001). The mid-2010s saw a rise in chatbot popularity, with humanitarian organisations designing and developing chatbots largely in partnership with private companies.⁵ This rise coincides with the prevalence of messaging apps and social media platforms, which are often used to host chatbots (e.g. Facebook Messenger, Telegram, WhatsApp, Kik, WeChat and Viber).

While chatbots have grown more advanced with the addition of machine learning capabilities, the chatbots deployed by humanitarian organisations tend to be relatively simple and generally follow predetermined scripts.⁶ This accords with what The Engine Room, ICRC and Block Party predicted in a 2017 report: “For the foreseeable future, the landscape is likely to be dominated by simple, functional bots that stick reliably to a predefined script.”⁷ But while humanitarian organisations have perhaps been behind the pace of the private sector, our research shows there is currently growing investment and interest in developing more sophisticated, AI-driven bots.

The chatbots looked at for this research can be divided into three types

Given that many different technologies are widely referred to as “chatbots”, for this report we have created a **basic typology** that divides the chatbots we came across in our research into three categories: simple, mid-level and sophisticated.

Simple chatbots

These bots follow set scripts such as FAQs or “If-then” logic.⁸ They collect less data and can be helpful for handling common requests, navigating websites and potentially expediting

services. As they are limited in vocabulary and intelligence, however, they can sometimes result in user frustration (especially if users expect to be able to have a more natural conversation or deal with complex issues). Menu or button-based bots are a popular format for these types of chatbots: in these cases, users click on predefined answers and are unable to send messages through the bot.

EXAMPLE

WFP developed a chatbot, Food Bot, to help process information received from Facebook messenger surveys from constituents. This simple bot is embedded into Facebook Messenger and asks a set of predefined questions. Answers are stored for staff to manually look through and address.⁹

Mid-level chatbots

The majority of chatbots discussed in this report belong to this category. These bots are also known as “keyword-based”, and they are advanced enough to recognise and respond to specific words or expressions, if they are programmed to do so. They often have limited vocabularies, however, which can result in communication issues when responding to slang, dialects, and spelling errors.¹⁰ (For instance, a chatbot might be programmed to respond to “why?”, but not be trained to recognise “how come?”) These bots are able to facilitate greater personalisation than simple bots but cannot mimic human conversation or improve based on past interactions with users.

EXAMPLE

CLEAR Global’s¹¹ Uji chatbot uses NLP to answer specific, targeted questions around COVID-19; it can communicate in French, Congolese Swahili and Lingala. While the chatbot includes AI, it is limited to directing users to the appropriate information and answers they need based on recognised keywords. Staff members have oversight of this information as well and are there to address issues and questions.¹²

Sophisticated, AI-driven chatbots

These chatbots use AI such as NLP to handle more complex interactions. The bots are able to constantly learn from user interactions through algorithms that allow them to improve (and provide better answers) through data collection and processing.

This means that interactions with these types of bots flow more smoothly and tend to sound more natural. However, lack of inclusivity and weak programming in less common dialects, indigenous languages, minority languages and slang are also prevalent even in these more advanced bots, and language asymmetries (e.g., programmers who don’t speak Arabic designing chatbots to be used in areas with specific Arabic dialects)¹³ can result in the reproduction of linguistic injustice and creation of tools that can be ill-fit for the context they’re designed for.

These types of chatbots also tend to collect and store more user data, presenting data protection risks, which we discuss in more detail later in this report.

EXAMPLE

The WFP-led Emergency Telecommunications Cluster (ETC) created their first chatbot instance in 2020 (called Tawasul) in response to high call volume in their call centre in Libya, and to optimise their service offering. ETC Chatbot can use machine learning to communicate in a multilingual framework (e.g. English and Arabic). While ETC Chatbot functionality allows to store and learn from data, in practice it is limited in its ability to mitigate data protection risks. Additionally, a lesson learned from adapting ETC chatbots in various contexts was the difficulty of reusing language models even for the same language when various dialects are in use.¹⁴

Chatbot use cases shared by humanitarian practitioners

In our interviews and survey, humanitarian practitioners discussed several different chatbot deployments and use cases, varying from countering COVID-19 misinformation to providing resources to those displaced due to the conflict in Ukraine. We list some of these below.

- Chatbots used by the Norwegian Refugee Council (NRC), including [one made in partnership with Zing, for information gathering in Ukraine](#).
- An [AI-driven chatbot](#) developed by the NRC in partnership with NetHope, University College Dublin and Microsoft for finding education options for refugee youth.
- Chatbots used by the Emergency Telecommunications Cluster (ETC) in [Libya](#), [Ukraine](#), Ecuador and Iraq.
- A [chatbot used by Chayn](#) to help people navigate their website and connect survivors of domestic violence with resources.
- Information provision chatbots used by Red Cross Chile for cash transfer, information for people on the move and health support.
- Chatbots used by the Armenian Red Cross to collect beneficiary data and applications from potential volunteers on Facebook.
- Chatbots used by the American Red Cross for disaster response, blood donation scheduling and information provision.
- A chatbot developed by the IFRC and the Red Crescent of Kazakhstan [to fight COVID-19 misinformation](#).
- Chatbots used by [CLEAR Global](#) for climate information, COVID-19 response and disaster response.
- A chatbot application tool through Whatsapp piloted by UNHCR for community engagement on messaging apps.



Norwegian Refugee Council in partnership with Zing used a chatbot for gathering information in Ukraine.



NRC developed an AI-driven chatbot in partnership with NetHope to find education options for refugee youth.



The Red Cross Chile used an information provision chatbot to facilitate cash transfer.



The Armenian Red Cross used chatbots to collect beneficiary data from potential volunteers.



Chatbots used by the American Red Cross assist with blood donation scheduling and information provision.

LESSONS LEARNED

This section of the report outlines relevant lessons learned by the humanitarian practitioners we heard from, with critical consideration given to the limits of chatbots, and to when and how chatbots can be appropriate and effective solutions in humanitarian operations.

Before deploying a chatbot in humanitarian operations, it is necessary to assess whether a chatbot is the appropriate tool to address the need at hand

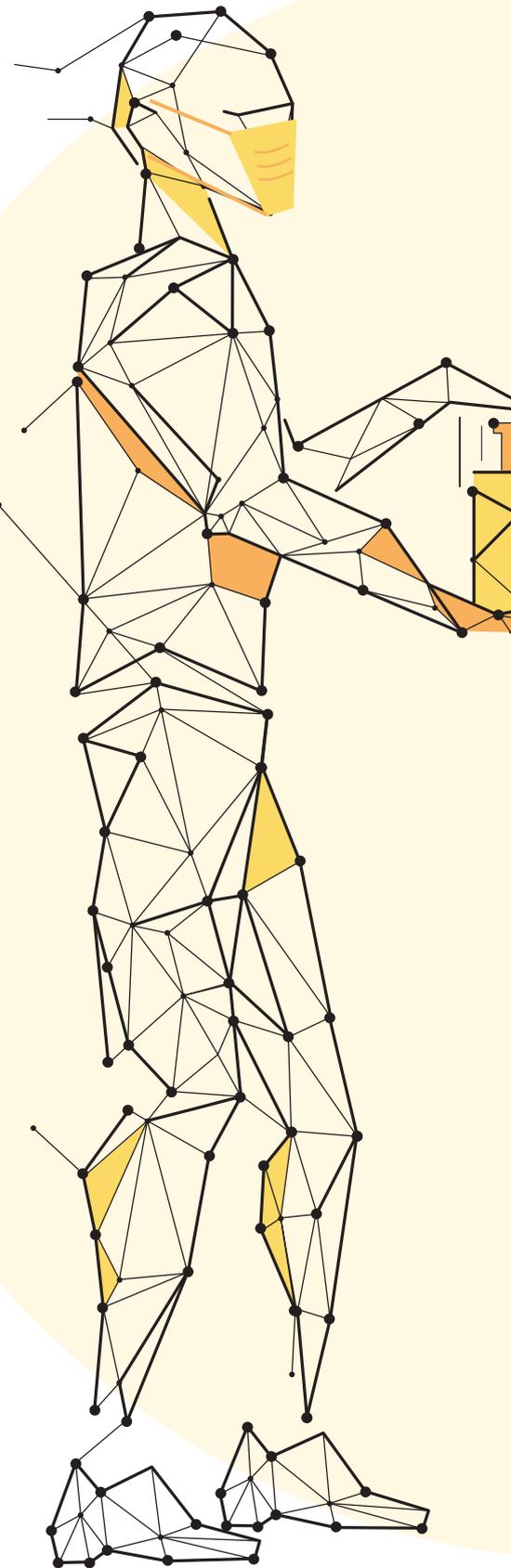
Before deciding whether to implement a chatbot, the interviewees we spoke to urged organisations to be clear on what issue they specifically want the proposed chatbot to address, and to assess whether a chatbot is an **appropriate tool for this**. If the organisation decides that chatbots are the right tool, it's important to ensure there is a **shared understanding** within the organisation on what chatbots can and cannot do.

Humanitarian actors should also weigh the potential benefits of chatbots against the **ethical imperatives** that come with a humanitarian mandate. This includes critical reflection on the degree to which automated interactions can fulfil the needs of the populations a humanitarian organisation is aiming to serve, as well as the responsible data risks opened up by the introduction of technologies such as artificial intelligence and machine learning.

All of the humanitarian staff and chatbot technologists we spoke to said that humanitarian organisations should have a shared understanding of the **resources necessary** for success before going ahead with chatbot deployment, taking account of the fact that a chatbot is not a one-time investment, but rather a tool and infrastructure that will need to be **maintained and changed over time**. Considerations include the resources and capacity required to integrate a chatbot into organisational workflows, language translation and contextual adaptation, infrastructure needs, staff training and internal/external technical capacity needs and maintenance costs.

The question of how chatbots can increase humanitarian responsiveness is still open

Responding individually in a timely manner to urgent requests for information, guidance and services is a common challenge for humanitarian organisations, particularly in the context of acute crises, budget concerns and staff overwork.





For humanitarian organisations, the hope has been that chatbots can contribute to more **responsive and personalised interactions** between the organisation and those they serve. According to several humanitarian staff we interviewed, interest in chatbot use by humanitarian organisations peaked during the early stages of the **COVID-19 pandemic**, when access to field sites was diminished, queries and requests for assistance increased and digital services grew in relative importance.

In this context, chatbots have been seen as a **potential stand-in** for in-person contact, increasing the efficiency of humanitarian response, preventing burnout among humanitarian staff and allowing them to focus on difficult or demanding requests rather than “sitting on the phone answering the same questions 30 times a day.”¹⁵

However, three years into the pandemic (at the time of writing), the humanitarian staff we spoke to emphasise the **need to maintain**, and in certain cases even to increase, **in-person services** and outreach, underlining that chatbots cannot be understood as a replacement for other forms of programming, engagement or communication. Our research suggests that in the best case, chatbots can rather be seen as a **complementary component of a larger ecosystem** of tools, services, and communication channels, supporting the effective provision of basic information and serving as a **“triage” mechanism** to aid information provision and steer people to services and human assistance – the “hows” of which we discuss again later in the report.

There are important limits to the personalisation chatbots can provide

People interacting with humanitarian organisations express a **desire for personalised interaction** that most chatbots deployed by humanitarian organisations do not currently provide. Several practitioners we spoke to told us that people interacting with their chatbots

have demonstrated an expectation of being able to speak to someone capable of addressing complex questions and providing personalised responses, with a demand for high-quality communication, especially in emergency situations.¹⁶

A chatbot's **technical limitations** constrain what kinds of interaction are possible: for example, simple and mid-range chatbots do not recognise typos, slang or phonetic typing. Relatedly, a lot of the time, chatbot app users share statements rather than questions – which many chatbots that are used in the sector weren't necessarily built to decode.

These issues can contribute to frustrating error loops, especially when using bots that don't have “memory” (in other words, when they don't store past information given by users). Setting aside these technical constraints, however, many of those we interviewed emphasised that even the most sophisticated, AI-driven chatbots **should not – and cannot – replace human contact**, especially in high-stakes scenarios such as the provision of mental health care for vulnerable populations.¹⁷

Chatbots bring up tensions between automation and efficiency

“Automation can cause as many problems as it solves,” one humanitarian staff member levelled.¹⁸ One such “problem” is that efforts at greater efficiency through automation can lead to unintended consequences: several humanitarian staff members highlighted that automating exchanges **hasn't necessarily lessened the amount of work** needed to be done by organisational staff, especially those responsible for communicating with and responding to requests that come through the chatbot. Several staff members we spoke to noted that chatbots can instead create new forms of manual work or “double work” for staff,¹⁹ including scanning chatbot interaction transcripts to ensure people's needs were met (and follow up where necessary), collecting additional information left incomplete, and transferring information from chats with users to data collection platforms and back to analyse the data.²⁰

Considered within the broader organisational context, the “double work” created by chatbot use can be understood as an expected part of the **process of integrating new digital tools**; it demonstrates a need to integrate chatbots within existing workflows, practices and policies.²¹ One humanitarian staff member shared that after going through a process of extensively testing and integrating chatbots within their organisation, their staff did observe **some time-saving gains**, with staff reporting that this allowed them to spend less time answering repetitive questions and focus on complex cases instead.

However, some of this work introduced by chatbot adoption is unavoidable: for many we spoke to, it's a priority to **respond to people individually** when a chatbot fails to answer their questions or requests, to continue to meet the organisation's **mandate and minimise reputational risk**. For one interviewee's organisation, concerns over providing adequate responses – on top of the additional work required to obtain complete data – led the organisation to, after initially trying chatbots, subsequently opt for simpler forms of data collection such as forms and surveys.

Chatbots can be valuable feedback mechanisms, but the feedback received isn't representative of community needs

Humanitarian organisations are interested in how chatbots can be used as a **feedback mechanism** to gain insights into population needs and thus allow organisations to **better shape the services** they provide, especially where they do not have a physical presence in a particular country or region. There are two types of feedback that can come into play: the first is feedback about the chatbot itself, and the second concerns the humanitarian organisation's work and services more broadly.

To collect the first type of feedback, organisations use tools such as customer satisfaction surveys, though they note that people often leave these unanswered. To supplement these structured forms

of feedback collection, organisations also analyse “passive” user data such as click-through rates from the chat app to the organisation’s website, to see if users can find the information they are looking for. As noted earlier, the humanitarian organisations that we spoke to also review chatbot interactions manually to find out if people have received adequate responses to their queries.

The second type of feedback concerns the humanitarian organisation’s **work more broadly**. Here, “feedback” might not necessarily be a structured review of the humanitarian organisation and its services, but rather a **request or complaint** regarding specific services by someone using the organisation’s chatbot user or making an initial inquiry. Interviewees said that often this kind of feedback came in not through designated digital channels for complaints or feedback, but rather through whichever channel a person was already using to interact with the chatbot.

The feedback received sometimes demonstrated a **mismatch between the intended purpose of the chatbot and its actual use**. For example, the staff member of one organisation we spoke to set up a chatbot to combat COVID-19-related misinformation but saw that many of the recorded interactions were from people seeking food aid, which the organisation wasn’t placed to provide.

A staff member at another organisation observed that people used the chatbot as a tool for reporting potentially dangerous or risky situations, something the chatbot wasn’t designed for. This staff member highlighted that this kind of **“misdirected” feedback can signal important needs**, and emphasised that organisations need to plan for the eventuality that a **chatbot designed for a specific purpose may be used differently** (a form of feedback in itself).

Our discussions also revealed some broader takeaways on chatbots as a feedback mechanism: the humanitarian staff we spoke to urged organisations to **not over-rely on chatbots or digitally-collected feedback in general**. In some cases, those we spoke to observed that the proportion of people that gave feedback was too small for their feedback to be extrapolated into a wider learning. Others pointed out that the populations most in need often lack access to digital tools, and without their perspectives, it would be difficult to shape services that are able to respond to their needs. Furthermore, the more organisations “listen” to communities through the collection and analysis of digital data, the more likely responsible data concerns are to arise (we look at this in more detail later in this report).

Effective chatbots are integrated with other communication channels

Several humanitarian staff members and chatbot technologists said that their chatbots were most successful as part of a **“hybrid” communication system** that clearly links the chatbot to services staffed by people – described by one humanitarian innovation expert as “adequate oversight or monitoring from a staff member who is able to manage, address or refer select messages that require follow up.”²²

They added that “any efforts to create these solutions need to be accompanied by **organisational and cultural change** that essentially morphs and potentially increases direct community engagement by humanitarian personnel.”²³ Such organisational change might require examining the ways internal knowledge management and information sharing processes behind the information a chatbot provides could fit with (rather than duplicate) the processes behind other communication channels.

As a concrete example of how chatbots can complement other channels for direct communication with communities, a chatbot technologist working with a humanitarian organisation pointed to a case where a humanitarian team ran a radio phone-in alongside a chatbot channel. They saw these two channels as informing one another, which they felt increased the value of the overall engagement. Speaking of lessons learned from this programme, they argued that “chatbots are a **channel of communication alongside others**. It won’t replace them, but it can augment them.”²⁴

Transparency & expectation management are key to trust in chatbot interactions

Expectation management around what chatbots can and cannot do is essential, given that chatbots should be understood as just one part of a broader communications and service provision strategy.

Most of the interviewees we spoke to argued that it's also essential for humanitarian organisations to be **transparent and explicit about when people are interacting with bots**, as not doing so can lead to frustration and confusion. One humanitarian communications expert estimated that only around one third of those interacting with the chatbot on their organisation's social media channels clearly understood that they were speaking with a chatbot, while the majority only came to understand they were speaking to a bot after being asked repetitive questions by the bot (with resulting frustration).

Operational considerations

The successful integration of chatbots into humanitarian operations has human resource implications

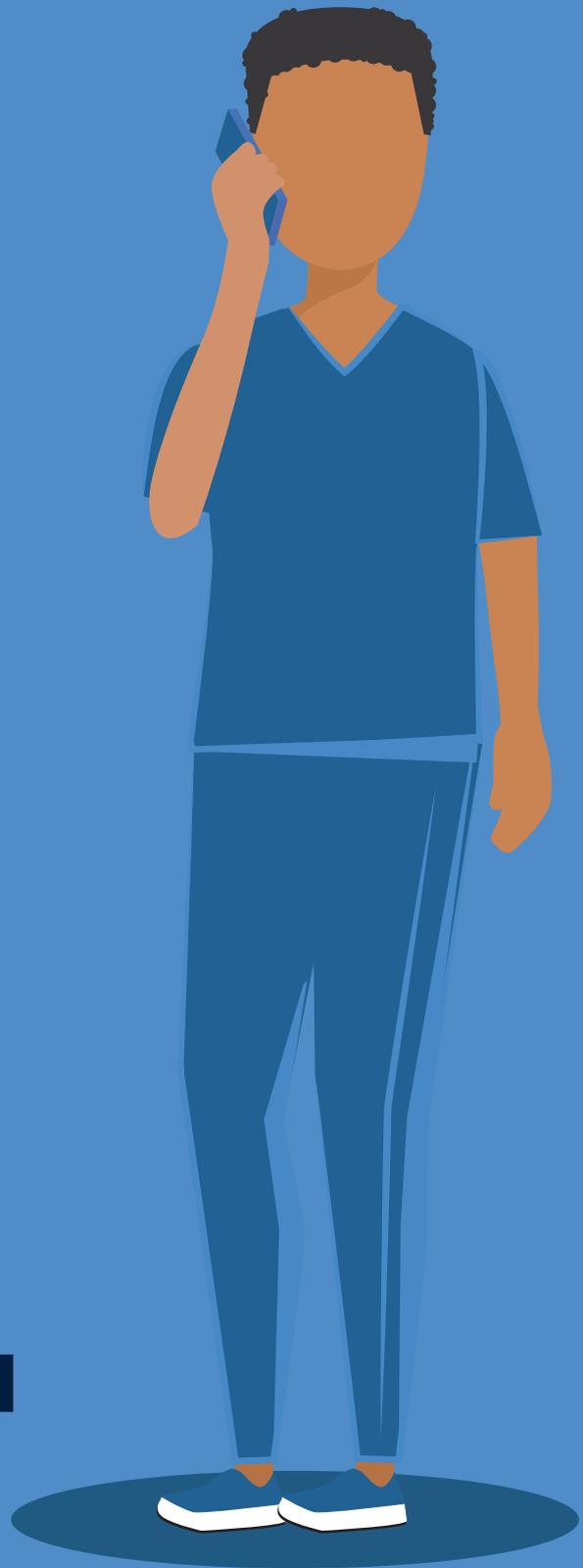
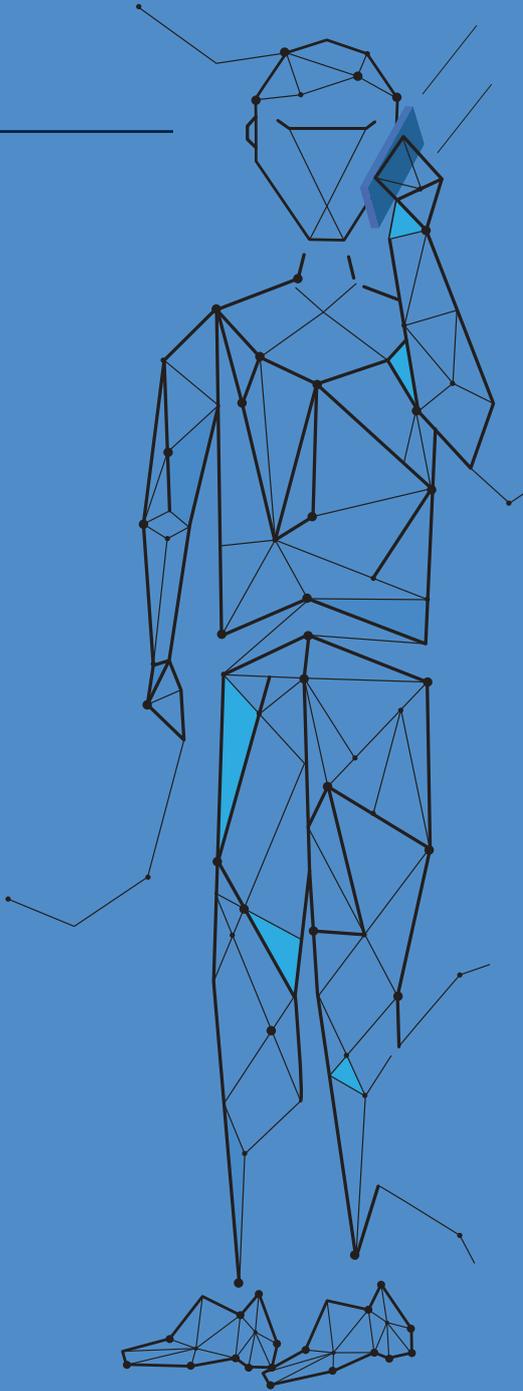
To integrate chatbots within operations successfully, all of the practitioners we spoke to point to the need for **staff training** on how chatbots work and how they **feed into and complement existing communication channels**. Several have found that the participation of organisational programme teams in chatbot design processes is key to developing a chatbot that “makes sense” for local contexts – but this requires reserving enough organisational capacity for this, suggesting a need to budget for **additional staff time and potential new hires**.

While humanitarian organisations often work with outside technologists and firms to design and supervise chatbots, they underline that it's necessary to have a **point person within the organisation** who can serve as the bridge between engineers, the communications team and the programmes team.

Effective budgeting requires understanding chatbots as long-term investments

Budgeting needed for chatbots can **vary greatly depending on the type of chatbot** rolled out and how many people are expected to interact with it. However, interviewees emphasised that chatbots broadly require **continued investment and maintenance**. Those we spoke to mentioned the following key areas in which costs are commonly underestimated:

- Comprehensive, effective cultural contextualisation and language translation.
- The creation of chatbot scripts that are engaging and high-quality in local languages.
- Accessible design, with alternatives to text-based interactions.
- Training organisational staff.
- Technical services provided by chatbot developers.
- Conducting data protection assessments and developing responsible data policies specific to the chatbot.
- Chatbot data processing and server storage, especially where there is a need to increase the scale of chatbot services in response to a growing user base.
- Costs specifically incurred after the startup phase of a chatbot project. Interviewees highlighted the need to consider maintenance at the fundraising stage, as they noted this is more difficult to fundraise for later. Additionally, messaging costs which might be provided pro-bono at the startup phase, especially for emergency response situations, might adjust to commercial rates later on.



**“Chatbots are a channel
of communication
alongside others.
It won’t replace them,
but it can augment them.”**

Responsible data considerations

Chatbots have introduced novel concerns into discussions about responsible data. In the humanitarian sector, responsible data concerns regarding chatbots intersect with ongoing discussions on organisational data policies, GDPR compliance and data sharing practices and agreements between humanitarian organisations, governments, and corporations, among others.

Though chatbot deployment may be guided by broader organisational data policies, our recent research into the use of biometrics in the humanitarian sector (publication forthcoming) has shown that these policies do not always account for the novel data concerns that arise from new technologies (such as biometrics and AI) used in the sector.²⁵

In the last few years, for example, there has been increased attention to the particular issues that the use of AI introduces into humanitarian operations, but **how to operationalise better practices** is a question that is still being worked through. In the context of these broader concerns, the following sections go through the particular responsible data issues – and best practices – highlighted by the practitioners we spoke to.

Responsible data challenges

Uncertainty and lack of awareness around data are common

Several of the humanitarian data and security experts we interviewed worry about a **lack of clarity** in the humanitarian sector around what data is being generated and collected through chatbots, including what is stored on people's devices, chat applications, data collection tools, and in the training data sets powering interactions with sophisticated AI-driven chatbots. Part of the ambiguity results from the fact that the **extent and kinds of data collected depend greatly** on the relative sophistication of the chatbot, its purpose, and the technical infrastructure involved.

Simple one-way information provision chatbots may collect a relatively small amount of data from the user, while a sophisticated AI-driven chatbot may collect and aggregate detailed, granular training data based on extensive interactions with the user. One priority highlighted is therefore to **map and assess data generated and collected** “across the whole chain of tech involved in a chatbot,”²⁶ with the acknowledgement that this is likely to be a resource-intensive task that would need to be repeated at regular intervals to keep it up to date.

Training data increases chatbots' sophistication but also opens up risks

Regarding **training data** required by more sophisticated, conversational AI-driven chatbots, some of the concerns raised include:

- A general **lack of best practices or standard procedures** around how to protect or share training data, with questions around who has access to this data, how it might put populations at risk if misused, and whether training data should be shared with and used by humanitarian organisations. Humanitarian staff members also mentioned that the creation of training data sets often means dealing with companies that see training data as **proprietary information**. They ask if there may be a moral requirement for these companies to share training data, to help humanitarian organisations better understand the needs of vulnerable populations. Conversely, other humanitarian staff members question whether it is ethical to create training data sets from interactions with vulnerable populations in the first place.
- Bias in training data sets, including the underrepresentation of vulnerable populations or overrepresentation of some demographics over others, with consequent overlooking of important priorities and needs.

Notice and consent policies are currently inconsistent and opaque

Currently there are many kinds of **end user licence agreements** (EULAs) that come into play for chatbots and related platforms, including that of chat applications, cloud storage services and the natural language programming processing and training data that goes into sophisticated chatbots.

Several technologists and data/security experts working with humanitarian organisations shared a concern that often, just by initiating an interaction with a chatbot, the user has already provided **implicit consent** to data collection. This is because, after consenting to the terms and services of the chat application where the chatbot is hosted, the user may not receive additional notice of data collection by the chatbot they initiate an interaction with. This has important ramifications, because in addition to concerns about the privacy, security and data practices of common chat applications, chatbots may generate and collect large amounts of additional data on top of whatever the chat application is already collecting. It's often left unclear what is then done with this data by the humanitarian organisation that is running the chatbot and by the commercial third parties involved in managing the chatbot infrastructure.

There's a need, therefore, for **more clarity** for a chatbot's users around **how their data will be processed** at each step, by chat applications, humanitarian actors and other third parties. Easily readable notices (i.e. explaining how data will or will not be retained, and if data will be shared, information about whom it will be shared with and for what purpose) are essential. One survey respondent shared that their organisation has already created a mechanism to provide notice of data collection and to request consent from people engaging with their chatbot.

Evaluating the security/privacy attributes of different chat applications is a challenge

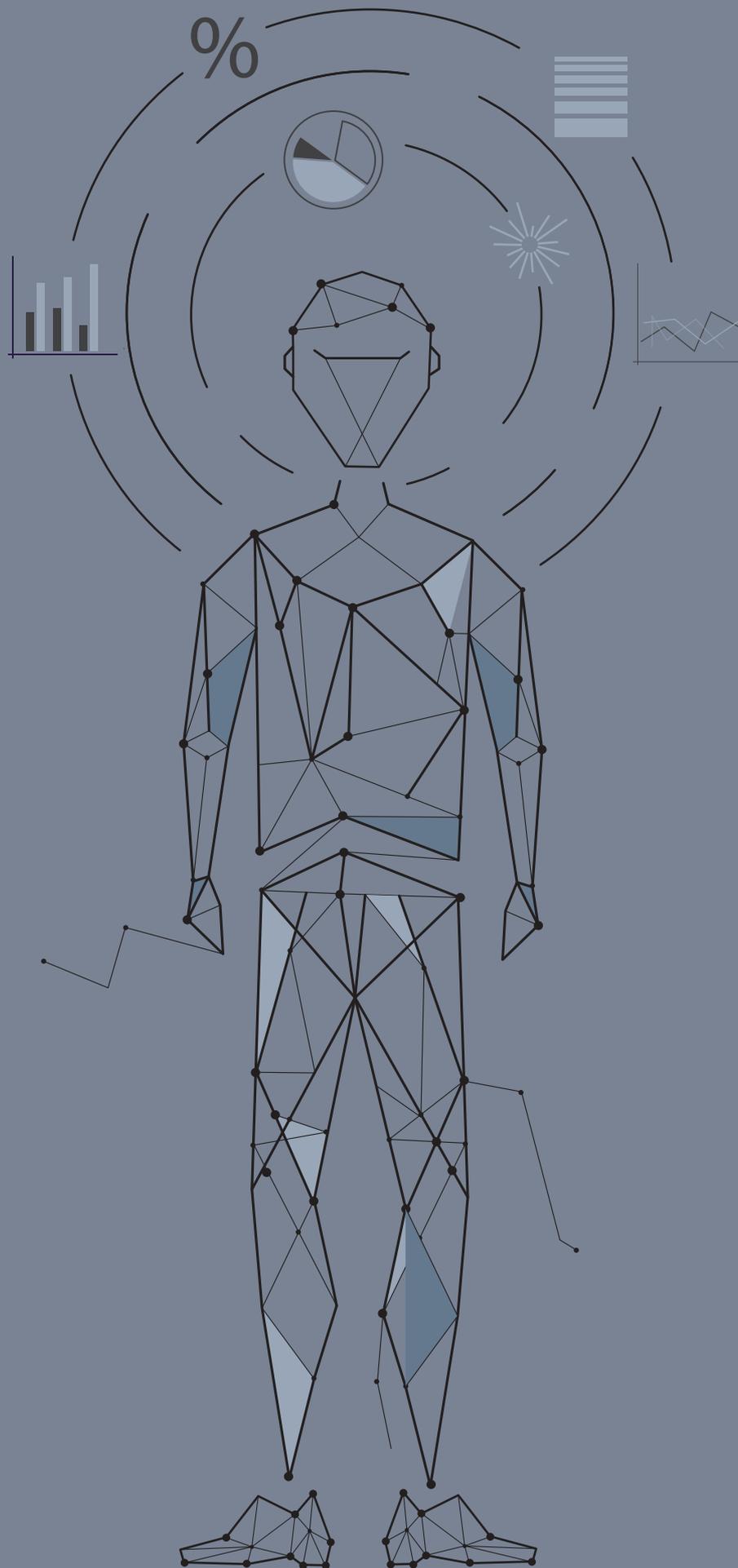
All of the practitioners we spoke to point to the difficulty of **evaluating the extent of privacy and digital security offered** by the communication platforms where they host their chatbots (including WhatsApp, SMS, Viber, Facebook Messenger, Signal, Telegram and others).²⁷ Some organisations we interviewed chose to use WhatsApp because it offers default end-to-end encryption for chats, an important attribute missing from chat applications such as Telegram (where there is an end-to-end encryption option, but the user needs to select it manually). Other practitioners and organisations we spoke to chose a different chat application because they worried about the privacy implications of Meta's ownership of WhatsApp.

Relatedly, data protection attributes can come in conflict with the **communication practices of parts of populations whom** humanitarian organisations work with. Several organisations we spoke to chose to use chat applications they knew had relatively weaker privacy and security attributes because the most important consideration was the use of a **communication channel already popular with their target population**. Hosting the chatbot on a platform that people don't already use would mean less reach and less ease of use for their chatbot, an insight gleaned from the past experiences of several humanitarian organisations.

Chatbots open up complex third-party data concerns

Because the deployment of chatbots is often **managed jointly between humanitarian organisations and external actors** specialising in chatbot development, and these deployments often make use of commercial data infrastructures, there are several questions around how to steward chatbot-related data infrastructures most responsibly.

Some international governmental and non-governmental organisations benefit from the protection provided by diplomatic privileges and immunity (which give them the power to push back against data requests from governments, for example), but these do not apply when these organisations use **external third-party software**. For organisations trying to uphold high standards of data protection, this can limit choices in terms of chatbot software providers.



Some humanitarian staff members we spoke to wonder whether humanitarian organisations should rather build and host their own communications infrastructures; others argue that having humanitarian organisations create and manage their own internal technological platforms also creates risks, as the in-house resources necessary for their technical development and maintenance often don't match what's available.

Making sure chatbot data (both outgoing and incoming) is accurate is a challenge

Humanitarian staff members highlighted the challenge of keeping chatbot communications **up to date and accurate** in emergency situations or quickly shifting contexts. In this context, having an easy way to change and keep information updated, as well as staff with time designated for the task, is a priority.

The problem of **incorrect or incomplete data** provided to chatbots by the individuals interacting with them also came up in interviews – as noted earlier in this report, this is a common occurrence requiring intervention and supplemental work from organisational staff.

We also heard some concern over the **potential misuse** of chatbot communications by malicious actors, though we underline that these concerns are speculative, and interviewees could not point to any documented cases. One adviser to humanitarian organisations particularly expressed concern over potential ID phishing by “bad actors” attempting to obtain sensitive financial information from people on the move. Another interviewee expressed concern over the potential of bad actors to take over a humanitarian chatbot and use it to spread false information in order to incite fear among vulnerable populations.

These two interviewees expressed an interest in **adding additional forms of digital verification of user identities** to chatbot interactions to prevent misuse. Currently, digital verification is already implemented in some cases. In one case discussed, “proof of life” is collected, with users asked to send the chatbot images of themselves holding ID cards or documents, which are then analysed via facial recognition software.²⁸ Several humanitarian staff members and advisors we spoke to emphasise that intensified data collection shouldn't be framed as a desirable eventuality, pointing out that humanitarian organisations have access to a number of other channels in order to speak to and ascertain communities' needs, including in-person, phone, and secure digital channels.

Responsible data best practices shared by humanitarian practitioners

Data protection impact assessments and risk assessments are necessary to ensure holistic consideration of responsible data concerns

Many organisations who are currently deploying chatbots already follow practices intended to assure privacy, security and data protection for chatbot-related interactions and data. For example, several we spoke to are applying GDPR standards (including in non-GDPR complying contexts of use).²⁹ However, there isn't a **shared standard** for responsible chatbot data practices within the sector.

With a general lack of clarity around what data is collected and generated by chatbots, practitioners argue that necessary steps to improve responsible data practices include **systematically mapping chatbot data flows and conducting risk assessments and data protection impact assessments** (DPIAs) prior to chatbot deployment. One practitioner called for the development of a clearer and more formalised risk assessment framework applicable across the sector, along with a set of common protection standards around training data and aggregated data.

Minimising the data that is collected

In cases where a chatbot is intended for interaction with vulnerable populations, some practitioners question whether it is appropriate for chatbots to **collect any data** at all from users – or for

humanitarian organisations to store any data generated from people’s interactions with chatbots. We spoke to staff from two organisations who, after observing that people often provided more data than necessary to their chatbots, explicitly chose to work with simple menu – and button-based (one-way information provision) chatbots to minimise the chance of people inadvertently sharing sensitive data.

Safeguarding features

Practitioners highlighted the importance of **adding safeguarding** features to their chatbots so that people are referred to additional assistance if they trigger any particular keywords that would signal that they are in immediate danger.³⁰

Compartmentalisation and ‘boxing’

When chatbots are used to refer people to further assistance from a humanitarian organisation, practitioners touched on the importance of making sure that **sensitive data is not shared** via the “default” chatbot platform (especially if it lacks encryption); anyone needing to share this kind of data should instead either be moved to secure, encrypted digital platforms or put directly in touch with human assistance.

Design considerations

Centering the needs and priorities of affected populations is essential

Many interviewees emphasised the need to **work with local communities and research the needs of the people they serve** prior to the decision to design and deploy a chatbot. As one interviewee reflected:

“Before you start building something you must engage with the people you are trying to reach, and you have to take the time to understand whether the chatbot is the right way to reach them. It might be that there are other digital approaches, or a non-digital approach is a better strategy. Not every population is well served by a chatbot.”³¹

If deciding to go forward with a chatbot, **participatory, user-centred design** is seen as central. In the cases we examined, however, participatory design that involves extensive collaboration with local communities and target populations is uncommon.

Several organisations we spoke to have primarily tested their chatbots internally with their own staff – or only solicited feedback on the chatbot after its deployment.³²

One chatbot technologist we spoke to, whose company develops chatbots for humanitarian organisations and regularly engages with local partners and organisations to assess needs and co-design the chatbot, is currently seeking to collaborate with and foster increased technical expertise with local technologists in order to increase “local ownership” of chatbot solutions. This would increase both the appropriateness and sustainability of any given chatbot deployment.

Language and cultural contextualisation are key

Across the board, everyone we spoke to highlighted that **language and cultural contextualisation are central** to effective and appropriate chatbot use. The components of adequate contextualisation include translation into local dialects, and chatbot scripts that are culturally appropriate and comprehensible. Achieving these requires intensive coordination and resources within the design process (in the last section of this report, we offer a set of considerations to consider here).

Access & accessibility considerations impact if and when chatbots are appropriate

Both humanitarian staff members and chatbot specialists underline that **inequality and differences in access to the internet and to digital technologies** fundamentally affect chatbot appropriateness and usefulness and should inform whether chatbots are deployed, as well as how they are designed. One issue is that vulnerable people may not easily be able to use chatbots to seek services due to a reliance on shared mobile phones or SIM cards within large communities, or, in the case of gender-based violence, reliance on abusive family members monitoring their communications.

Further, online chatbots have not been found to be useful in areas with low internet access, low smartphone saturation, lower literacy and older populations. As one technologist explained, it is possible to use chatbots in low-bandwidth and low-literacy environments, but doing so requires very **intentional design**. The same goes for accessibility considerations with regards to disabilities. One programme officer found that they successfully increased the accessibility of their chatbot by strategically placing dedicated hardware devices with internet access in community spaces and by using multimedia modalities (sound, video) to reach populations in need of alternative formats.

The safety of vulnerable users is a growing concern

Taking **safety and safeguarding** of vulnerable users into account is a growing priority, with the issue of how best to direct vulnerable users to appropriate human assistance coming up in multiple interviews. One technologist with experience working on gender-based violence argued for the importance of trauma-informed design in chatbot initiatives³³, which would entail a careful consideration of how trauma may affect the individuals using the chatbot.³⁴

Emerging priorities

Pushing for greater coordination on chatbots within the humanitarian sector

Most interviewees call for **greater coordination across the sector on chatbot deployment**, including cross-organisational sharing and learning from security incidents, shared best practices around data policies, localisation, and contextualisation of chatbot language and scripts, federation of chatbot infrastructure and support for local technological expertise in different regions of the world.

Two chatbot technologists we heard from are involved in creating reusable, open source chatbot templates and guidelines on best practice related to specific thematic areas. They spoke of the potential usefulness of a global template library, a set of commonly used chatbot standards and an authority available to help guide humanitarian organisations when they first decide they are interested in creating a chatbot.

Development of more sophisticated, general-purpose chatbots

From some chatbot technologists, we heard a hope for “human-like” sophisticated chatbots to one day be able to engage in complex interactions with information seekers. For now, these are seen as out of scope: interviewees noted that even the natural language programming driving “sophisticated” AI-driven chatbots is not as advanced as organisations may imagine it to be,³⁵ and that no matter how advanced the technology becomes, it will require intensive design, model training and attention to language and context to create the desired interactions with the technology.

Still, several organisations are moving forward with the development of **more complex machine-learning driven chatbots**. One large humanitarian organisation we spoke to is exploring how to expand the use cases of their existing chatbots rather than continuously building new ones for isolated use cases. This kind of expansion will likely have ramifications for data governance (with questions of how to ensure minimised data collection looming large) as well as chatbot project governance considerations to account for a larger set of project stakeholders. These expanded chatbots will also likely require more technical experimentation and dedicated technical resources: one chatbot designer we spoke to notes that the more general purpose such chatbots are intended to be, the more training and maintenance they will require.

CONSIDERATIONS TO GUIDE CHATBOT DESIGN AND DEPLOYMENT

Through our research we have identified several considerations and guiding questions to support the design and deployment of chatbots in the humanitarian sector. These cover assessing the appropriateness of chatbots, putting people at the centre of the design process, operations and budgeting, and privacy and responsible data.

These considerations are not a comprehensive manual to responsibly designing and deploying chatbots in the humanitarian sector. They are a starting point: an introductory (and evolving) set of guiding questions aimed at supporting and informing the thinking of organisations interested in creating their own chatbots. We expect that there will be several questions that could emerge as organisations work through the considerations below.



“Before you start building something you must engage with the people you are trying to reach, and you have to take the time to understand whether the chatbot is the right way to reach them.”



Is a chatbot the most appropriate solution? First, identify the problems you want to address, and keep people at the centre

Building, designing and deploying a chatbot isn't something organisations should do without **meaningful consultation with the people who will be interacting with it**. Their needs and their context should be at the centre of planning, design, deployment, and monitoring of any intervention.

To gauge whether or not chatbots are an appropriate tool for the problems you're trying to address, it is imperative that these people are involved both in identifying what these problems are and in mapping out potential solutions.

The following questions are designed to support organisations in figuring out whether a chatbot is indeed the most appropriate solution to a given problem. In answering these questions, try to be as specific as you can: for example, a general goal might be "improving communications with the communities we're working with", but a more specific goal would be "providing information about a particular health emergency" or "collecting data about crisis situations from people on the move in a particular region". Specificity can help you understand what your organisation expects from a chatbot and what chatbot features and organisational resources would be needed.

- What **problems** are you expecting to address with the creation of a chatbot?
- What have you learned about these problems through **meaningful engagement and consultation** with the communities you're aiming to serve? What are their **needs and priorities**?³⁶
- When it comes designing a **solution** to address the problems above, what would **success** look like for your organisation and for these communities? How would the deployment of a chatbot fit into that?

When it comes to the development of new technologies, it is important to prioritise the design's **effects on those who will be interacting**

with it, over the intentions of the organisation developing the tool.³⁷ The questions below are intended to facilitate further reflection on whether a chatbot is appropriate to the context you're working in and to the needs you're aiming to address.

- What existing **strategies or actions are already addressing** the issues or identified needs of the communities you're working with? How would the deployment of a chatbot be informed by and interact with these?
- What does the local information ecosystem look like? What have you learned through research into the social, geographic, technical and political context of the populations the chatbot would target? Here are a few things to keep in mind when doing this research:
 - » Communities' existing **familiarity with digital tools**, as well as their **access to the internet**, to digital technologies and data, to electricity and more. Also consider potential **inequalities in access** according to factors such as age, gender, class, ability and others.
 - » **Cultural context**, including which messaging platforms people use more frequently, and the ways in which access to smartphones and other digital technologies are mediated by factors such as age, gender, class, ability and more.
 - » The role that **language** would play in a chatbot and how to adequately create readable scripts in local languages and dialects.
 - » The **messaging behaviours** people already have in this context (including cultural differences in emoji use, fluency in multiple languages, and expectations regarding frequency of messages).
 - » The **information needs** of the relevant communities, including the channels people use, trust, and have access to, the issues that are most relevant to them and the ways in which people communicate.
 - » The work of **organisations** that are **trusted members of the local information ecosystem** and who provide information to local communities, including how their efforts would interact with a new initiative and the potential for collaborations.
- What the consequences of deploying a chatbot could be in regions or countries where governments restrict or block populations' access to messaging apps?³⁸

How can you incorporate communities' information needs into chatbot design and deployment?

If, after considering the questions above, you find that designing and deploying a chatbot is the solution your organisation is looking for, it is important to understand how the user communities' needs would inform its design.

Our research found that the deployment of chatbots, like other interventions based on digital technologies, has limited impact if not accompanied by significant investment in creating timely, useful, and context-relevant content. The following questions are intended to help organisations work through some of the issues related to design.

- What would the scope of the chatbot be, and how would it address your various programmatic goals as well as the needs that have been identified?
- What are people's needs when it comes to the **level of interaction or quality of communication**? What are your organisation's needs when it comes to the **level of interaction or quality of communication**? How do those needs compare against the capacities of existing chatbot technologies?

- Related to the above: Has your organisation developed an understanding of the capabilities and features **of existing types of chatbots**?
- How could the design of a chatbot be tailored to **existing** messaging behaviours, linguistic context and information needs?
- How would you make sure **content** provided by the chatbot is accurate, accessible, and tailored to identified needs?
- How would you **inform** and make explicit to the users that they are interacting with a chatbot?
- Some digital technologies can reflect existing power dynamics and their deployment can lead to furthering inequalities or creating new ones.³⁹ How would you ensure your chatbot doesn't perpetuate inequality and discrimination?
- Have you considered approaches such as trauma-informed design and/or design justice principles?⁴⁰
- Testing: How would you conduct research to make sure approaches are indeed effective? This would include pre-design research into key factors that affect accessibility and use before introducing it, as well as efforts to monitor usage patterns.⁴¹

Is a chatbot sustainable long-term? Reflect on operations and budgeting constraints and opportunities.

Our research makes it apparent that the most successful cases of chatbot use in the humanitarian sector required significant research, robust integration with the organisation's operations and communications, as well as continuous iterations to the chatbot's design and content. The questions below point to some of the main issues related to operations and budgeting, which have a strong influence on whether a chatbot is sustainable or not.

- Building trusted relationships with communities is difficult and simply deploying a chatbot will not automatically lead to better communication.⁴² Have you considered **how the chatbot will be integrated into the organisations' services**, other forms of communication and overall information system?
- Do you have capacity (in-house or external) to oversee the implementation of the chatbot and to streamline it with your overall workflows?
- Have you accounted for areas where chatbots might create new/more work for your staff?
- Have you taken into account reputational risks to the organisation?
- Have you budgeted adequately for the chatbot? Costs to consider include translation and localisation costs, tech infrastructure (such as servers and maintenance), and staff costs (such as training existing staff and potentially hiring additional support to design and maintain the chatbot).
- What resources will be needed to maintain and sustain the chatbot's functioning over time in ways that continue to address communities' needs?

How can you consider privacy, security, safety and responsible data practices?

As mentioned earlier in this report, the use of chatbots in the humanitarian sector has been accompanied by concerns regarding responsible data. These concerns include a variety of issues, such as the ways in which the chatbot's data flows interact with existing organisational data policies, and considerations of unintended consequences and risks to people whose personal information becomes a part of those data flows.

The following questions are intended to help surface conversations about some of the risks that might occur in implementing a chatbot and inspire reflection as to how organisations can think about

mitigating those risks (if possible) or pause implementation (where risks are found to be greater than potential benefits).

- Do you have **capacity** (in-house or external) to oversee potential issues related to tech and data infrastructure as it relates to your chatbot?
- Have you conducted a **data protection impact assessment** (DPIA) or other form of risk assessment ahead of design and deployment, and do you have a process in place to evaluate and respond to risks on an ongoing basis?
- Have you weighed the **privacy/security** of the proposed chat platform against the chat platform that's most used by your target population?
- What **hosting arrangements** are you planning on making? How would different hosting arrangements (and, consequently, data management) affect those communities who will be interacting with the chatbot?
- Have you considered whether you will **collect data** from users?
 - » If so, what kinds of data?
 - » Have you mapped out the data being generated and collected?
 - » Have you communicated to the user what data will be generated and collected?
 - » How will collected data and feedback impact programming and improvements?
 - » If there is training data, do you have access to it? Do you know how/where it is or where it will be stored?
 - » Have you considered the unintended consequences that might arise if this data fell into the wrong hands?
 - » Have you considered how bias in data collected through messaging apps and chatbots may affect your work?⁴³
- Have you built in a safeguarding mechanism for vulnerable users?
- Have you considered how malicious actors might exploit the chatbot infrastructure?



Do you have the capacity to oversee potential issues related to tech and data infrastructure?

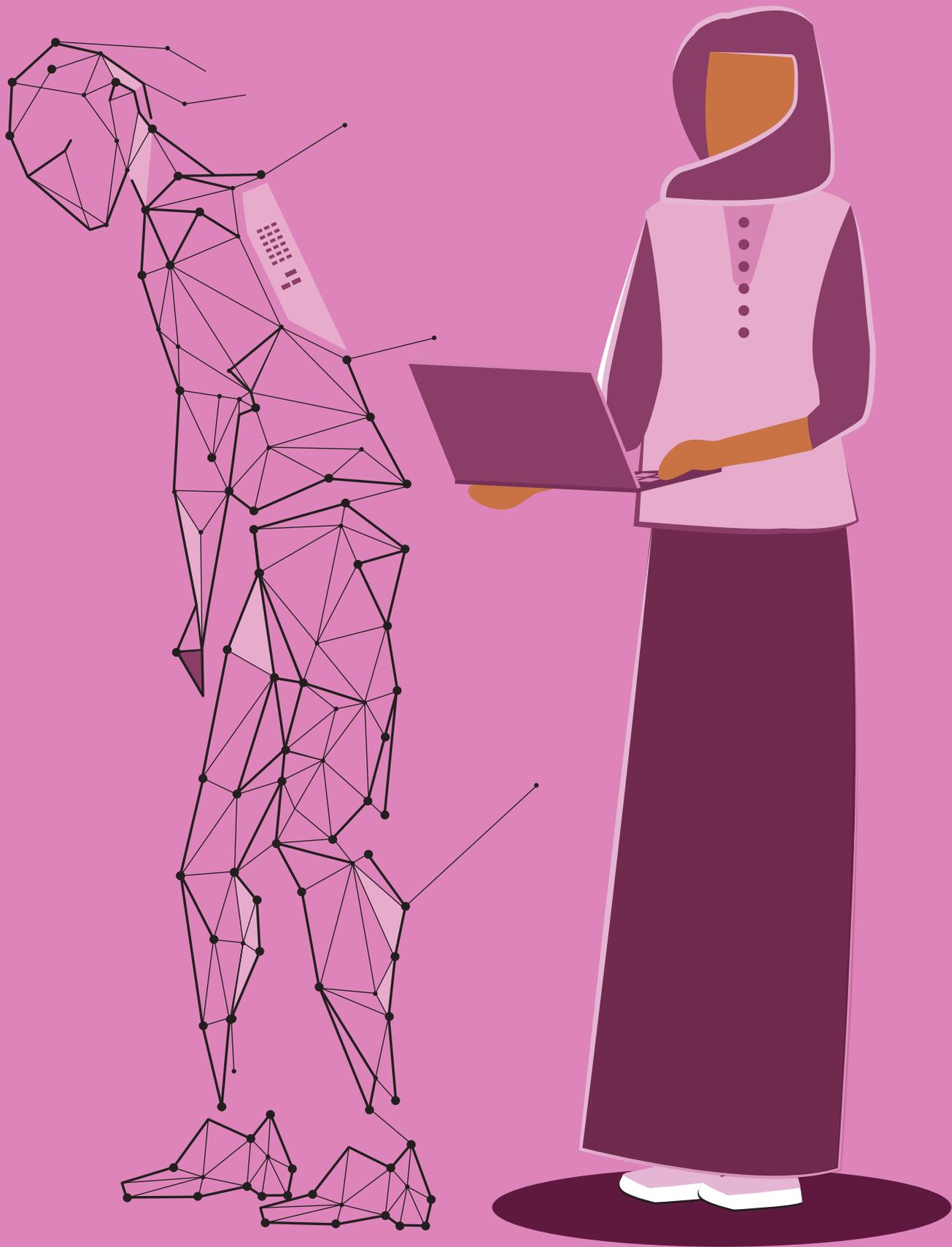


Have you conducted a risk assessment ahead of design and deployment?



Have you weighed the privacy/security of the proposed chat platform?

Any successful chatbot will require at minimum some degree of continued investment and maintenance.



AREAS FOR FURTHER EXPLORATION

As our report shows, responsible and effective chatbot use in the humanitarian sphere involves many different considerations. Through our research, we've identified and touched on several areas and topics that deserve a deeper dive through future inquiry, brainstorming and discussion. These include:

- Deeper contextual exploration of precisely how organisations are integrating chatbots with existing work, surfacing lessons that can bolster staff capacity and increase the efficacy of humanitarian response.
- The development of processes for just and ethical chatbot design together with the communities' humanitarian organisations are trying to reach.
- Experimentation with how chatbots can best complement other communication channels and fit within an organisation's broader communication strategy.
- Greater consideration for how consent is achieved from chatbot users (as well as the limits to consent), the implications of end user licence agreements (EULAs) and the intersections with the ethical imperatives of humanitarian organisations.
- More in-depth focus on accessibility challenges for chatbot users (such as disability, age, low-bandwidth, internet access, low-tech) and how to shape inclusive chatbot design.
- The development of responsible data and digital security best practices regarding user privacy, hosting platforms, data retention and staff training.
- The collection of user feedback from communities using chatbots deployed by humanitarian organisations, with a particular focus on service delivery, automation and whether communities actually want to interact with an automated chat system in the first place. More communication with chatbot users in these studies is critical for gauging chatbot successes and shortfalls.
- Exploring concrete points and processes where humanitarian organisations can collaborate on chatbots: for example, the development of best practices around responsible data use, including the ethics and protection of chatbot training data, safeguarding for vulnerable users or exploring the feasibility and desirability of integrating the services of multiple organisations within one chatbot.

ABOUT THIS RESEARCH

This report is based on research conducted by The Engine Room from October 2022 to February 2023, with funding from the American Red Cross.

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