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Chatbots for Change Playbook

A practical guide and modular toolkit on how to create, grow, and sustain your chatbot for social good

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Created by Kati Collective, with input from Meta.

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Acknowledgements

This playbook was created by Kati Collective, with input from Meta.

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Introduction

By the end of 2021, 3.4 billion people in low-and-middle income countries were using mobile internet.[1] The increasing penetration of mobile network and internet coverage, ownership of affordable smartphones, together with the proliferation of WhatsApp and Facebook in emerging markets has opened new opportunities for positive social impact.

Chatbots, conversational agents providing access to information and services through interaction in everyday language,[2] can make essential information and services more accessible, available, and affordable. Chatbots can operate with low-bandwidth, are designed to be easy and intuitive to use, and can reduce literacy and digital literacy barriers.[3]

While gains related to the uptake of mobile internet, smartphone usage and more have not been equitable, and have in some cases stagnated in the past few years, digital interventions such as chatbots that take into account these barriers and are designed, developed and implemented in the right way have the potential to support a myriad of social impact purposes.

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[1]GSMA The Mobile Gender Gap Report 2023
https://www.gsma.com/r/gender-gap/?ID=a6g1r000000zMOeAAM&JobID=1533085&utm_source=sfmc&utm_medium=email&utm_campaign=CW_Gender_Gap_Report_31_05_2023&utm_content=https%3a%2f%2fwww.gsma.com%2fr%2fgender-gap%2f

[2] https://link.springer.com/article/10.1007/s00607-021-01016-7

[3]https://www.researchgate.net/profile/Petter_Brandtzaeg/publication/318776998_Why_people_use_chatbots/links/597de3e0aca272d56817b560/Why-people-use-chatbots.pdf

Who is the playbook for?

This playbook is intended for anyone working in social impact interested in or already using chatbots to enhance the reach, scope, scale, effectiveness and impact of their work in various areas of the social good space.

What does the playbook offer?

This playbook contains key information, tools, exercises and resources organized into four interrelated modules. The modules are based on barriers and enablers to successfully developing, implementing, scaling and sustaining chatbots for social good as identified by landscaping and desk research, expert and user interviews, as well as lessons learned from the broader digital development field.

The playbook is designed so that it can be read in whole or in parts. It is unlikely that all readers will find all modules useful – your role in an organization, your skillset, where you are along the chatbot project life cycle, what challenges you are facing, and more will all impact which elements of the playbook are most relevant and useful.

Modules are organized in the order below to encourage strategic thinking to be done early on, but contain cross-cutting and overlapping content which spans the project life-cycle.[4]

Analyze the problem,
scope the solution

Define your impact
Monitor, Evaluate and Learn

Plan & Strategize business models and
marketing strategy, Implement, Test, Iterate

Design, Develop & Demo
Pilot, Iterate, Test, Iterate

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[4] https://www.frontiersin.org/articles/10.3389/fdgth.2021.661708/full and https://digitalprinciples.org/about/

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TOOLKIT MODULES

Analyze the problem, scope the solution

Define your impact Monitor, Evaluate and Learn

Plan & Strategize business models and marketing strategy, Implement, Test, Iterate

Design, Develop & Demo Pilot, Iterate, Test, Iterate

Implement and iterate Actualize, embed, integrate and iterate

Scale & Sustain Long-term business models for sustainability

Figure 1. Project Life-Cycle Phases for A Social Good Chatbot & Playbook Modules

Chatbots for Maternal, Newborn, and Child Health (MNCH)

Chatbots for MNCH can act as automated conversational agents - promoting health, providing health education and counseling, prompting behavior change, enhancing linkages to health care through scheduling, reminders and risk stratification, and opening opportunities for feedback on services received.

Chatbots for these use cases, if developed and implemented in the right way with the right partners and enabling environment, could potentially increase health service uptake and cost-effectiveness of health services while narrowing the health and well-being gap.[5]

Throughout this playbook we leverage chatbots for MNCH as examples, given that health as a social good has some of the most robust use cases, best practices, and lessons learned.

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[5] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6704417/

Executive Summary

Analyze
Market Sizing & Scorecard Exercises, Formative Research

Module 1 offers two exercises - the first provides a way to score the potential need, reach and growth for/of a chatbot intervention in your target market(s), and the second exercise helps you size your potential addressable market(s). Module 1 concludes with an overview of how to conduct your formative research, with a suggested list of methodologies and questions to answer in this phase, with a spotlight on Human Centered Design (HCD).

Key Lessons Learned:

❖ A brief desk research exercise can be helpful in identifying your potential addressable market size, exploring initial indications of need, potential reach and growth, which can then be drilled down on in the formative research.

❖ Prioritize formative research early on (pre-implementation) as findings help identify project strategies, define goals and objectives, set targets, and identify key social impact priorities for the content development and more.

❖ Human centered design processes can play a vital role in creating impactful, contextually and culturally relevant digital solutions that have a strong potential for scale, sustainability and system integration.

❖ Your formative research will help identify needs, barriers to and triggers of change to design a theory of change.

❖ In your formative research be sure to look closely at the socio demographic characteristics of the individuals with and without access to and usage of mobile internet. This should be cross referenced with data around "need."

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Define your Impact
Theory of Change, M&E and Learning, Impact Indicators

In this module there is an overview of how to: 1) Create a Theory of Change for your chatbot intervention that feeds into your Monitoring, Evaluation and Learning (MEL) framework. 2) Draft a MEL framework, and 3) Explore key indicators to measure effectiveness and impact to use in your ToC and MEL.

Key Lessons Learned:

❖ Developing a ToC and a MEL framework are key components to support and demonstrate the effectiveness and impact of the chatbot.

❖ A MEL framework helps ensure learnings are captured and turned into iterative changes and improvements in the chatbot.

❖ It is essential to create and implement a MEL framework that informs partners and users at each step the chatbot user journey if the chatbot is reaching its target audience and having the intended effect(s).

❖ Achieving scale can mean different things in different contexts, for different organizations and different chatbots. You should define what scale or growth means for your chatbot and target market(s).

❖ Be sure to clearly define indicators that assess if the chatbot is effective in what it sets out to do in terms of its functionality and ability to engage users, the social impact of the intervention, and if it is cost-effective.

Plan & Strategize
Business Model & Plan

This sub-module covers how to select an appropriate business model based on your chatbot type, use case, market, organizational/ partners capabilities and more, and the basics of what to include in your business plan. There is also an overview of some of the drivers for capital and recurring costs for chatbots and offer a template budget, and exemplify ways to pitch to potential donors/ payors.

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Key Lessons Learned:

❖ There are many business models you can consider to secure funds for the chatbot at various stages of growth - from development to pilot phase, as it is implemented and at scale.

❖ Business models range substantially depending on what the chatbot does, team capabilities and more, as do the types of payors or donors you might target with them.

❖ Lack of research on cost effectiveness limits the sustainability of digital health projects, so prioritize creation of a theory of change and MLE framework early on and link indicators and findings to how you pitch to payors and donors.

❖ The biggest cost related to chatbots is the cost of the conversations. After conversation costs, costs are largely based on: marketing and promotion, chatbot type, use case, who will build your chatbot, and integration. Prioritize which of these are worth it to bring about the desired social impact change.

❖ Recurrent costs at scale are more significant than set up costs, so plan ahead and budget for capital and recurrent costs for the core activities which comprise the development, implementation and growth/scale of the chatbot.

Plan & Strategize

Marketing Strategy

In the first half of this sub-module there are considerations, tips and tricks for marketing your chatbot, and an outline of various channels you could explore - both digitally and non-digitally- to acquire your users.

Key Lessons Learned:

❖ In marketing the chatbot, consider how the persona, name and logo can be used to make the chatbot more memorable and recognizable.

❖ Offline marketing can be very expensive at scale. As such, partnerships are key - either with the government to market as part of its existing promotions or partnerships with fast-moving consumer goods companies.

❖ Digital marketing and user acquisition may be more cost effective, but carefully test these methods to determine if your users are digitally literate and digitally connected enough to navigate and utilize.

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❖ User onboarding is essential to make sure end users understand how to use the chatbot, what it is and isn't capable of, how to opt in and out, and how their data will be used.

❖ The chatbot needs to have a privacy policy aligned with privacy and data protection legislation in the country in which it will be implemented, or if there is no legislation, then ideally with privacy and data protection best practices e.g., General Data Protection Regulation (GDPR[6]).

Plan & Strategize

Partnerships

This sub-module explores partner types and activities, outlines principles for successful partnerships, and provides an opportunity for you to think through partner roles and level of effort (LOE) along the chatbot life cycle in a Partner Engagement Mapping Worksheet.

Key Lessons Learned:

❖ Digital development projects are done best through a consortium of partners across sectors. Clearly articulate and agree in writing roles and responsibilities of each from the start - bearing in mind that these and the LOE for each will evolve throughout the program life cycle.

❖ It is essential to set-up clear governance structures during the pre-implementation phase to build trust, mutual understanding, inclusiveness and ownership among partner organizations, as well as to clearly outline terms, roles and responsibilities early on to avoid confusion and redundancy. RASCI matrices[7] are a useful tool in this process.

❖ Governments can be both great enablers and barriers to scale and sustainability. Being able to forge and successfully navigate government relationships is fundamental. However, significant time and resources are required to broker these relationships and hand over digital programs successfully.

❖ Depending on the country(ies) where you are working, you may have multiple government partners and these agencies may not have the same priorities.

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[6] https://gdpr.eu/what-does-it-stand-for/

[7]

Some may be more enthusiastic about the potential for technology than others. Carefully considering all these entities individually is essential.

❖ Your most important partner is of course, the end user. Close collaboration with your end users at all stages of the process through human centered design and other participatory processes is not only appropriate and respectful, but key to the effectiveness and impact of your chatbot in addressing the problem it seeks to address.

Design & Develop
Content

This sub-module outlines and provides tools for the following steps
1. Topic mapping, 2. Creation of engaging content, 3. User testing 4. Adapting your content to the local context, and 5. Expert review and approval.

Key Lessons Learned:

❖ Test it! Again and again and again with representative users.

❖ Content should be the result of intensive collaboration, at the heart of which are your users. You will need to work closely and from the start with your user group and key partners to ensure that your carefully crafted content reaches the right users, in the right format.

❖ Consensus on content takes time, but it is vital to have buy-in, input and approval from all those involved across partnerships in order to gain support. Think about other work streams you can conduct in parallel to the content approval process to save time.

❖ Investing in quality content is a key element of success. However much you spend on the technology, if the content is not right, the end user will not engage with or learn from the chatbot and/or convert knowledge into action.

❖ Even though one of the main critiques of chatbots is that they are incapable of conveying emotions, carefully crafting and deploying a user persona for your chatbot may be a helpful tool to build an emotional connection and deeper engagement with your users.

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Design & Develop

Tech Considerations

While this playbook is not intended for chatbot developers specifically, nor does it have a deep technical focus, it is important for anyone involved in developing, implementing or scaling a chatbot for social good to have a basic understanding of some of the relevant technical considerations and a general grasp of the key terminology.

As such, this section contains a basic overview of the different types of chatbots with some key considerations and examples, a brief description of key technical partners and how to select the right one, an exercise on designing conversational flow, and a simple description of what a chatbot knowledge base is.

Key Lessons Learned:

❖ Know when to link chatbot users to a human. It is both a requirement of WhatsApp policy but also a key way to serve your users to know when to link them to a clear human component as part of chatbot design and functionality. However, this can be quite expensive and tricky to scale and transition to government.

❖ Content coverage of your knowledge base can significantly impact the quality of the content and perceived usefulness of your chatbot, so prioritize these areas.[8]

❖ Creating an interactive visual map of how content or decisions made by your chatbot will flow (also known as a chatbot conversation flow diagram - it's the blueprint used by engineers to configure/build the chatbot) can make this somewhat confusing web of pathways more concrete.

❖ Knowledge domains are somewhat like your chatbot's brain. Depending on what your use case is, your chatbot will have a bigger brain (requiring more time, resources, training, etc) or a smaller, simpler, closed brain for more limited and concrete tasks and Q&A.

❖ Your Business Service Provider (BSP) may be able to provide technical assistance and templates for both designing your conversational flows and

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[8] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7970298/

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building a knowledge base. If you will need assistance in these areas, consider including them as you vet potential technical partners.

Chatbot Use Cases

Social good chatbot use cases may include provision of information, training and learning, broad support services, reporting and data analysis across areas such as health, education, environmental sustainability, gender equity, civic participation, crisis and humanitarian response, youth participation and much more.

This playbook offers an overview of use cases for patient-serving[9] chatbots focused on **maternal, newborn, child health** (MNCH).

WHO's Digital Health Taxonomy[10] was used as an inspiration to outline how chatbots can **address health system challenges** with specific functionalities (Figure 2) and also to outline MNCH Patient-Serving Chatbot Use Cases in more detail (Figure 3). These overviews are meant to be comprehensive and illustrative, but are **by no means exhaustive**, as new solutions are emerging rapidly.

Chatbot use cases vary based on the **challenges** they aim to address, the **context** in which they are **implemented** and for which end users they are intended. Findings from formative research should be used to inform use case selection.

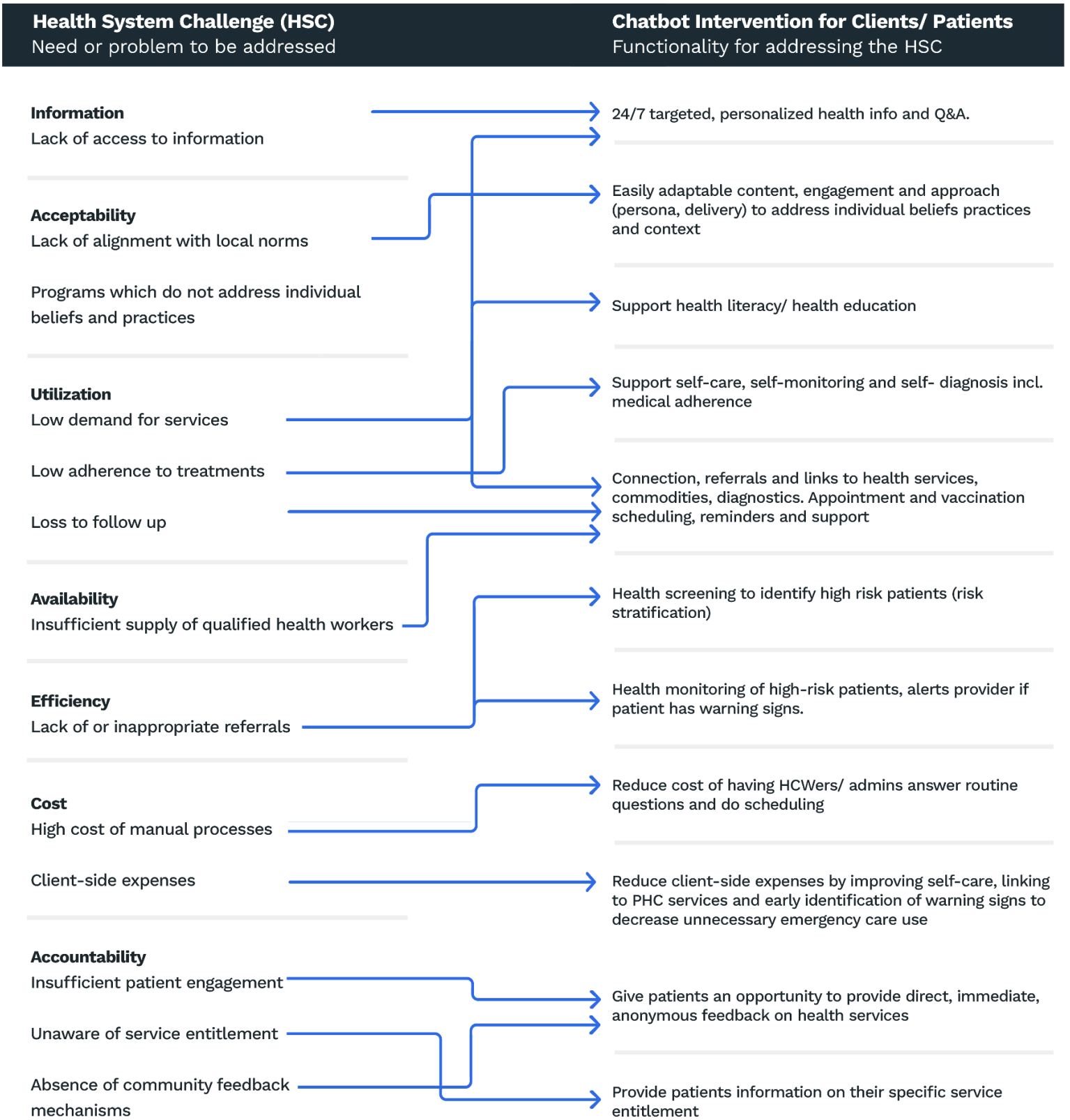Many chatbot use cases employ a **combination of two or more** of the use cases outlined below.

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[9]We outline chatbot use cases focused on supporting/ addressing the client or patient specifically, as well as those that dually link patients to health care workers, administrators or other human resources for health.
[10] https://apps.who.int/iris/bitstream/handle/10665/260480/WHO-RHR-18.06-eng.pdf

Health System Challenges & Patient Chatbot Interventions for MNCH

Health System Challenge (HSC) Need or problem to be addressed	Chatbot Intervention for Clients/ Patients Functionality for addressing the HSC
Information Lack of access to information	24/7 targeted, personalized health info and Q&A.
Acceptability Lack of alignment with local norms	Easily adaptable content, engagement and approach (persona, delivery) to address individual beliefs practices and context
Programs which do not address individual beliefs and practices	Support health literacy/ health education
Utilization Low demand for services	Support self-care, self-monitoring and self- diagnosis incl. medical adherence
Low adherence to treatments	Connection, referrals and links to health services, commodities, diagnostics. Appointment and vaccination scheduling, reminders and support
Loss to follow up	
Availability Insufficient supply of qualified health workers	Health screening to identify high risk patients (risk stratification)
Efficiency Lack of or inappropriate referrals	Health monitoring of high-risk patients, alerts provider if patient has warning signs.
Cost High cost of manual processes	Reduce cost of having HCWers/ admins answer routine questions and do scheduling
Client-side expenses	Reduce client-side expenses by improving self-care, linking to PHC services and early identification of warning signs to decrease unnecessary emergency care use
Accountability Insufficient patient engagement	Give patients an opportunity to provide direct, immediate, anonymous feedback on health services
Unaware of service entitlement	
Absence of community feedback mechanisms	Provide patients information on their specific service entitlement

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MNCH Patient-Serving Chatbot Use Cases

Chatbots can provide multiple functions, and many functions are interrelated. While this overview is focused on patient serving bots, many are also health workers and health administrator serving/ facing.

1 Targeted Client Information

- 1.1 Transmit 24/7 targeted, tailored health information
- 1.2 Provide real-time Q&A on key health topics

2 Health Education & Counseling

- 2.1 Provide health education through information combined with targeted interactions and/ or gamification.
- 2.2 Provide health counseling on appropriate topic areas e.g., mental health, NCDs with referral linkages to health care provider

3 Self-care, personal health tracking

- 3.1 Support self-care for specific health conditions (e.g., gestational diabetes, hypertension, smoking cessation, gestational weight gain)
- 3.2 Provide tools and resources for self-monitoring of specific conditions with referral linkages
- 3.3 Support with medical adherence reminders, guidelines, Q&A

4 Apt scheduling, reminders, follow-up

- 4.1 Appointment and vaccination scheduling assistance
- 4.2 Appoint reminders, support and follow-up

5 Lead consumers to service options

- 5.1 Facilitation of a discovery process of health care service and product options
- 5.2 Provide targeted recommendations, referrals, and direct links to health services, health commodities, services, pharmacy options, diagnostics and more

6 Health Screening, risk stratification & referrals

- 6.1 Health screening to identify high risk patients
- 6.2 Health monitoring of high-risk patients
- 6.3 Alerts provider if patient has warning signs.

7 Mechanism for accountability

- 7.1 Provide channel for direct, immediate, anonymous feedback on health services
- 7.2 Provide patients information on their specific service entitlement

Figure 3. MNCH Patient-Serving Chatbot Use Cases

Below is a list aligned with the MNCH Patient-Serving Chatbot Use Cases from Figure 2 with more information and examples. The examples provided are not all MNCH specific, but related instead to the use case.

1. **Targeted Client Information:** Chatbots can provide 24/7, targeted and/or tailored personalized health information[11] and real-time Q&A on health topics. Some of the benefits of this use case include anonymity, quality and the speed of receiving and sharing information in comparison to popular search engines, and the relative ease of tailoring, targeting and adapting content.
   ★ An example[12] is the use of a WhatsApp chatbot that addresses COVID-19 vaccination concerns among pregnant and breastfeeding women in rural North India.

2. **Health Education & Counseling:** Chatbots can provide health education and counseling, which may be aimed at improving health literacy.[13] Chatbots can make health-related learning easy, fun, and engaging, potentially leveraging gamification and other features. In most cases, chatbots that provide health counseling serve the function of complimentary support and are not a replacement for a medical expert.[14]
   ★ An example[15] is the Woebot chatbot for postpartum mental health which encourages mood tracking and delivers perinatal-specific psychoeducation as well as tailored empathy, behavioral pattern insight, and cognitive behavioral therapeutic elements.

3. **Self-care, personal health tracking:** Chatbots can support self-care, management of certain health conditions, and provide the tools and resources for self-monitoring and medical adherence[16] support. Automated chatbots can provide general health screening, but for further concerns, complaints, and follow-up patients should be offered the opportunity to directly chat or communicate with a clinician to avoid self-diagnosis.[17]

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[11] Tailored messaging is when messages are tailored to the individual user, targeted messaging is when messages are designed for a particular user segment but not individual.
[12] https://vaccineconfidencefund.org/wp-content/uploads/2022/08/VCF-Insights-Report-Aug-2022.pdf
[13] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8144870/
[14] https://dl.acm.org/doi/10.1145/3359272
[15] https://www.sciencedirect.com/science/article/pii/S2666577823000060
[16] Medical adherence can be defined as the extent to which a person's behavior regarding medication corresponds with agreed recommendations from a healthcare provider.
[17] https://www.mdpi.com/2227-9709/9/4/88

★ An example[18] is the Vik chatbot designed to empower patients with breast cancer and their relatives. The average compliance of patients using the medication reminder feature improved by more than 20%.

4. **Appointment scheduling, reminders and follow-up:** Chatbots can connect people to specific, localized, in-network, health services including providing appointment and vaccination scheduling, reminders and support.[19] In this use case, chatbots often enable providers to offer a higher level of customer service while reducing overhead administrative costs.

   ★ An example[20] is the CHEC-UP chatbot, aimed at reducing disparities in immunization completion. It focuses on pre-visit engagement by delivering (AI powered) personalized messages and facilitating appointment scheduling. CHEC-UP also provides anticipatory guidance prior to an appointment.

5. **Lead consumers to service options:** Chatbots facilitate a discovery process whereby they assist people on a health care journey (often by providing health information or counseling like in use cases 1 or 2) which leads to targeted recommendations, referrals, and direct links to health services, health commodities, pharmacy options, diagnostics and more. This use case is especially useful in markets where there is a low level of knowledge of health needs among the target user group(s) if the users have sufficient income to buy the products or services being marketed. Additionally, this use case can be useful in terms of developing a sustainable business model for the chatbot as there are many potential payors whose services and products benefit from a recommendation or link, or consumer/market insights that stem from the data generated information.

   ★ An example is Saathealth's[21] chatbot which covers Family Health in India, provides information to bot users across a number of key health verticals and also links out to related health services, commodities, pharmacy options, diagnostics and more based on the user journey.

6. **Health screening, risk stratification & referrals:** Chatbots can provide risk assessments and stratification of end users/ patients, as well as offer

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[18] https://www.scirp.org/journal/paperinformation.aspx?paperid=101598
[19] A study of 100 physicians in the US concluded that the majority believed chatbots could assist with scheduling doctors' appointments and locating health clinics. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6473203/
[20] https://telehealthandmedicinetoday.com/index.php/journal/article/view/375
[21] https://www.saathealth.com/

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monitoring of high-risk patients (which links providers and patients), including providing alerts if a patient has warning signs. AI chatbots can utilize data and prediction algorithms[22] to enhance diagnostic accuracy and enable clinicians to offer patient-centered medical care.[23] This use case can be a time-saving and a useful way to triage patients to appropriate healthcare services.

★ An example[24] is an algorithm capable of accurately predicting the week of delivery supporting the identification of a preterm birth (PTB) in Brazil. This algorithm could be adapted to work conjointly with a chatbot to use messaging from patients to process the information, and then apply the algorithm of prediction to forecast the week of delivery and a possible risk score.

7. **Mechanism for Accountability:** Chatbots can offer end users an opportunity to provide direct, immediate, and anonymous feedback on health services and also provide patients information on their specific service entitlement.

★ An example[25] is the MomConnect chatbot in South Africa which provides pregnant women an interactive mechanism to give feedback on the service they have received (linked via a specific facility code) - from the quality of the care, to what was and wasn't provided or covered in the appointment (in addition to automated updates about scheduling future prenatal appointments and targeted health information).

In addition to various use cases for chatbots, there are also different types of chatbots, enabled by a range of technologies and services with different levels of sophistication.[26] These chatbot types, with descriptions, use cases, pros and cons can be found in the section below.

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[22] https://www.sciencedirect.com/science/article/pii/S2667193X21000454
[23] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6704417/
[24] https://www.sciencedirect.com/science/article/pii/S2667193X21000454
[25] https://www.npr.org/sections/goatsandsoda/2023/04/14/1169988604/a-robot-answers-questions-about-health-its-creators-just-won-a-2-2-million-prize
[26] https://link.springer.com/article/10.1007/s00607-021-01016-7#Sec9

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Analyze
Market Sizing & Scorecard Exercises, Formative Research

Could a chatbot intervention be the right solution to the problem you are trying to solve in your particular context? If so, who are you trying to reach with your chatbot intervention? What is your potential addressable market? Are some geographies/contexts better suited to these kinds of interventions?

Analyzing and planning[27] involves gathering data to develop knowledge about:

→ **Who** are you specifically trying to reach with your chatbot intervention?

→ **What is the context** in which these users live?
- What is the cultural/socio-economic context related to the social good issue area.
- What are the barriers to changes in practice, adoption of services and potential triggers of change?
- What is the market and technology environment, including regulatory considerations?

→ **What is the enabling environment for growth and sustainability** - the political landscape, policies and regulations, active donors, implementers and digital development initiatives in the implementation area?

Having a **clear understanding** of each of these areas underpins much of what you need to determine your strategy and is paramount to the success of your chatbot intervention.

To help answer these questions, Module 1 offers two exercises - the first provides a way to **score the potential need, reach and growth** for/of a chatbot

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[27] https://digitalprincip.wpengine.com/principle/understand-the-existing-ecosystem/

intervention in your target market, and the second exercise helps you **size your potential addressable market**. Module 1 concludes with an overview of how to conduct your **formative research**, with a suggested list of methodologies and questions to answer in this phase.

Need, Reach & Growth Scorecards

One quick exercise to explore these questions is **an initial investigation** that you can do at your desk, today!

The key idea behind the Need, Reach and Growth Scorecards is to compile a quick multi-dimensional snapshot that highlights **potential opportunities and barriers** for potential chatbot impact, reach and growth in specific markets.

This exercise is meant to be done as **rapid desk research**, which leads into and informs the formative research phase that will be considerably more robust and ideally be conducted on the ground (see Formative Research). The exercise will also guide you to subsequent modules and sub-modules in the Playbook based on findings.

We suggest Scorecards cover a minimum of three domains:

1. NEED: What is the potential **need** for a chatbot intervention for your (social good area of) work in your target geography(ies)?
- What is the problem and the size of the problem?
- Who is experiencing the problem?
- Where within the target geographies is the problem the worst (rural vs. urban areas, subnational, etc.)? Why?
- What do trends look like over the past 10 years? What has changed and what hasn't? Why?
- What other interventions to address the problem exist (which are being delivered by the government?) Are they effective and impactful? Why or why not?

- What is the gap that your organization and chatbot intervention is trying or will try to address?
- Can your goals in solving or addressing this need or problem be achieved with a chatbot alone? Or, do you need to build channels or linkages to other systems, pathways and partners? (For example, in most LMICs, if the chatbot involves health care workers, then it will need to interface with the public health system)

2. REACH: Can you potentially **reach** your target users via a chatbot intervention?

- What does mobile network and internet coverage look like in your target geography?
- Do your target users (those experiencing "the problem") own a smartphone? Do your target users use a smartphone? If they do not own their own smartphone, whose do they use and when?
- Does your target group use mobile internet, social media, messaging apps, or WhatsApp?
- Do they have the literacy and technical literacy required to use a chatbot?
- How do target users get their information, services, etc. related to the problem?

3. GROWTH: What is the potential for growth of your chatbot intervention? What is the **policy and financing infrastructure** to support this work in your target market?

- Is digital development prioritized by the government at the national level through dedicated bodies/mechanisms?
- Is digital development included in relevant national strategies/ plans/ budgets?
- Are there active national digital for development strategies in place?
- Is there financing allocated for your social good purpose/ area of need? What are the domestic resources? What are the donor resources?

You should **tailor the indicators** in each domain to your specific use case or intended chatbot intervention if you already know what that will be.

Scorecard Exercise with MNCH as an example:

We provide an example for what the **Scorecard Exercise** would look like for a chatbot intervention focused on MNCH below and select just **five indicators** for each domain to be concise.

1. NEED: *What is the potential **health need** for a chatbot intervention for MNCH in your target market(s)?*[28]

☐ Maternal mortality ratio[29]

☐ Child under 5 mortality ratio[30]

☐ Percentage of women aged 15-49 attended by any provider at least four times during pregnancy[31]

☐ % institutional delivery[32]

☐ % of children reached with the third dose of pentavalent vaccine, which protects against diphtheria, tetanus, pertussis (DTP3), hepatitis B and Hib[33]

2. REACH: *Can you potentially **reach** your target users via a chatbot intervention?*[34]

☐ % of individuals using the internet[35] (ITU Data[36]) (ideally by women in keeping with the MNCH example)[37] but *not available for all countries*.

☐ Adult female literacy[38][39]

☐ Affordability of an entry-level internet-enabled handset in LMICs - apply to your region not available by country[40]

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[28] In your formative research this data would be disaggregated by socio demographic characteristics if possible - i.e. are the mothers and children who are dying from the poorest, least educated, most disadvantaged communities who are unlikely to own smartphones or more importantly, cover the ongoing cost of buying data? In some countries this information is available in National Family Health Surveys.

[29] https://www.who.int/publications/i/item/9789240068759

[30] https://data.worldbank.org/indicator/SH.DYN.MORT

[31] https://data.unicef.org/topic/maternal-health/antenatal-care/#:~:text=Antenatal%20visits%20present%20opportunities%20for,different%20models%20of%20antenatal%20care.

[32] https://data.unicef.org/resources/sowc-2021-dashboard-and-tables/

[33] https://immunizationdata.who.int/

[34] In your formative research go further to look at what are the socio demographic characteristics of the individuals with access to the internet, and of those who don't use the internet. This needs to be cross referenced with the need data, because you may find that the need doesn't exist among the population who is literate and using the internet.

[35] Refers to the proportion of individuals who used the Internet from any location in the last three months. Access can be via a fixed or mobile network.

[36] https://datahub.itu.int/data/?i=11624

[37] https://datahub.itu.int/data/?i=11624&d=Gender

[38] Literacy and digital skills are ranked as the top barrier to mobile internet adoption by both male and female mobile users across survey countries who are already aware of mobile internet. (GSMA Mobile Gender Gap Report 2022)

[39] https://data.worldbank.org/indicator/SE.ADT.LITR.FE.ZS

[40] https://www.gsma.com/r/wp-content/uploads/2022/12/The-State-of-Mobile-Internet-Connectivity-Report-2022.pdf?utm_source=website&utm_medium=download-button&utm_campaign=somic22

☐ Gender gap in mobile internet use - *Apply to your region if not available for your country*[41]

☐ Urban population (% total population)[42][43]

3. GROWTH: *Does your target market/geography(ies) have funding, policies, and plans for digital health MNCH in place that will support the* **growth** *of your chatbot intervention?*

☐ Active National eHealth Strategy (yes/no)[44]

☐ Domestic general health expenditure PPP[45]

☐ External health expenditure PPP[46]

☐ Examples of prior/ current scaled/ sustainable digital interventions at scale, supported by the government? (yes/no)[47]

☐ Cost of WhatsApp messaging per country[48] vs. SMS[49][50]

Create a Scorecard by pulling together your indicators (access it [here)](#)

Using our MNCH chatbot intervention indicators from above, example Scorecards are created for three markets: Brazil, India and Nigeria, which all have quite different potential opportunities and barriers across the three axes.

Indicators are **coded** green (high need/opportunity), yellow (moderate need/opportunity) or red (low need/opportunity) based on ranges for each. These rankings are coded into the powerpoint template but are highly subjective and context specific. Consider your own methodology for coding.

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[41] https://www.gsma.com/r/wp-content/uploads/2021/09/The-State-of-Mobile-Internet-Connectivity-Report-2021.pdf
[42] In LMICs, adults in rural areas are still 33% less likely to use mobile internet than those living in urban areas (GSMA State of Mobile Internet Connectivity Report 2022)
[43] https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS
[44] https://www.who.int/observatories/global-observatory-for-ehealth/policies
[45] https://data.worldbank.org/indicator/SH.XPD.GHED.PP.CD
[46] https://data.worldbank.org/indicator/SH.XPD.EHEX.PP.CD
[47] https://www.digitalhealthatlas.org/en/-/
[48] https://developers.facebook.com/docs/whatsapp/pricing/
[49] https://www.twilio.com/sms/pricing/br
[50] ≥1 M conversations per month could be a free for health use case if organization is an NGO or a government via current WA pricing model Double check that this is still the current policy!

Meta

🇧🇷 BRAZIL

1. Health (MNCH)	2. Digital	3. Growth
MMR **59**	% Individuals using internet **81%**	Digital Health Strategy – Active strategy 2020 - 2028
Child Under 5 Mortality **15**	Literacy Rate Adult Female **95%**	Domestic health expenditure PPP **$1,497**
% of women 4 ANC visits **93%**	Cost entry-level internet enabled handset in LAC, & monthly GDP **10%**	External health expenditure PPP **$2**
% Institutional deliveries **99%**	Gender gap for LAC region in mobile internet use **2%**	Gov-supported digital health precedent? (yes/no) **Yes**
% children reached with pentavalent vax **68%**	% population in urban areas **87%**	Cost of WA messaging vs. SMS beyond 1 M messages per month **.05 vs .06 USD, 17% cheaper**

High need / Opportunity   Moderate need / Opportunity   Lower need / Opportunity

🇮🇳 INDIA

1. Health (MNCH)	2. Digital	3. Growth
MMR **143**	% Individuals using internet **46%**	Digital Health Strategy – **Part of National Digital Health Mission**
Child Under 5 Mortality **33**	Literacy Rate Adult Female **66%**	Domestic health expenditure PPP **$231**
% of women 4 ANC visits **58%**	Cost entry-level internet enabled handset in SA, & monthly GDP **23%**	External health expenditure PPP **$2**
% Institutional deliveries **79%**	Gender gap for SA region in mobile internet use **36%**	Gov-supported digital health precedent? (yes/no) **Yes**

Meta

% children reached w/ DPT 3rd dose **85%**	% population in urban areas **35%**	Cost of WA messaging vs. SMS beyond 1 M messages per month **.0066 vs .049, 87% cheaper**

NIGERIA

1. **Health** (MNCH)	2. **Digital**	3. **Growth**
MMR **917**	% Individuals using internet **55%**	Digital Health Strategy – **Part of National Health Insurance Scheme 2020– 2030 strategy**
Child Under 5 Mortality **114**	Literacy Rate Adult Female **53%**	Domestic health expenditure PPP **$74**
% of women 4 ANC visits **57%**	Cost entry-level internet enabled handset in SA, & monthly GDP **25%**	External health expenditure PPP **$21**
% Institutional deliveries **39%**	Gender gap for SA region in mobile internet use **37%**	Gov-supported digital health precedent? (yes/no) **Yes**
% children reached w/ DPT 3rd dose **56%**	% population in urban areas **53%**	Cost of WA messaging vs. SMS beyond 1 M messages per month **.0516 vs. .579, 91% cheaper**

Create a Comparison of Scorecards

If you are working across several markets or are **considering where** to implement a chatbot intervention, it may be helpful to place your scorecards side by side and **compare barriers and opportunities** across the domains.

Figure 5. Comparison of Scorecards

1. **Health** (MNCH)	2. **Digital**	3. **Growth**

Meta

	MMR	CU5M	ANC	Inst. Delivery	DPT 3rd dose	Internet users	Female Lit Rate	Smart phone cost % GDP	Gender gap mobile internet	% pop in urban areas	Strategy	Dom health PPP	Ext health PPP	Dig health prec	Savings WA vs SMS @ scale
🇧🇷	81	95	93	99	68	59	15	10	2	87	yes	$1,497	$2	yes	17%
🇮🇳	143	33	58	75	89	46	66	23	36	35	yes	$231	$1	yes	87%
🇳🇬	917	114	57	39	56	55	53	25	3	53	yes	75	21	yes	91%

High need / Opportunity   Moderate need / Opportunity   Lower need / Opportunity

Next, you can **use findings** from the Scorecard Exercise to help identify key areas to explore more in your formative research, and to plan partnerships, and resources related to the level of operational and technological capabilities required to reach and engage your expected users.

Suggestions along these lines are made for the **MNCH example below**.

Health needed

LOWER NEED / OPPORTUNITY

☐ In formative research **explore morbidity** (the state of being unhealthy for a particular disease or situation) **not just mortality** (death) for the user group in your context.

☐ In formative research look deeper into **sub-national indicators** - for example are there pockets of **disadvantaged or marginalized groups** with poor health outcomes that national level data obscures?

☐ In formative research consider trends **over the past decade** - are key health indicators improving or worsening? For whom? Why?

☐ What **context-specific health needs** are there that a chatbot could uniquely address beyond mortality and morbidity - examples: Mental health? Self-efficacy? Responsive parenting?

ⓜ Meta

☐ In formative research dig deeper in causes of morbidity and mortality, and **determinants** for health.

☐ Consider what a chatbot intervention can actually do to address health needs of your user group(s) - including how it may be **part of a larger program** or systematic effort.

Digital Reach

LOWER NEED/ OPPORTUNITY

☐ In formative research look at **enablers** and barriers to **digital access** for your user group specifically - not just the general population at national level.

☐ In your formative research look at **trends in digital usage and uptake** - for example is WhatsApp rapidly scaling in your region? Perhaps your user group isn't actively using it now, but will be soon.

☐ Consider methods of engagement that leverage **partner device use**. For example, could pregnant women access a chatbot on their husband's phones?

☐ Consider exploration of ways to potentially **leverage other channels** to complement the chatbot (IVR or voice messages, etc.)

☐ Consider **non-digital marketing and user acquisition methods** (see related sub-module below) to reach, onboard, and get your target users started, however, these have significant implications for cost and scale.

HIGHER NEED/ OPPORTUNITY

☐ In your formative research look **deeper at the digital profile and socioeconomic characteristics** of your target user group(s) specifically, explore **sub-national indicators.**

  ★ *For example, at a national level, Brazilian women look highly reachable via a WhatsApp chatbot - literate, urban based, with the majority using the internet. But if you planned to target adolescent mothers of a lower socioeconomic group in rural areas in Northern Brazil, the digital reach profile is quite different. A real world*

∞ Meta

example of this is how the program CRIA[51] in the state of Algoana, Brazil used voice messages to engage this target user group over WhatsApp to overcome literacy barriers.

Growth

LOWER NEED/ OPPORTUNITY

☐ Go to the partnerships section to learn more about **finding the right organizations** to potentially partner with to help unlock some of the barriers to scale and sustainability in your context.

☐ Review the sustainable business model tool to learn more about **potential payors/ donors** beyond just government, bi- and multi-laterals (covered in the indicators in this scorecard exercise) at **varying levels of scale** with relevant considerations.

HIGHER NEED/ OPPORTUNITY

☐ In formative research look at the current policy landscape in more detail - what are the **trends** in health financing? How long will the current administration hold office and what are the **implications of regime change** on these policies and the enabling environment for digital health?

☐ Review the digital health strategy of your target country(ies) in more detail to better **assess the fit** of the proposed chatbot and approach.

☐ Review in more detail funding allocated for and strategies related to **specific health areas** the chatbot use case will focus on.

☐ Review the Partnerships module for **how to utilize the full range of partners** to grow or scale your intervention, and Business Model & Plan module for tips on how to fund your intervention at **varying levels of scale.**

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[51] https://www.cria.al.gov.br/o-programa/

Meta

Market Sizing Exercise

What is your potential addressable market?

Sizing the potential market can be a valuable exercise in the early stages of exploring the need for and feasibility of a chatbot. Knowing your market potential can help you:

→ **Define goals** for scaling or growing the reach of your intervention (e.g. what percentage of the market to project to acquire as users e.g., "we aim to reach 15% of our addressable market by the third year of the intervention which would be 100,000 women")

→ **Plan ahead and calculate resources** required to sustain the intervention at various stages of growth (use this figure in the budget template below)

→ **Pitch potential impact** - both in terms of outcomes and in terms of cost-effectiveness- to potential donors and payors (see the Plan & Strategize section below)

Market sizing for the purpose of this exercise is defined as estimating the number of end users of a chatbot intervention.

The below offers a **top-down approach**[52] to calculate the potential addressable market. This involves defining an estimate of the **overall market or "universe,"** then applying **filters** that reduce the figure to an estimation of the **"net"** market that you intend to and are potentially able to reach with your chatbot. Defining the market is about understanding and describing **who** you are trying to reach and using those **defining characteristics** as filters.

You will use a different universe and filters depending on what type of chatbot you plan to or are using. **Potential filters may include**: gender, age, location,l, education level, literacy, WhatsApp use (or a proxy indicator, for example

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[52] IFC Market Sizing

mobile internet use, if WhatsApp use data is not available), socio-economic status, household income, displaced population, health status, and more.

GENERIC EXAMPLE

UNIVERSE — Number of people of a particular gender and age in target market

FILTER A — % of population urban

FILTER B — % of that population using WA (e.g. of that gender/age urban setting)

Estimated Net Market
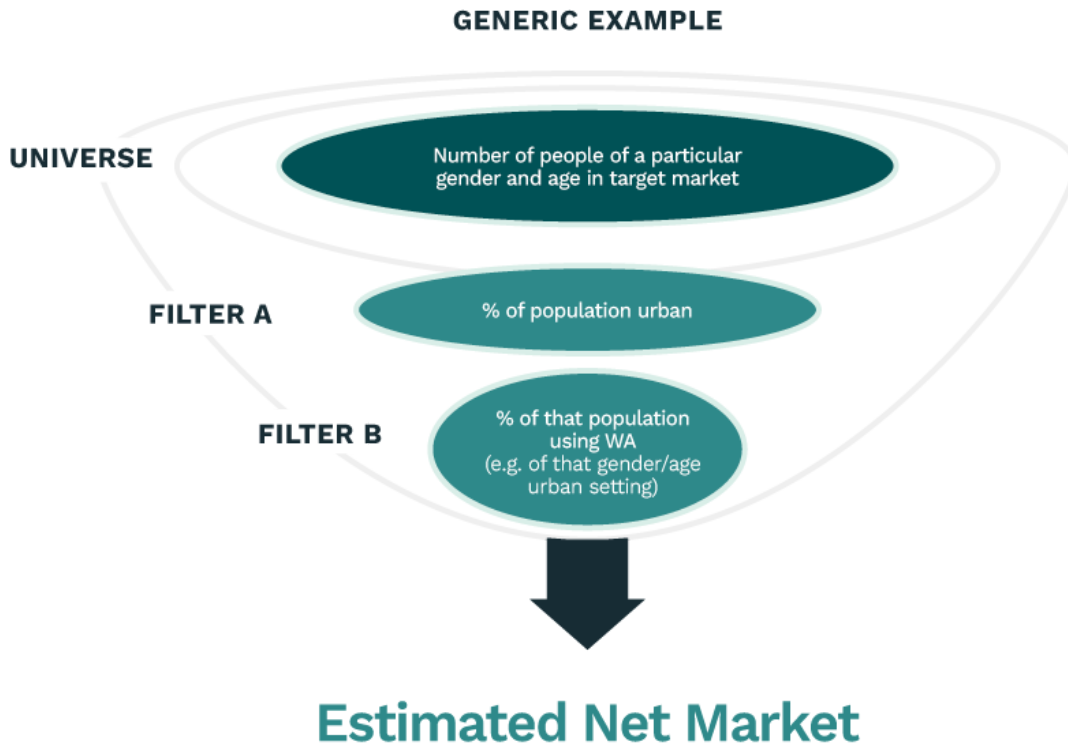
Figure 6. Generic Example of Market Sizing Calculation

Market Sizing of MNCH Chatbot in Brazil as an Example

In the example below, the total population of women of reproductive age in a target market- Brazil- is used as the "universe" which is just under 50 million women of reproductive age (15-44 years).[53] Imagining a chatbot that focuses specifically on promotion of healthy nutrition and exercise during pregnancy, the first filter could be to calculate how many women out of the 50 million are

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[53] CIA factbook 2020

pregnant at a given point in time. Based on the CDC method,[54] there are an estimated 1 million pregnant at any given point in time in Brazil.

Next, this example posits that the chatbot solution will only work for **people who access WhatsApp**. More than 90% of Brazilians send instant messages,[55] 52% are female users and reach is greatest among the age group of 15 to 44 year old Brazilians[56]. As such, for simplicity's sake, it can be said about 90% of the pregnant Brazilian cohort of women of reproductive age (at a minimum) are actively using messaging. This results in a **potential net market** of 900,000 women in Brazil.

The potential percentage of this net market that your chatbot could acquire would depend on many factors, including who pays for the use of the chatbot (WhatsApp sessions), what the marketing strategy is, what the marketing budget is, etc.

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[54]WRA = women of reproductive age (15-44 years) (CIA Factbook 2020)
b = fertility rate (births) from the most recent year for appropriate jurisdiction (World Bank)
a = abortion rate
The most recent estimates report 44 per 1,000 women in middle-income countries, and 38 per 1,000 women in low-income countries. We take the average of 41 per 1,000 in LMICs (https://www.annualreviews.org/doi/10.1146/annurev-publhealth-082619-102442)
d = fetal loss (death) rate (most recent national rate per 1,000 women)
 Estimates on miscarriage range from 10 - 20% of all pregnancies, this is the average used by WHO. We take 15%,
P = proportion of the year a woman is pregnant for each pregnancy outcome by month.
Pb: 9 months = .75
Pa: 2 months = .167
Pd: 3 months = .25
The calculation for pregnant women where all values are known is: WRA/1000 * { (B*Pb) + (A*Pa) + (D*Pd) }
[55] https://www.statista.com/topics/10063/messaging-apps-in-brazil/#topicOverview
[56] https://engage.sinch.com/blog/global-messenger-apps-usage-statistics/

EXAMPLE - BRAZIL

UNIVERSE — 48,980,221 women of reproductive age in Brazil

FILTER A — ~ 1 million pregnant women at any given point in time

FILTER B — 90% women reproductive ago IMing

~900,000 women (market potential)
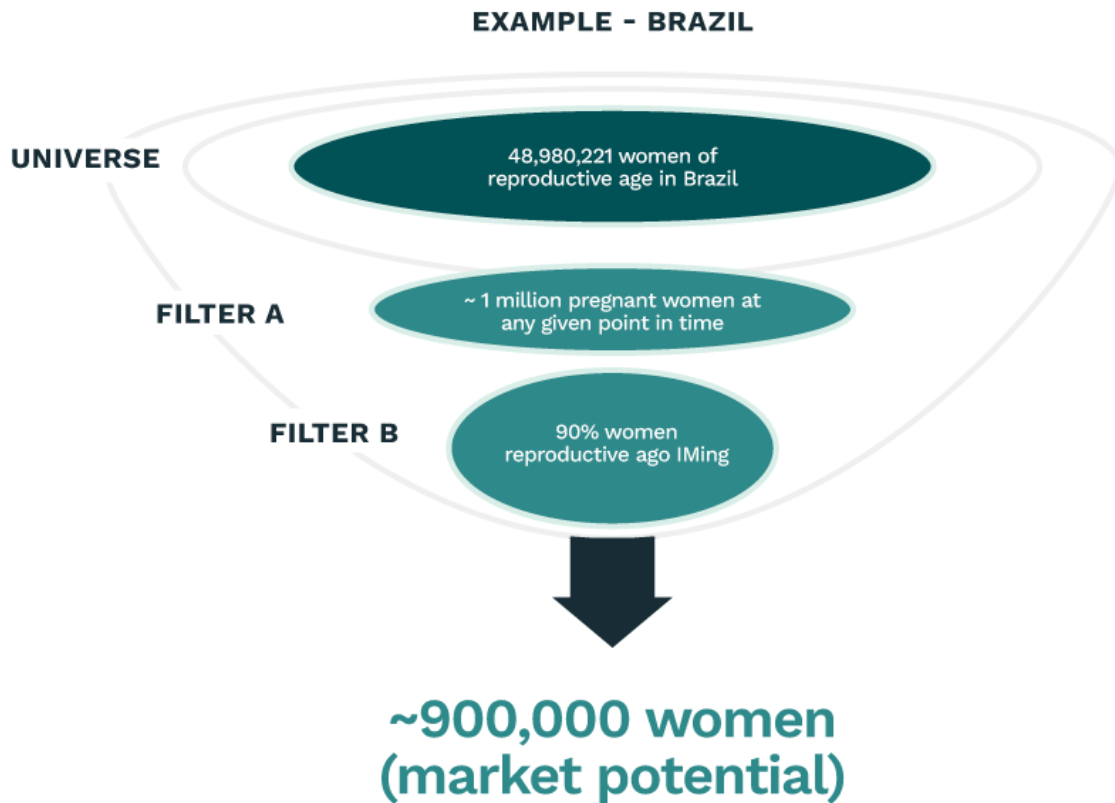
Figure 7. Market Sizing Calculation Example of Pregnant Women in Brazil

The **accuracy, preciseness and granularity** of the market sizing exercise **depends on the level of data** and research you have on what your chatbot intervention will do and who it will serve. Continuing with the example of the chatbot for pregnant women in Brazil aimed at promoting healthy nutrition and exercise during pregnancy, would the intervention target the 21% of women of reproductive age that are overweight[57]? Or perhaps target states with the highest prevalence of obesity? These factors would change both the universe figure and the filters and yield a more precise picture of the estimated net market.

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[57]https://www.tandfonline.com/doi/abs/10.1080/07399332.2019.1570516?journalCode=uhcw20#:~:text=To%20compare%20this%20increase20we,respectively%20(data%20not%20shown).

∞ Meta

[A link to the template is here](#) so you can play around with your own market sizing.

Formative Research

Formative research should be conducted pre-implementation would likely continue through the pilot phase, and iteratively thereafter to identify and/or refine key priorities for the content development, inform initial chatbot, conversational and service design, project strategies, goals and objectives, and develop indicators for an M&E framework.

METHODS - Human Centered Design

Human centered design processes, when effectively applied, can play a vital role in creating **impactful, contextually and culturally relevant** digital solutions that have a strong potential for scale, sustainability and system integration.[58] HCD, at its core, is about improving accessibility, intelligibility, usability, engagement through **co-creation.**
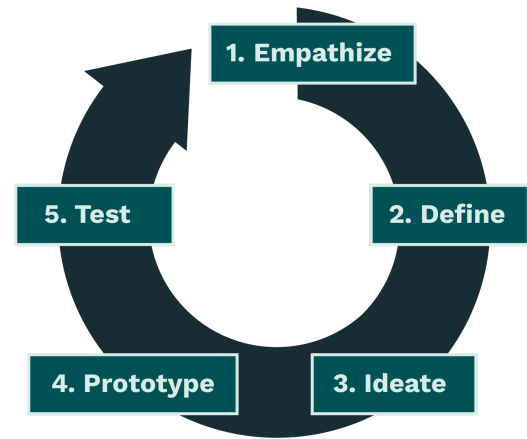
'Design with the user' is a guiding principle[59] for creating digital solutions for social impact, the idea being that digital solutions are **more likely to be effective** if the intended users are involved in the design process, thereby rooting design thinking in a human-centric approach that seeks to **understand their characteristics, needs and challenges.**

HCD speaks to the importance of **clearly defined problems**, understood and from the perspective of affected populations to help **avoid developing a**

1. Empathize
2. Define
3. Ideate
4. Prototype
5. Test

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[58] https://innovations.bmj.com/content/8/3/240
[59] https://digitalprinciples.org/

solution that does not actually address the underlying challenges.
People-centered and driven approaches which are demand, rather than
supply-driven, can help **avoid fragmentation** and **wastage** of development
resources.[60]

Stanford University defined a **five-stage process** for HCD[61]: empathize, define,
ideate, prototype and test.

➔ **Stage 1: Empathize.** A process involving: (1) observation—'view users and
their behavior in the context of their lives'; (2) engagement—'interact
with and interview users through both scheduled and short "intercept"
encounters' and (3) immersion—'experience what your user experiences'

➔ **Stage 2.** Define qualitative and quantitative data from the formative
research in stage 1 is analyzed to 'define the problem'

➔ **Stage 3.** Ideate. Based on learning from stages 1 and 2 create an
overarching theory of change for your chatbot intervention (potentially
together with other interventions) to improve outcomes among your
target users.

➔ **Stage 4**. Prototype The ideation phase of the HCD process results in the
iterative development and testing of prototypes of your chatbot
intervention.

➔ **Stage 5:** Testing Prototypes are qualitatively tested with users via
in-depth interviews to explore and assess user demand.

Research should include a **broad array of users**[62] and utilize a variety of
different **qualitative and quantitative methods** to assess a wide range of topics
such as:

● *Focus Group Discussions (FGDs):* Conducted to understand the cultural context
and the target audience's knowledge, understanding, common practices and
barriers to healthy behaviors/ health seeking behavior and practices. FDGs can
help you gather feedback on a culturally appropriate name, brand, persona and
imagery (colors) for the chatbot. During the pilot, the focus of FGDs will shift to
user acceptance testing of content and overall user satisfaction.

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[60] https://bmcproc.biomedcentral.com/articles/10.1186/s12919-018-0156-3
[61] https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process
[62] Civil society organizations, Funders, whether corporate, institutional foundations, global NGOs, or
quasi-governmental groups such as the UN, World Bank, or WHO, Foundations, such as Gates, Ford, Rockefeller, Government agencies,
Community leaders, such as locally recognized leaders who are not affiliated with the other mentioned groups, Independent
community members, such as journalists and local advocates (TechSoup)

ΟΟ Meta

- **Structured Interviews:** with potential users and their partners or and/or other household decision makers, relevant health workers and community leaders. Interviews covered topics such as barriers to services, subscriber interaction with the chatbot, user satisfaction, and assessment of various service features.

- **Initial User Engagement Data:** questions and patterns in user behavior relating to knowledge, source of information, uptake of key services and behaviors, subscriber interaction with the service, and user satisfaction.

- **Development of User Persona:** A persona is a detailed description of a fictional person (or a composite of real people) used to communicate the motivations, concerns, and interests of a user group.

- **Development of Use Case:** A use case is a story describing the actions and decisions of a user in their context - usually tied to or related to the persona.[63]

You can use these methods to explore the questions below (which would change and be adapted depending on your intended or existing chatbot use case. This Playbook uses questions for a chatbot focused on MNCH as an example).

Questions

Maternal, Newborn, Child Health

- What are the **causes** of maternal morbidity and mortality in your target geography(ies)?
    - *Direct obstetric causes (e.g. postpartum hemorrhage, preeclampsia and hypertensive disorders, pregnancy-related infections, complications of unsafe abortion)?*
    - *Indirect causes (infectious and non-communicable diseases)?*
- What are the **other determinants?**
    - *Health system failures that translate to (i) delay in seeking care and receiving care after reaching the health-care facility, (ii) poor*

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63 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6532339/

quality of care, (iii) shortages of essential medical supplies, and (iv) the poor accountability of health systems?

- _Social determinants,_ including income, access to education, race and ethnicity, that put some subpopulations at greater risk?

- _Harmful gender norms, biases and inequalities_ that result in a low prioritization of the rights of women and girls, including their right to safe, quality and affordable sexual and reproductive health services?

- _External factors_ contributing to instability and health system fragility, such as climate and humanitarian crises?

  - _Are these issues a chatbot intervention could address? How?_

- **Where** within the target geographies are health outcomes the worst for women/newborns/children (rural vs. urban areas, subnational, etc)? Why?

- What do **trends** look like over the past 10 years - what has changed and what hasn't? Why?

- What are the **key behavioral factors** related to health care seeking, including social norms and perceptions of pregnancy and birth, and factors **influencing partners' behaviors?**

- **Can program goals be achieved with "just" a chatbot** or do you need to build channels or linkages to health care systems or other pathways and partners?

Answers to these questions can help guide content selection in the content mapping phase.

Digital [64]

- What does mobile network and internet **coverage** look like in your target geography?

- Do your target users **own** and/or **use a smartphone**? If they do not own their own smartphone, **whose do they use** and **when?**

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[64] Across LMICs, women are less likely than men to have access to mobile phones and use mobile internet, in particular those who are the most underserved. As a chatbot for MNCH would primarily seek to engage women, and likely those who are underserved, it is essential to understand the barriers and enablers to digital access and usage in your target geography.

∞ Meta

- Is your target audience **aware** of mobile internet? Of **social media**?
- Do users have access to a regular supply of energy to **charge phones**? Routinely and reliably?
- Are phones **kept on or off**? When are they on?
- **How** does your target audience/ user group use (frequency, duration, purpose)
  - Smartphones?
  - The internet?
  - Social media?
- What are the **enablers and barriers** to mobile **ownership** and mobile internet **usage** for your target group[65]?
  - Age?
  - Awareness?
  - Literacy?
  - Digital skills?
  - Affordability?
  - Availability of handsets?
  - Safety and security?
    - How might a chatbot help to **overcome** or **potentially encounter or exacerbate** some of the barriers?
- How do target user(s) **use WhatsApp**?
  - To chat with friends/ family? Engage with businesses? Health care?
  - Do they use text? Voice? Both? How?
- Are users **aware of chatbots in general? For your use case**?
- Do users have any **concerns** about commonly identified barriers to using chatbots for health care[66] such as accuracy, trustworthiness, cybersecurity and privacy, perceived lack of empathy?

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[65] For women and girls, some of the most powerful barriers are poverty and illiteracy, but these disproportionately impact women and girls due to normative barriers. Age is also a key factor.
[66] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6704417/

Meta

Growth

- Is digital for social impact **prioritized at the national level** through dedicated bodies or mechanisms for governance?
- Is digital for social impact included in relevant **national strategies, plans, and budgets**?
- Is there an active **National e-Health Strategy** in place?
- Is there financing allocated for digital health?
- What are the **domestic priorities and resources** for MNCH?
- What are the **donor priorities and resources** - ODA & DAH?
- What percentage of the population is covered by **public vs. private care**?
- What is per **capita out of pocket** health expenditure?
- What is the **breakdown of expenditure** re: treatment of illness or on preventative care?
- What is the **structure of the HC system** - centralized, decentralized? Where does financing for programs happen - at what level?
- What does the **private insurance industry** look like? How many insurers are there - are they competing? Do they offer benefits/ perks to their customers?
- What is **spending per capita** on health care?
- Is there a robust ecosystem of **local language BSPs** with domain knowledge in health?

Marketing and User Acquisition

- Is your user group **digitally literate enough to 'self-enroll'** or sign themselves up? Have them try it and note what works and what doesn't.
- Does your user group click on **Facebook ads**? What for and why?
- Would users **share** this chatbot intervention? With who? Do they know how?
- For **non-digital sign-up** - what is the 'user journey' – e.g. for MNCH meaning the process that a user goes through in order to obtain services, and clinic intake processes that will relate to user registration?
- Does your user group know how to **unsubscribe?**
- What is the right text and method for the chatbot intervention to **on-board users digitally?** (explain its functionality, introduce itself, etc.)

∞ Meta

Other design questions (to be answered internally and externally)

- What are the different things **you want users to do** as they engage with the chatbot, what are the different things **they may want to do**?
- How do you address things the **users might want**, but you are **not ready to offer yet**?
- How **frequent** do you want the chatbot **touchpoints** to be?
- Do you want to introduce other **online/ offline assets** through the chatbot conversation? Do potential users follow links out of Whatsapp chatbots in your target market? Would they?
- What is the **Call to Action (CTA)**[67] for the chatbot user(s)?

Box 1. Findings from Initial UX and Content Research from Yukti Breastfeeding Chatbot in India[68]

In India, formative research on the Yukti chatbot, aimed at supporting women in breastfeeding, uncovered that factual, technical answers to new mothers' queries left them unconvinced of the content, and they sought more conversational interaction on their ideas. This led implementers to adapt chatbot content to acknowledge current practices and explain why they should be discontinued. Researchers suggested to involve ASHAs (community health workers) in the generation of this new content, as they have strong situated knowledge of the socio-cultural and socio-economic factors at play behind practices such as breastfeeding.

Another finding from this study that informed UX design was that women did not have their own phones, and had to borrow husbands' or other family members'. As such, the design considerations were to allow the bot to have a private mode or password protection to protect its content from the non-intended user and to have icons, notifications, reminders in a way that it is not "embarrassing or disturbing to the other users of the phone."

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[67] A call to action (CTA) is a prompt that tells the user to take some specified action. A call to action usually framed as a command or action phrase, such as 'Sign Up Here' or 'Buy Now' via the form of a button or hyperlink. Without a clear CTA, users may not know the next steps to take to sign up for a vaccination appointment or purchase a health commodity and are likely to leave the chatbot engagement without accomplishing their task. A call to action makes it clear to users which action to take next and helps remove friction in their health seeking, self-care (etc.) journey.
[68] https://dl.acm.org/doi/pdf/10.1145/3359272

Box 2. Drill down on data related to literacy, digital literacy, socioeconomic status, digital access and usage for your target user group.
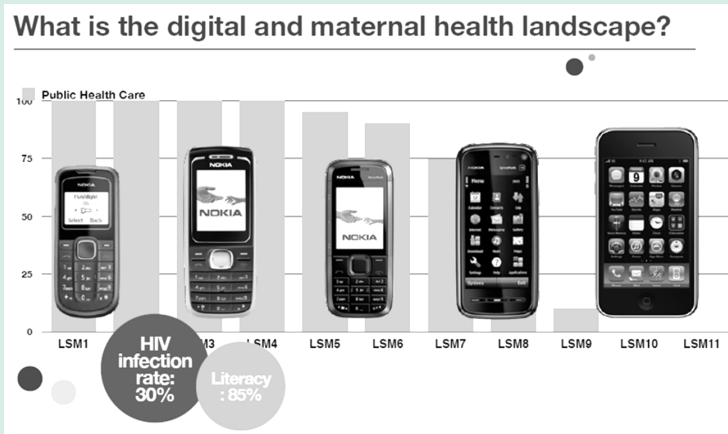
It is important in your market sizing and formative research to carefully consider and evaluate the impact of gender based inequalities, the gender digital divide, the profile of people who most socially good focused chatbots would aim to serve (e.g., marginalized, disadvantaged, low literate, low income, majority rural) and what their mobile access and usage is like in reality.

Ideally, you would map the target population's socio demographic profile, gender, and age group among other characteristics, with groups that used Whatsapp in the last month/ weeks/ etc. However, this data, especially in this level of granularity, is not readily available for most LMICs.

Even if it was, national level data and statistics often mask these inequities. For example, India currently has some 650 million smartphone users,[69] but just 26% of women own smartphones, and these are the wealthiest, most educated segments of society.

An example of how to do this research, despite challenges, is exemplified by the mobile messaging MAMA program in South Africa (now MomConnect).[70] Researchers segmented their target user group using the Living Standards Measure (LSM) marketing tool, which groups people according to their living standards using criteria such as degree of urbanization and ownership of cars and major appliances. It divides the population into 10 groups, where 10 is the highest living standard level and 1 is the lowest level. For each LSM level, MAMA SA identified the best mobile channel to reach women through a variety of mobile phone technologies that they were already comfortable with and using.

For more of the digital gender divide, please reference [GSMA's Mobile Gender Gap Report 2023](#).

What is the digital and maternal health landscape?

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[69] https://www.bbc.com/news/world-asia-india-64293857
[70] https://lib.digitalsquare.io/handle/123456789/77318

∞ Meta

Key Lessons: Market Sizing Exercise & Formative Research

❖ **A brief desk research exercise can be helpful** in identifying your potential addressable market size, exploring initial indications of need, potential reach and growth, which can then be drilled down on in the formative research.

❖ **Prioritize formative research early on** (pre-implementation) as findings help identify project strategies, define goals and objectives, set targets, and identify key social impact priorities for the content development and more.

❖ **Human centered design processes can play a vital role** in creating impactful, contextually and culturally relevant digital solutions that have a strong potential for scale, sustainability and system integration.

❖ **Your formative research will help** identify needs, barriers to and triggers of change to design a theory of change.

❖ **In your formative research be sure to look closely at the socio demographic characteristics** of the individuals with and without access to and usage of mobile internet. This should be cross referenced with data around "need."

Resources: Formative Research

➔ UNICEF Human Centered Design (reference)

➔ Pathfinder's pathway to change (tool)

➔ Feminist Design Tool (tool)

➔ Video on What is Human Centered Design (reference)

➔ 5 Principles for Making Digital Health Care More Human-Centered (guidance)

➔ Attributes to assess the quality of interaction with a (customer relationship management or CRM) chatbot (reference)

➔ Lessons learnt from applying a human-centered design process to develop one of the largest mobile health communication programmes in the world (reference)

➔ Task-based usability testing (guide)

Define your impact

Theory of Change, M&E and Learning Framework

*What is the theory of change behind the chatbot? What indicators
will you need to assess the effectiveness, monitor levers for change and impact
toward goals? How do you define scale and sustainability for the chatbot?*

Developing a **Theory of Change (ToC)** and a **Monitoring, Evaluation and Learning (MEL) Framework** are key to ensuring that the chatbot is **effective and impactful**, and makes sure you will be able to **prove this effectiveness and impact** to your partners, existing and potential donors/ payers and other users. Additionally, a MEL framework helps ensure **learnings are captured** and turned into **iterative changes** and improvements in the chatbot.

In this module you will get an overview of how to:
1) **Create a Theory of Change** for the chatbot that feeds into your MEL framework.

2) **Draft a Monitoring, Evaluation and Learning (MEL) framework.**

3) **Define key indicators** for effectiveness and impact to use in your ToC and MEL.

Theory of Change

With the support and involvement of your partners, you should develop a Theory of Change to articulate your problem statement, the areas the chatbot would address and your assumptions about how the chatbot will realize its impact.

The Theory of Change (ToC) is a management and evaluation tool supporting critical thinking in the design, implementation and evaluation of development

programs.[71] In general, developing a ToC includes an analysis of how an intervention (in this case a chatbot) could create **change in a particular area**, a description of the **pathways** through which this change is expected to happen, and a **framework for testing** whether and how change happens (see MEL framework in the section below).

Your ToC should include information about:[72]

- ☐ the **context** in which the chatbot will be implemented (social, political and environmental conditions)
- ☐ the **current state of the problem** it seeks to address
- ☐ the **actors to influence change**
- ☐ an **outcome of desired long-term change**
- ☐ a **description of process/sequence of change**
- ☐ the **underlying assumptions**

Your ToC should include various levels of change, and include the following:

- ➔ **Inputs** such as funding, technical assistance, mobile infrastructure, partners and more
- ➔ **Immediate outcomes** such as changes in knowledge, attitude, self efficacy /confidence and practice required to achieve the desired change in behavior and ultimate desired outcomes.
- ➔ **Intermediate outcomes** such as at-home preventive behaviors and seeking of health services that are measurable, relevant and within the realm of influence of chatbots.
- ➔ **Ultimate outcome**(s) sought e.g. a decrease in the percentage of women in your target user group with anemia during pregnancy and post-partum.

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[71] https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-017-0272-y
[72] https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-017-0272-y

The general theory of change developed for this playbook (below) posits that women's and families' increased access to targeted, tailored, localized health information (via a chatbot with this use case) will lead to improved knowledge, behaviors and practices, and in turn, those improvements will lead to improved health outcomes.

ECOSYSTEM THEORY OF CHANGE

Improved UX, increased engagement

Localized, appropiate content

Inputs
- Funding
- Tech assistance
- Network & mobile infrastructure (wifi or network coverage, smartphone)
- BSP WhatsApp platform or Messenger
- Country implementing partners, other stakeholders

Initial set-up
- Development of partnerships includes BSPs and governments
- Formative research Chatbot tech design
- Content development and localization
- Marketing / outreach strategy
- Business model

Patient facing chatbots
- Increased & immediate access to localized, targeted heath info
- Increased awareness of and connection to health services

→ Increase in knowledge

→ Improved healthy behaviors at the household level

→ Enhanced, self-efficacy

→ Increase in demand for care

Enhanced health service utilization

Enhanced access to health services

Reduced burden on healthcare providers

Reduced costs for patients, health system

Improved MNCH outcomes and reduction in infectious diseases

ML, Research, M&E

Potential areas to focus research & M&E framework

Figure 8. Ecosystem theory of change for a patient facing MNCH focused chatbot

Define "growth/ scale" and "sustainability" for the chatbot

WHO's MAP?S toolkit[73] defines **scaling up** as *"deliberate efforts to increase the impact of innovations successfully tested in pilot or experimental projects so as to benefit more people and to foster policy and programme development on a lasting basis."*

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[73] https://apps.who.int/iris/handle/10665/185238

Achieving scale can mean different things in different contexts, organizations and chatbot interventions.

As such, organizations should define what scaling-up or growing means for their chatbot and target market(s). Scale could mean:

→ **Reaching a certain number of end users within a target geography** e.g., an urban slum, a city, a state, or an entire country.

→ **Reaching a percentage** of a target user population e.g. 15% of pregnant women living below the poverty line in urban settings.

→ **Growth over time** in the number of end users, e.g. an increase month on month of 5% in the number of target end users.

→ **Expansion** of geo-political area, e.g. from 3 districts to 10 by end year 1.

→ **Or maybe it means multiple things,**[74] e.g., number of end users, breadth of use, and institutionalization of the chatbot.

You should also determine how you will measure this goal of scaling up, for example:

→ **Specify the quantifiable target(s)** or targets (e.g. potential users, districts, clinics, etc). This is your denominator.

→ **Specify the number of users/ clinics/ districts/ etc. you are actually reaching.** this is your numerator.

It can be challenging to correctly estimate these numbers, so try to gather as much data as possible to make this assessment, and see the market sizing exercise.

There are also **multiple ways to scale** the chatbot, for example through **replication**, where the experience is replicated for more users in more geographies, and or to scale through **diversification** whereby your organization diversifies the chatbot to offer different or new solutions.[75]

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[74] https://digital-square.squarespace.com/s/Understanding-scale-of-digital-health-tools.pdf
[75]https://dial.global/research/beyond-scale-how-to-make-your-digital-development-program-sustainable/

Meta

Think through your **"endgame"** – or the long-term approach that will be used to **scale up** and **sustain** your chatbot. The primary endgames for digital interventions are government **adoption** and **commercial adoption**, or a **hybrid** of the two.

As you define scale and sustainability for your organization, you will also want to consider the programmatic, human and technical factors required for your chatbot to function at scale, such as:[76]

→ **Human resources** required to sustain the chatbot intervention at scale (e.g. technical maintenance and updates, marketing and user acquisition support, content updates, MEL).

→ **Technical capacity** of your chatbot intervention to accommodate the increasing numbers of end users, its ability to easily adapt to necessary changes and updates, and connectivity (integration) as relevant to national and parallel systems.

→ **Financial support** to support the human resources, technical resources and more for long-term sustainable operations.

→ **How to comply with regulatory standards** and frameworks, national guidelines, data privacy laws, and strategies.

→ **Collaboration with government stakeholders and other policy makers.**

These considerations require sustainable thought and strategy, elements of what are woven throughout this playbook.

Define effectiveness and impact

Next, you will want to be sure you have **adequately defined indicators** to measure the effectiveness and impact – is the chatbot effective in what it sets out to do in terms of its **functionality** and ability to **engage users**, its **social impact**, and **cost effectiveness**?

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[76] https://link.springer.com/article/10.1186/s12992-018-0424-z

These indicators may **evolve over time**, as you learn more about how the chatbot is working in practice, as you conduct MEL and research, and as you work with partners.

Effectiveness of your intended chatbot use case & technology may include:

- **User acceptability and satisfaction**
- **Usability**
- **Stickiness**
- **User engagement**
- **Relevant/ correct cross promotion** to relevant services and products (if applicable)

Social Good Indicators *Does the chatbot impact (examples below for MNCH):*

- **Changes in knowledge, attitude, self efficacy/confidence and practice** around health topics/ issues
- **Drive demand** for care
- **Change behavior(s)** at the household level
- **Intermediate health outcomes** - vaccination adherence, medical adherence, ANC attendance, etc.
- **Health outcomes**
  - Lives saved can be derived using the Lives Saved Tool (LiST)[77]
  - Disability-adjusted life years (DALYs)[78]
  - Quality-adjusted life-year (QALY)[79]

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[77] Calculates changes in cause-specific mortality based on intervention coverage change, intervention effectiveness for that cause and the percentage of cause-specific mortality sensitive to that intervention. https://www.livessavedtool.org/

[78] DALYs for a specific cause are calculated as the sum of the years of life lost due to premature mortality (YLLs) from that cause and the years of years of healthy life lost due to disability (YLDs) for people living in states of less than good health resulting from the specific cause.
https://www.who.int/data/gho/indicator-metadata-registry/imr-details/158#:~:text=Method%20of%20estimation%3A,resulting%20from%20the%20specific%20cause.

[79] Measures the value of health outcomes. Since health is a function of length of life and quality of life, the QALY was developed as an attempt to combine the value of these attributes into a single index number. The calculation: the change in utility value induced by the treatment is multiplied by the duration of the treatment effect to provide the number of QALYs gained. QALYs can then be incorporated with medical costs to arrive at a final common denominator of cost/QALY. This parameter can be used to compare the cost-effectiveness of any treatment. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC317370/

Cost-effectiveness Indicators. *Is the chatbot intervention cost effective in terms of (examples below for MNCH)***:**

- **Cost per life saved** (compared to standard program/ intervention), per DALY or QALY compared to no intervention or standard intervention or even SMS intervention
- **Administrative cost savings** (reduced staff time in appointment scheduling, reminders, "customer support")
- Cost savings related to **correct utilization of PHC vs emergency care**
- Cost savings related to **triaging high risk cases**
- Customer acquisition cost **(CAC)** vs. customer lifetime value **(CLV)**[80]

MEL Framework

MEL[81] is a system or cycle with all three components- monitoring, evaluation, and learning, working together across all project and program phases. MEL can help collect data to **assess effectiveness** toward **impact goals**, and **monitor levers** for change.

In a nutshell MEL consists of[82]:

→ **Monitoring** –Is the chatbot working the way you planned?
→ **Evaluation** – Is the quality of the chatbot sound and is the chatbot achieving what it set out to achieve?
→ **Learning** – What can you change or do better based on new information and data?

Implementation research (related to learning, or the L in MEL) has become as important (to donors and others) as monitoring and evaluation, as findings from this research allow you to course correct, optimize and improve your chatbot intervention/ project/ program.

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[80] Customer acquisition cost (CAC) measures how you spend on customer conversion. Customer lifetime value (LTV) measures the amount you can expect to make from a single customer. Much like for tech startups, these two are critical to determine the sustainability of any chatbot intervention.
[81] https://www.resonanceglobal.com/blog/what-is-monitoring-evaluation-and-learning-mel
[82] https://www.goodpush.org/behind-the-scenes/MEL

Meta

A MEL framework[83] is composed of categories of questions that a chatbot (for social good) project/ program should address to learn and improve.

Problems & Opportunities	What are the problems that can be addressed through social impact chatbots?	**Example:** What are the barriers to exclusive breastfeeding among the target population that might be solved with chatbots?	**Success metric:** Is the chatbot project/ program assessing whether problems are being identified and addressed, generating research and evidence on problems and opportunities relevant to NGOs, governments, etc. and affected populations?
Potential Solutions	What are the viable chatbots for your social good purpose that can scale in your intended market(s)?	**Example:** Chatbot that provides targeted, tailored, localized health information on breastfeeding via images and videos, + offline component of program is health care worker training on the same content.	**Success metric:** Is the chatbot program/ project identifying high-quality interrelated solutions? What holistic set of solutions (chatbot + ?) that can address the identified problems?
Drivers and Challenges	What drivers and challenges determine whether chatbots can be successfully implemented & achieve scale?	**Example:** Trust and acceptance of chatbots, digital literacy and smartphone access by pregnant and lactating women and household decision makers in target market(s).	**Success metric:** Are barriers to leveraging a chatbot for the problem, and barriers to implementation and scale accounted for and overcome?
Ecosystem investments and interventions	What interventions overcome those challenges?	**Example:** Advocacy for privacy policies for sexual, reproductive health data.	**Success metric:** How effectively are systemic barriers to chatbot access/ usage being addressed?

Figure 9. <u>MEL Framework Example</u> Based on GSMA's Humanitarian Settings Model

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[83] This graph is adapted from GSMA's MEL framework for humanitarian settings.
https://www.gsma.com/mobilefordevelopment/resources/a-monitoring-evaluation-and-learning-mel-framework-for-humanitarian-innovation-programmes/

Meta

The framework can be put into practice using three types of tools:

1. **Numerical trackers** for monitoring of numerical data on outcomes and processes which are shared with donors and others, while also providing simple tools for teams such as dashboards of key indicators (e.g. bot logs to track take-up and usage).

2. **Qualitative data collection tools** gather feedback data from your users to generate evidence to validate or explore assumptions in your ToC and program outcomes. (e.g. a survey within the chatbot itself)

3. **Qualitative reflection tools** for internal learning and information sharing which document lessons learned.

Data from these tools feeds into a variety of different outputs and to inform **daily decision making, enable iteration**, and **generate evidence** for users. It is essential to create and implement a MEL framework and plan that informs partners and users at each step the chatbot user journey if the chatbot is reaching its target audience and having the intended effect(s). You will want to set your own specific goals for reach, engagement, knowledge, behavior, practices and/or service utilization depending on context.

Lessons Learned Define your Impact

❖ **Developing a Theory of Change (ToC) and a Monitoring, Evaluation and Learning (MEL) framework are key** to ensuring that the chatbot is effective and impactful, and that you can prove it.

❖ **A MEL framework helps ensure learnings are captured** and turned into iterative changes and improvements in the chatbot.

❖ ** It is essential to create and implement a MEL framework and plan that informs partners and users at each step** the chatbot user journey if the chatbot is reaching its target audience and having the intended effect(s)

❖ **Achieving scale can mean different things in different contexts**, for different organizations and different chatbot interventions. As such, organizations should define what scaling-up or growing means for their own chatbot and target market(s).

❖ **Be sure to clearly define indicators that assess if your intervention is effective** in what it sets out to do in terms of its functionality and ability to engage users, the social impact of the intervention, and if it is cost effective.

Resources Define your impact

➔ For MEL GSMA Monitoring Evaluation and Learning (MEL) Framework for Humanitarian Innovation Programmes

➔ For research agenda Future directions for chatbot research: an interdisciplinary research agenda

➔ For ToC Using Theories of Change to inform implementation of health systems research and innovation: experiences of Future Health Systems consortium partners in Bangladesh, India and Uganda

➔ For sustainability definitions and strategy Beyond Scale: How to Make Your Digital Development Program Sustainable

➔ For scale and sustainability definitions and tools WHO's MAPS Toolkit

Plan & Strategize

Business Model & Plan, Marketing Strategy, and Partnerships

What are the cost drivers and requisite resources to develop, implement, grow or scale the chatbot? What are the considerations in engaging with them? Who could fund your chatbot at the various levels of growth/ scale? What is the related research agenda you may need to implement to make the social good case and/or the economic case to these potential donors or payors?

Building, launching, implementing and scaling a chatbot can be **costly**, and many organizations struggle to both **identify** and **budget for costs** as well as secure **funding**.

This section can help you think through selecting a business model, creating a business plan, drafting a marketing strategy, and identifies the partnerships required to bring these to fruition.

➔ **Business Model** - how to select an appropriate model(s) based on your chatbot type, use case, market, organizational/ partners capabilities and more.

➔ **Business Plan** - how to detail out capital investment, recurring costs, including cost of acquisition and retention at different levels/slabs of use e.g. cost per acquisition perspective.

➔ **Marketing strategy -** how will you identify, reach, target, market to, acquire and on-board your end users?

➔ **Identify partnerships -** which partnerships are required to realize your business plan, marketing strategy, and more?

∞ Meta

Business Model & Plan

Business Model

Successfully launching a business model for the chatbot requires **careful planning** and **foresight**. Your business model should reflect the context in which you operate, incorporate user needs and preferences, comply with government regulations and relevant existing infrastructure.

There are many different types of business models you can consider to utilize to secure funds for the chatbot at **various stages of growth** - from its development to pilot phase, as it is implemented and at scale. Depending on what your chatbot does, team capabilities and more these business models range substantially as do the types of payors or donors you'd target.

We provide an overview of some of the various business models for digital solutions for social good, with MNCH as the example in the google sheet below, together with key considerations for each.

➔ **Here is a link to a list of Potential Business Models for MNCH**

Business Plan

A business plan is a tool you may use to convince people that working with you — or financially supporting your work — is an effective and impactful choice to realize social good.

A business plan[84] is like a **roadmap** for how to structure, run, and grow your chatbot program. Business plans can help you **get funding** or bring on **key partners**.

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[84] https://www.sba.gov/business-guide/plan-your-business/write-your-business-plan

∞ Meta

While you are most likely not running a business, many elements of a traditional business plan apply to how you will **approach donors or payors in the social good space**. Thankfully you have probably already done a lot of the legwork - either on your own or in other modules of this playbook!

Key elements of a business plan

→ **Executive Summary:** *In brief what is your chatbot and related project or program, why will it be effective and impactful, basic information about costs, and high-level plans for scale and sustainability if you plan to ask for financing.*

→ **Organization & Partnership Description:** *How is your organization - and partners - uniquely suited to solve the problem, with this method (a chatbot) for these specific users? Be specific about how you have a deep understanding of the problem, the users and the markets. Describe why your expertise, skill sets, earned trust of the user group, unique insights, experience and more make your organization and/ or partnerships well positioned to succeed in your goals.*

→ **Market Analysis:**

Demonstrate a strong understanding of your target market, related digital ecosystem factors, and your social good area. Use your robust formative research to show you are aware of what others have tried to do to solve this social good problem and why your solution is the right solution. (See Module 1. [Analyze)](#)

→ **Organization & Management:** *How are your operations managed - what are the various partner roles and responsibilities now and as your chatbot scales? How is the work governed? How are the partnerships organized?*

→ **The Service (Chatbot)** *Get detailed about the chatbot, including how specifically will it engage and benefit your users? How will it (together and with other programmatic elements) solve the problem? Describe plans for pilot and effectiveness testing, MEL, most robust research. (See [Chatbot Use Cases](#), [Formative Research](#), [Types of chatbots](#), [Define your impact](#))*

→ **Marketing:** *What is your plan to market to, acquire and scale users of your chatbot? (See [Market Sizing Exercise](#), [Marketing Strategy](#), [Define your impact](#))*

→ **Funding Request:** *What are your funding needs? Explain how much funding you'll need for what timeframe and what you'll use it for. Include a description of your future sustainability plans - e.g. government adoption, commercial partnerships or a hybrid model. (See [Funding needs and financial projects](#)*

considerations, *Define your impact*, *Potential Business Models for Chatbots for Social Impact*)

→ **Financial projections:** *Provide a prospective financial outlook for the next five years. For the first year, you can be even more specific and use quarterly — or even monthly — projections. You will want to make sure you can clearly explain your projections, and match them to your funding requests. (Sample chatbot budget)*

Cost considerations

If you are not yet implementing your chatbot, you will want to **make estimates** of potential/ projected costs. If your chatbot intervention is underway in its implementation, you can **use existing tracked costs** based on financial records.

You can then **categorize costs** into **capital** and **recurrent costs** (see below) for the core activities which comprise the development, implementation and growth/ scale up of the chatbot.

The costs of developing, implementing and scaling a chatbot will vary based on the market(s), type of chatbot and chatbot use case. The costs of chatbots are largely based on:

- **Conversation costs:** (see more here).
- **Marketing and promoting your chatbot solution:** (see more here)
- **Chatbot type and use case**, for example:
  - How simple vs. complex/ customized is your chatbot?
  - What are the functionalities you will either need to build or pay for?
  - Will you use text only, or voice?
  - Will you leverage AI? How?
- **Who will build your chatbot?**
  - Will you buy a subscription from a chatbot vendor?
  - Get a pay-as-you-go chatbot?
  - Build it in house, and maybe need to hire a developer?
    - If you decide to develop a chatbot in-house rather than rely on an external platform, the costs may be higher initially. Costs could

include hiring a developer (salary), graphic designer (salary) and additional costs for integrations.

- **Integration:** allows bots to take advantage of third party solutions to do different tasks (like integration of data analysis for machine learning). For example, a chatbot that collects feedback on health services will likely need to integrate with health information management systems (HIS) in the country it operates in to share data.

1. Capital Costs - one-time costs associated with[85]

a) Infrastructure (third-party software, hosting infrastructure, e.g. chatbot building platform)
b) Technology fees and step-up costs (e.g. initial software licensing fees, API or other integration setup costs)
c) Content creation
   i) Internal and external support to research, build, user test, localize, translate, approve content for the chatbot

2. Recurrent costs - on-going costs associated with

d) Hosting costs
e) Subscription fees (monthly, annual, etc.) for the software
   i) Monthly fee for using the WhatsApp Business Platform
f) Messaging/ WA conversation costs
   i) (>1m/ month and <1m/month) see WhatsApp Pricing for Health below*
g) Data center - data science capabilities and support
h) Human support -call center for chatbot users, if you offer a connection to this kind of semi-automated element
i) Tech maintenance & updates
j) Staff/ Personnel

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[85] *Note - The cost of going to market with minimal viable product (MVP) to establish the relevance of a chatbot should be considered separately from the total cost of ownership over a period of time.*

∞ Meta

k) Customer acquisition costs - training costs/ payments to community health workers or last mile entrepreneurs if you use these, marketing and promotional materials (digital and non-digital)

l) Office space and other miscellaneous costs.

Sample Chatbot Budget

Below is a simple template you can use to budget chatbot costs over time. The excel sheet lists categories of costs in line with those listed above with more detail but does not offer formulas or prices ranges as these are highly contextualized.

➜   **Sample Chatbot Budget Template**

Chatbots run by non-profits or governments which fall within the current social good verticals at WhatsApp - health, elections, and humanitarian emergencies, may be subject to a special pricing structure where up to 1 million conversations (messages sent within 24 hours) per month are free.

Once you reach beyond 1 million conversations per month, you will be charged per 24-hour conversation, with different rates by conversation category: utility, authentication and marketing. More details on how the WhatsApp Business Platform pricing works can be found **here**.

Pitch Template

The Donor/ Payor Pitch Template (Figure 10 below) lays out how to pull together- **key elements** from previous sections from this Playbook, in particular Defining your Impact and Potential Business Models for Chatbots.

Underpinning your ability to **articulate** and make your social good and economic cases (e.g. that your chatbot is more cost effective or efficient than alternatives or standard practice) is your Theory of Change. You will test the assumptions and hypotheses laid out in your ToC via your monitoring, evaluation, learning and research agenda which will evolve as your chatbot scales.

SOCIAL GOOD CASE

Make the social good case.
You will begin with your theory of change or hypothesis, and then work via MEL to test this as your chatbot intervention scales

RESEARCH M&E AGENDA

Acceptability, feasibility, UX incl engagement | Self-reported improvements in knowledge, attitudes, behaviors | Cost effectiveness | Social good outcomes

DONORS

LAUNCH

5,000 users | 100,000 users | 1 million users

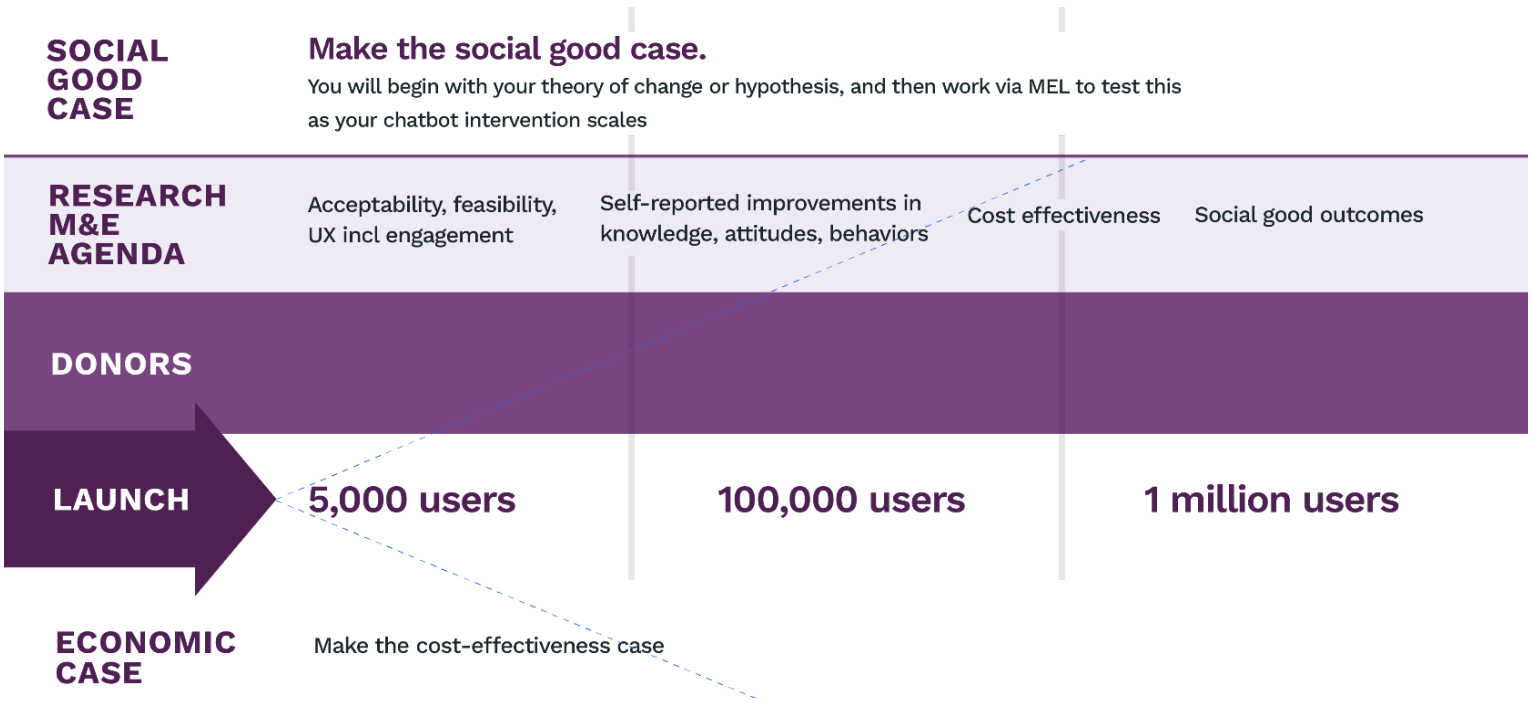**ECONOMIC CASE**

Make the cost-effectiveness case

Figure 10. Donor/ Payor Pitch Template

The completed template below uses the **example of a chatbot for maternal health in Brazil** that promotes healthy behaviors during pregnancy to reduce non-communicable diseases (NCDs), lower unhealthy gestational weight gain and, reduce gestational diabetes, and increase early childhood vaccinations.

PUBLIC HEALTH CASE

Poor diet and exercise in pregnancy can = excessive GWG & onset of gest diabetes w costly short- and long-term outcomes for pregnant women and infants (increased risk of pre-term delivery, larger than average newborns, increased risk in early childhood obesity.) Obesity = significant burden on HS. Reduction in obesity in pregnant women and infants = reduction in NCDs.

Earlier identification of warning signs by women and connection to HS = intervention in high-risk cases, less intervention in cases where not needed = reduction in maternal & infant mortality & morbidity.

Reduced workload for HCWers and administrators (another challenge to be faced by the new Lula admin is human resources in the health workforce.)

Improved compliance of patients to complete vaccination schedule, uptake in childhood vaccinations = reduction in infection disease

RESEARCH M&E AGENDA	Acceptability, feasibility, UX incl engagement	Self-reported improvements in knowledge, attitudes, behaviors	Cost effectiveness (GWG, PHC, Vax uptake) on QALYs, DALYs, ICER	Intermediate health indicators (e.g. 6 ANC visits) MNCH outcomes (GWG) Vax uptake
DONORS	Meta (conversation costs), private sector hospitals, local foundations	Health Insurance Companies (4 major), Municipal Health Secretaries, Pharma (J&J, Unilever, Sanofi, GSK), National Immunization Program (PNI), BMGF, USAID, CIFF, Meta (convo costs)		SUS (Unified Health System)/ National ministry of health, Health Insurance Companies, PNI
LAUNCH	5,000 users	100,000 users		1 million users

ECONOMIC CASE

- Women with elevated BMI have health service usage and costs during pregnancy increased by 23% and 37%, respectively, and whose children also incur higher health care costs over their first 18 years of life.** Normal BMI pregnancy HC costs are lower.
- More patients use PHC vs hospitals & specialists = reduced costs for patients, health system (SUS), private providers and insurers
- Better data on quality and access to care for MNCH & immunization, enhanced demographic data = insights for more targeted and effective health care spending.
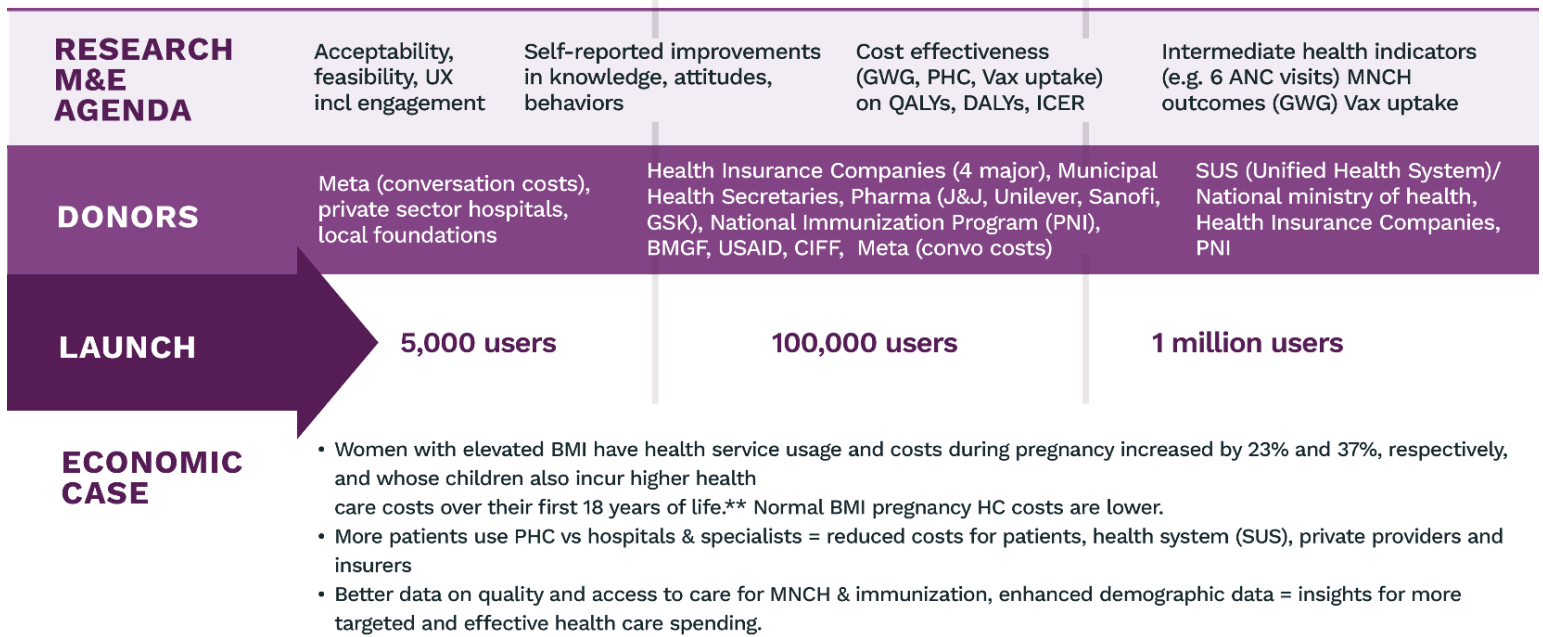
Figure 11. Example Donor/ Payor Pitch Template Example MNCH/ NCD focused App for Brazil

You will want to **tailor this template** to your definitions of growth/ scale, impact and effectiveness and of course to your chatbot type, use case and market.

Related Research Inspiration

Here are some great examples of how cost-effectiveness has been measured in digital messaging interventions to use for inspiration for your own research, or to build the case to potential donors or payors before you have your own results:

★ **The national maternal messaging program *Kilkari* in India**[86] was found to be highly cost-effective.

★ **Social media advertisements fun on Facebook and Instagram aimed at increasing Covid-19 vaccination rates[87] were found to be** an effective medium for changing important self-reported beliefs and attitudes around COVID-19, and were a cost-effective approach to increasing rates.

★ **A cost effectiveness study[88] on mCARE digital health interventions in Bangladesh** found digital health strategies like SMS and home visit reminders on a well-established pregnancy surveillance system may improve service utilization and program cost-effectiveness in low-resource settings.

★ **A cost-effectiveness analysis of SMS text messages on maternal health information[89] in South Africa** suggests that delivering text messages to pregnant and postpartum women may be a cost-effective strategy for bolstering antenatal care and childhood immunizations, even at very small margins of coverage increases.

★ **A cost-effectiveness analysis[90] from the perspective of the public health system in Ireland,** suggests that a mobile-health lifestyle intervention for pregnant women with an elevated body mass index could be cost-effective.

Lessons Learned: Laying the Foundation for Impactful Growth

→ **There are many business models you can consider** to secure funds for the chatbot at various stages of growth - from development to pilot phase, as it is implemented and at scale.

→ **Business models range substantially depending on what the chatbot does, team capabilities and more**, as do the types of payors or donors you might target with them.

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[86] https://gh.bmj.com/content/6/Suppl_5/e009553.full
[87] https://www.pnas.org/doi/10.1073/pnas.2208110120
[88] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0223004
[89] https://mhealth.jmir.org/2018/7/e153
[90] https://arrow.tudublin.ie/cgi/viewcontent.cgi?article=1303&context=scschbioart

➔ **Lack of research on cost effectiveness limits the sustainability of digital health projects**, so prioritize creation of a theory of change and MEL framework early on and link indicators and findings to how you pitch to payors and donors.

➔ **The biggest cost related to chatbots is the cost of the conversations**[91]. After conversation costs, costs are largely based on: marketing and promotion, chatbot type, use case, who will build the chatbot, and integration. Prioritize which of these are worth it to bring about the desired social impact change.

➔ **Recurrent costs at scale are more significant than set up costs**, so plan ahead and budget for capital and recurrent costs for the core activities which comprise the development, implementation and growth/scale of the chatbot.

Resources: Laying the Foundation for Impactful Growth

➔ The Business Model Sustainability (BMS) Toolkit helps social enterprises, NGOs, and small businesses think about their sustainability and the sustainability of their digital solutions. It consists of a **Business Model Sustainability Canvas** and a **Business Model Sustainability Guide**, which includes guidance, case studies, and interactive tools for users.

➔ DIAL Sustainability Toolkit

➔ WHO MAPS toolkit

➔ US Small Business Administration Write Your Business Plan

➔ Meta - Updates to Conversation Based Pricing

➔ DIAL How to Calculate the Lifetime Costs of Software Enterprise Solutions

Marketing Strategy

Developing strategies to effectively and efficiently market to, acquire, and grow the number of chatbot users is hard, iterative, but critical work.

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[91] WhatsApp charges per conversation, not per individual message. Conversations are 24-hour message threads between you and your end users. For more, see https://developers.facebook.com/docs/whatsapp/pricing/

In the first half of this module there are considerations, tips and tricks for **marketing the chatbot** and an outline of **various channels** to explore - both **digitally** and **non-digitally**- to acquire users.

To begin planning how to market the chatbot and acquire or reach the target number of users at each stage of the project or program, organizations should **clearly identify the user segments** they intend to reach.

Much of this will be completed in the [market sizing](#) and [formative research](#) where you would work to **define key characteristics** of users segments[92] for the chatbot which would include at a minimum sex, age, location, socioeconomic status, mobile/ social media/ messaging/ internet adoption and consumption patterns.

One of the key characteristics you want to hone in on is what **communication channels** your users utilize - socially, to purchase products, to access information and more. Particular user segments favor certain communication channels over others. Targeting users through channels they already access may help ensure marketing materials are seen by the right audiences and are therefore more efficient.

Then, depending on your social good focus, you could include additional characteristics to explore among your user segments. For example for a chatbot focused on health these may include current health seeking behaviors, health decision making influencers, and penetration of health services in various communities.

A **marketing and user acquisition plan** should also take into consideration questions such as:

→ **How will customer segments become aware of the chatbot?** (the chart below outlines options)

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[92] Some research suggests that this level of segmentation may not be sufficient to truly understand user groups and challenges the assumption that populations residing in major cities have relatively homogenous attitudes and behavioral profiles. For example, a study in India found significant variation in lifestyle and perceptions within the same urban area and socioeconomic groups, and therefore suggest that marketing strategies account for this heterogeneity in attitudes. You and your team will want to decide how detailed to get depending on your resources, time, access to user groups and planned chatbot intervention use case.

➔ **What do users need to know** about the chatbot and **how will this be communicated?** (see tips below)

➔ **What does on-boarding/ sign up look like?** (see below). Will users need assistance? How will you ensure users know how to and can opt-in?[93] What type of information do you need to collect when users are signed up (either digitally or not digitally)?

➔ **How much will all this cost** and can it be delivered and sustained at scale?

➔ **Who might you be leaving out?** Who *can't* access your marketing materials or user acquisition channels? If your chatbot will offer services to a wide range of individuals or is intended to support marginalized/ underserved groups carefully consider how to ensure you are not excluding these groups.

➔ **What is your target reach?** (number of users, percentage of a population, etc.) - this is key for determining how to finance the chatbot over time.

How can you work to ensure potential users are aware of the chatbot and convince them to get started? Here are a few tips.

What's in a name?

- Give the chatbot **a memorable, compelling and indicative name**. Products or services usually have names which affect how customers think about and engage with them.

- The name of your chatbot (ideally developed through human centered development) may impact how users perceive its value and associate it with its function. A snappy name can also help them **remember it easily**.

- You will also want to come up with a **logo related to the chatbot name** for use in marketing materials and in the intervention itself.

Never forget a face.

- Think about how you could **leverage the chatbot persona** if you have one to market the chatbot. The chatbot's avatar could be an image of a real person, or an illustration.

- When users get used to the "face" and the name of the chatbot persona they may **associate it with the chatbot** instantly (it can help with the chatbot name recognition, too) and it can be used further online and offline for promoting the chatbot.

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[93] You can only get in touch with people on the WhatsApp API if they've agreed to be contacted by you on this platform. users must opt-in for your service. You must always respect users' requests for discontinuing or opting out of your WhatsApp chat service (on or off WhatsApp).

Meta

- The **tone of voice** the chatbot uses is a key element of its persona, and **should match the brand** image (logo, colors, name). It can be professional, funny, kind, warm, kind. Give potential users a taste of this tone in your marketing materials.

When it comes to the chatbot's value add, spell-it or draw-it out.

- Leveraging the right name and a persona for the chatbot may result in potential users having an increased likelihood to sign-up, as they will have a **clearer picture of the value add** of the chatbot intervention or product, but don't assume that is enough!
- Make sure your marketing materials succinctly and clearly communicate **what service your chatbot provides to users** - what does it do? How? Why? How is this different/ better than the status quo?
- If marketing to a less literate and technically literate group - how can you **simplify** what the chatbot does in layman's terms? With **visual** aids?

Let your users spread the word.

- Get your users to market the service! Whatsapp went viral by leveraging users as marketers. Create an opportunity and **make it easy for users** to share their experience and invite their communities to use the chatbot.

Facilitate easy follow-through.

- Make sure branding materials clearly and easily communicate (even demonstrate) how to **sign-up in simple steps**.
- For example, the chatbot name, avatar and a QR code with CTA (call to action) could be printed and located next to a product on the shelf in the store related to MNCH or in a health clinic, to direct customers to more info, instruction, inquiry form, or other action.
- **Point to a human resource** (call center, helpline, clinic location, etc.) if needed/ offered for additional help signing up.

Give the chatbot a home.

- Consider establishing a **dedicated landing page** (website, Facebook, and/or Instagram, etc) for the chatbot to allow potential users to find it through search engines. Marketing materials can have a link to this page which can have additional information and support including on how to get started.

- Make sure this **"home" aligns with the branding and persona** of the chatbot and other marketing materials.

Table 1. Overview of User Acquisition and Marketing Channels for Social Impact Chatbots

Method	Name	Description	Considerations
Digital	**Links from Facebook Ads**[94]	Facebook ads - targeted or untargeted- provide a link to the chatbot service.	Users cannot link directly to WhatsApp from a Facebook ad, this is a more involved process and requires users to initiate first contact with the chatbot.
Digital	**Publishing posts, stories about chatbot on Facebook, Instagram**	Published posts and stories about the chatbot can provide an overview of what the chatbot does/ its unique value and provide a shared link to the chatbot.	Who will posts come from? Your organization? A health authority? An influencer? Consider sources that are already in contact with the user group but that are trusted sources of information.
Hybrid	**Word of mouth**	Users share information about the chatbot with other potential users - either in person or digitally	Make sharing easier: tell users how to use wa.me links. Pick a chatbot name that is easy to remember for sharing, etc.
Digital	**"Click to chat" or "wa.me" links**	With "click to chat" functionality, WhatsApp allows a user to begin a chat with someone (for example your organization) without having the number saved in their phone's address book.	Many users share content, resources, links over WA, so chatbot content if applicable with the use case could enable that.
Digital	**Pop-ups on websites**	A pop-up on a website can encourage users to use the chatbot, together with a click-to-chat or QR code.	A homepage is the first place many people go when they have an inquiry or want to find out information. Think about which website to leverage based on the user group - where do users already go to seek health information and services online?
Hybrid	**QR codes**	QR codes printed on posters, leaflets and other marketing material or QR codes on digital marketing channels.	Some users might not have a QR code reader installed on their phones. Who promotes/ shares the QR code? Do users know what to do with a QR code - are they digitally literate enough?

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[94] https://www.facebook.com/business/help/199357208512411

Non-digital	Health workers (in clinics)	Health workers spread the word about the chatbot to existing patients, provide them with informational materials and can help with getting started with on-boarding / sign-up with the chatbot.	Does a significant enough portion of your target user group go to health clinics already? Who are you leaving out if you focus primarily on this method of outreach? Cost- will you need to pay health workers? What will the related training time and resources be?
Non-digital MNCH example	Community Health Workers (CHWs)	Community health workers spread the word about the chatbot to existing patients and their households (if they make home visits) to provide them with informational materials and can help with getting started with on-boarding/ sign-up with the chatbot	Are CHWs prevalent in the locations you plan to target? Are they trusted and respected by the user segment(s)? Cost - will you need to pay CHWs? What will the related training time and resources be? Will you need to get government permission to engage CHWs in this work? Will time spent doing this work take them away from other vital work in the health facility? What are the costs and considerations related to that?
Non-digital MNCH example	Last Mile Entrepreneurs (LMEs)	LMEs are entrepreneurs that go door to door selling health commodities. They can spread the word about the chatbot to their customers to provide them with informational materials and can help users get started with on-boarding/ sign-up with the chatbot	Are LMEs prevalent in the locations you plan to target? Are they trusted and respected by the user segment(s)? Cost - will you need to pay LMEs? What will the related training time and resources be?
Digital or non-digital	Influencer promotion	'influencers' can reach a wide audience who are likely to carefully consider the advice or information provided to them and act upon it.	Is there an influencer - social media or celebrity your user segment(s) follow? If so will you need to pay them for promotion or could they do this as a volunteer? Keep in mind the influencer could also be a representative from a local community group, local institution, government rep and the method of delivery could be in-person - at an event.

Non-digital methods

Digital marketing may only reach those who are **already online**, rather than those who are **most in need**.

This, combined with the fact that there may be a general **lack of familiarity** and understanding of chatbots amongst your users, means it may be necessary to **leverage non-digital user acquisition methods** and **marketing approaches**. Uncertainties around the trustworthiness, accuracy of the information and sources behind the chatbot service have been identified as areas of concern

among users in relevant research. Additionally, users **may not be able to understand** or feel apprehensive in navigating the technological complexity of chatbot.[95]

User acquisition and marketing strategies can **address and assuage these concerns** by being clear, transparent and informative around what the chatbot is, what it can do and not do, who has developed it, and more.. Additionally, a **light informational training** on how to use the chatbot may be paired with in-person enrollment/ acquisition to familiarize users with the basic features and functionality.

Depending on your customer segmentation findings, you may want to **enroll users via an in person setting**, for example if the chatbot focused on MNCH you could leverage health facilities when women go for antenatal care. Or, you may use a **combination of approaches** to enroll users including community agents, facility-based workers and self enrollment. Key elements to ensure reliable registration and inclusion of hard-to-reach users could entail leveraging a **mix of partners**, such as NGOs with field staff and recruitment of chatbot specific promotional agents.

For example, for MNCH focused chatbots, it may be worth considering working with organizations that have a large network of existing **Community Health Workers** (CHWs)[96] as these partners can add **trust and credibility** to a new service.

However, it's important to consider what other responsibilities and challenges may come with working with CHWs – for example **training them** on the chatbot will take time and resources, and time that they then spend on-boarding users and helping them get started with the chatbot may take time away from treating other patients or other tasks.

Another group to consider deploying for non-digital user enrollment are **last-mile entrepreneurs**, such as **Living Goods**.[97] One of the benefits of working with this group is they may have somewhat smaller catchment areas than that of a typical CHW, and thus they have more familiarity with the community.

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[95] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6704417/
[96]However, you will usually need government permission to put technology in the hands of CHWs, even for a pilot
[97] https://livinggoods.org/what-we-do/the-living-goods-approach/

Additionally, unlike CHWs, they are entrepreneurs seasoned at creating, managing and closing sales prospects.

Box 4. Examples of Marketing from Digital Health Programs

★ The **mobile messaging for maternal, newborn, child health program in Bangladesh** called Aponjon used last mile entrepreneurs called Infoladies as a dedicated sales team, which an approach that was found to have many advantages over using community health workers – lower cost of customer acquisition, higher rates of customer referrals in their communities, and better control over their performance.

★ In **India the *Kilkari* program** which delivers stage-based, time-sensitive, weekly audio information directly to families' phones to reinforce health worker counseling, found that face-to-face marketing was necessary to reach low literate pregnant and postpartum women and their families in low-income, rural communities. Digital marketing and marketing through the mobile network operator top-up shops primarily reached young men who were unmarried or not interested.[98]

Working with CHWs and last mile entrepreneurs **may have significant cost** and human resource requirements that should be taken into consideration as chatbots are deployed and scale. One way around training requirements is to employ a **train-the trainer model** to train the NGO, clinic or other staff to carry out subsequent refresher training, and to imbed/ link them with other routine staff training.

Offline marketing can be very expensive at scale. As such, **partnerships are key** - either with the government to market as part of its existing health promotions or partnerships with fast-moving consumer goods (FMCGs.)

For example, to identify and subscribe end users at scale, the *Kilkari* program was integrated with government databases that track pregnancies and births in India, enabling automated subscription of millions of new and expecting mothers with no investment in marketing.

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[98] https://gh.bmj.com/content/6/Suppl_5/e005341

On-boarding

A **user onboarding** is a way of helping new users to successfully adopt a new product.

To **address difficulties** related to users' potential **lack of knowledge** on how to communicate with the chatbot (including issues with **literacy, digital literacy**) a user onboarding should be implemented if possible.

The **chatbot itself could do this** by sending a welcome message that tells your users what it is for, providing a clear explanation or demo of how it can help or how to talk to it. This can create a more inclusive and welcoming interface for all users regardless of their previous knowledge of similar technology.

The on-boarding should also clearly state what the chatbot is not intended to do - e.g. it is not intended to replace a medical professional, or to self-diagnose.

On-boarding should also clearly inform users about **how their data will be used**, cover data privacy policies, how to opt out and in. You should include informed consent language in your formative research/ user testing to make sure this is written/ communicated as clearly as possible to end users in a way that they can understand thus actually consent to.

★ ***Example:*** *Interaction with the Yukti breastfeeding chatbot in India was the first time users were exposed to a chatbot. As such, developers included animated videos depicting how a mother can interact with Yukti to help with any on-boarding confusion.*[99]

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[99] https://dl.acm.org/doi/pdf/10.1145/3359272

∞ Meta

Key Lessons Learned: Marketing Strategy

❖ **In marketing the chatbot, consider how the persona, name and logo can be used** to make the chatbot more memorable and recognizable.

❖ **Offline marketing can be very expensive at scale**. As such, partnerships are key - either with the government to market as part of existing health promotion or partnerships with fast-moving consumer goods companies.

❖ **Digital marketing and user acquisition may be more cost effective, but carefully test these methods** to determine if users are digitally literate and digitally connected enough to navigate and utilize.

❖ **User onboarding is essential** to make sure users understand how to use the chatbot, what it is and isn't capable of, how to opt in and out, and how their data will be used.

❖ **The chatbot needs to have a privacy policy** aligned with privacy and data protection legislation in the country, or if there is no legislation, then ideally with privacy and data protection best practices (e.g., GDPR).

Resources: Marketing Strategy

➔ GSMA Connected Society Mobile Internet Skills Training Toolkit A guide for training people in basic mobile internet skills (could be helpful for in person on-boarding and introduction to bot)

➔ turn.io "Three rules of engagement"

➔ turn.io "Great ways of marketing your chat service"

➔ turn.io "Use a wa.me link to market your service"

➔ turn.io "Get user consent in WhatsApp conversation"

➔ turn.io "Use automation to collect opt-in"

Meta

Partnerships

Why do partnerships matter? What are partnerships best practices for digital development interventions such as chatbots? What are the partner roles and types required to successfully develop, implement, scale and sustain chatbots for social good? What does each bring to the table - at each phase?

Digital development projects are stronger when the right partners across sectors come together. While one organization may have or be able to buy in the expertise to undertake much of the work alone, this is not generally recommended because it takes many invested stakeholders for digital development to ensure sustainability digital development implementations at scale.

Partnering with the right organizations for a chatbot is important because partnerships can:

➔ **Achieve more** mutually beneficial outcomes, as well as the overall social impact outcome goal(s).

➔ **Increase effectiveness** as collective strengths, skills, networks and more are leveraged.

➔ **Make the most of limited funding** by:
 ◆ Pooling resources.
 ◆ Applying for funding together.
 ◆ As different donors or funders tend to be interested in funding different phases of the digital project lifecycle, leveraging them in different ways along the project lifecycle may be helpful to bridge the implementation and financing gaps.

➔ **Help avoid duplicative, siloed interventions and pilotitis, prevent fragmentation and lack of interoperability** – partners can work to ensure that digital tools and systems work together, if need be and/or complement one another.

Cultivating partnerships, maintaining them, coordinating across them and bringing them together to agree on key goals and outcomes – these are no small feats.

To provide some help and guidance, in this section we:

1. Explore partner types
2. Match-make activities to partners
3. Outline principles for successful partnerships
4. Provide an opportunity for you to think through partner roles and level of effort (LOE) along the chatbot life cycle phase in a _Partner Engagement Mapping Worksheet._

1. Partner Types

There are some partners who you will approach on the basis of their expertise and experience with similar work - such as tech providers, system integrators, content producers, academic institutions, and civil society organizations.

But when it comes to sustainability, depending on your business model and proposed route to sustainability, partnership with either the **government** or the **private sector** or **both** will be necessary.

As such this module outlines **two categories** of partners:

A) Partners who are fundamental to your business model and sustainability strategy, and are therefore mandatory relationships which the implementing organization should nurture from the outset (not just at the approval stage).

B) Partners who are involved in all the other elements of the chatbot project lifecycle, where the implementing organization can pick and choose who to engage, when and how.

∞ Meta

A) Essential partnerships for your business model and sustainability strategy

Bilaterals: *government organizations which give direct assistance to a recipient country for development purposes. Bilateral donors are typically federal ministries, offices, departments, and agencies which give grants, loans, in-kind services, expertise, etc. to other governments, civil society, and multilaterals. In addition to being providers of official development assistance (ODA), these agencies have extensive development knowledge and expertise.*[100]

Government: *A Government Ministry, such as a Ministry of Health (or equivalent agency) is often a critical partner for any organization working in digital development. Depending on the country(ies) where you are working, you may have multiple government partners, e.g. at the national level through ministries for overall approvals and policy, and at state or sub-national levels for additional permissions and implementation purposes.*

➜ Governments have a strong mandate to provide approval, oversight and coordination of digital development interventions deployed in their countries.

➜ In many low-and-middle-income countries (LMICs), government permission is likely to be required to pilot and scale up digital interventions.

➜ Governments may regulate chatbots to ensure compliance with data regulations.

➜ Governments can help with integration of the chatbot with appropriate public sector programs, systems and connection to relevant databases (e.g. for apt booking).

➜ Ensure chatbots complement relevant national programs, initiatives, policies and systems.

◆ Can serve as a the most trusted source for your social good subject matter information (e.g. MNCH guidelines, understanding of local context)

◆ Can oversee and endorse the launch of a chatbot - providing a public display of support for the intervention and level of professional "PR"

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[100] https://proposalsforngos.com/all-about-bilateral-donors/

◆ Can play an important role as a convener of development sector partners to ensure alignment of the chatbot intervention and/or program with and coordination around national digital strategies.

When landscaping the existing digital ecosystem related to your social good area, you should consider the following steps related specifically to governments:

1) *Identify the relevant government systems and infrastructure that is already in place*, such as Health Information Systems (HMIS), reporting dashboards, data capture apps, data centers, telecommunication providers etc.

It is critical to understand the existing landscape of government solutions - what HMIS is the government using, are there multiple HMIS, do they allow interoperability with 3rd party systems, particularly those powered by tech platforms owned by foreign multinationals?

Essentially, understanding how the chatbot might plug into existing government systems is critical to sustainability, unless the chatbot aims to integrate with a private sector player's systems, for example a private hospital or medical provider.

It would be counter productive to design a backend database/s and reporting dashboards that duplicate government systems, as it is unlikely these will be approved/replace government systems.

2) *Identify the private sector partners* who the government is already working with, particularly those who are preferred suppliers and/or on retainers.

3) *Understand the regulatory environment and how it pertains to the chatbot*, for example privacy and data protection legislation, legislation about hosting or exporting personal data outside the country, information security audit requirements etc.

4) *Understand the major donors who the government is already working with.*

Meta

5) *Understand the government's current preferred INGO and local NGO partners and advisors.*

Working with governments may be both paramount for your success and exceedingly tricky. Here are some key considerations & helpful tips for this special partner type:[101]

→ Governments are bombarded by pitches for digital solutions, with few that are designed with government procurement policies, interoperability and operational feasibility at scale in mind.[102]

→ Many governments in LMICs are not interested in hearing from NGOs, so you may need to pitch with a donor, major private sector partner, UN agency or WHO at your side.

→ Government entities may lack the skills, experience, and/or expertise required to evaluate which digital interventions to adopt and then how to adopt and scale and manage them.

→ Government agencies may not have the same priorities and enthusiasm for potential for technology for development work. Carefully considering the needs and positions of each of these entities individually while understanding how they all fit together for a successful implementation is essential.

→ Significant government engagement is an investment that requires significant time and resources, capacity.

→ Plan ahead to dedicate staff resources to support government departments in launching and rolling out your chatbot intervention.

→ Be pragmatic and flexible about the timelines and resources required for government adoption and scale-up.

→ Demonstrate the value of your and/or your partner's technical support to government partners.

→ Develop models and strategies that take into account costing viable operational models at scale.

→ Align with government strategic interests and design, pilot, and adapt tools and processes at scale through existing government systems, rather than in parallel.

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[101] https://ssir.org/articles/entry/scaling_health_coverage_quality_and_innovation_through_the_public_sector#
[102] https://gh.bmj.com/content/6/Suppl_5/e005341

→ Partner with an entity or organization that the government already trusts, finds credible and valuable such as a nation level NGO or normative body such as a UN Agency.

Multilaterals: *Multilateral agencies provide guarantees and loans for investments that are aligned with their development goals. Their objectives, experiences and diplomatic leverage often enable them to provide political risk cover for countries and projects with higher political risks.[103] Examples include the World Bank, IFC, Regional Development Banks such as the Asian Development Bank, InterAmerican Development Bank, and more.*

Private Sector: *Your work with the private sector will be highly contingent on your chatbot design and business model. There will likely be multiple private sector partners engaged on the technology aspects of your work. Private sector partners may be key to the sustainability of the chatbot if you have a private sector business model, may fill donor or payor roles, and/or can be partnered with to fulfill technical roles.*

Examples include BSPs, ISVs, telecommunications companies, data aggregators and others, or if the chatbot is focused on health pharmaceutical companies, private insurance, health product and commodity companies, non medical health service providers and others.

It is recommended to partner with tech companies that have a strong record of delivering, maintaining and supporting robust solutions at scale in the geographies where the chatbot will be implemented.

B) Partners involved in all other elements of the lifecycle of your chatbot:

Academic Institutions: *educational institutions dedicated to education and research, which grant academic degrees. Examples: academic institutions with experience in research, science, social sciences, that work closely with government organizations or partner routinely with think tanks, NGOs, or foundations.*

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[103]https://rmid-oecd.asean.org/multilateral-agencies/#:~:text=Multilateral%20agencies%20provide%20guarantees%20and,projects%20with%20higher%20political%20risks.

Civil Society Organizations (CSOs) and Non-governmental Organizations (NGOs): *A broad group of organizations that are not part of the government sector come under the CSO umbrella, such as associations, societies, foundations, charitable trusts, nonprofit corporations and other organizations. The phrase non-governmental organization 'NGO' is somewhat contested terminology, and for many it falls under the broader category of CSOs.[104] A CSO is any non-profit, voluntary citizens' group which is organized on a local, national or international level.[105]*

International and Regional Level iNGOs are are not-for-profit voluntary associations operating at the international, transnational, global or regional level, with members or participants from many countries[106] where you plan to implement the chatbot.

National & Local level NGOs offer much of the same benefits to international and regional level NGOs, but often possess an additional level of cultural/ context-based knowledge that may be useful in conducting formative research. Finally, these NGOs are usually embedded in the communities that they seek to serve, and may have achieved a certain level of trust and respect which if done correctly they could transfer to the chatbot.

→ There are a number of iNGOs heavily investing in the digital for development ecosystem, and implementing digital interventions in growing numbers.

→ Thus, it is critical to be aware of what is already happening by and through these organizations as you make plans for the chatbot.

→ iNGOs can be important partners for sharing best practices, and learnings.

→ Working with them can help assuage any government or donor worry that your work is duplicative with other digital health solutions in the country, as many have grown weary from the inefficiencies created by "pilotitis."[107]

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[104]https://www.google.com/search?q=cso+vs+ngo&rlz=1C1SQJL_enUS903US903&oq=cso+vs+ngo&aqs=chrome..69i57j0i10i22i30j0i390i650.2123j0j7&sourceid=chrome&ie=UTF-8

[105] https://www.un.org/en/get-involved/un-and-civil-society

[106] https://www.encyclopedia.com/social-sciences-and-law/sociology-and-social-reform/sociology-general-terms-and-concepts-133

[107] https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-017-0275-z

➔ Depending on your target market(s) working with NGOs that have multi-country presence can be helpful if you plan to expand the scope of the chatbot to new geographies or launch in multiple geographies.

End Users: *Your most important partner is arguably the end user. End users are anyone who uses the chatbot. You may have intended end users, but there may also be unintended end users. For example, a new mother (intended end user) may show or share chatbot content with her household decision makers to explain why a vaccination appointment is important (Mothers-in-law and partners become unintended end users). As such, end users may consist of different categories of people that you identify in your formative research.*

➔ Many digital interventions are planned with the end user in mind, but not at the table (aside from some minimal engagement during testing sessions).

➔ End users can clearly define problems and scope solutions like no other partner, which helps avoid developing a solution that does not actually address the underlying challenges.

➔ As such, close collaboration with end users at all stages of the chatbot project lifecycle through [human centered design](#) and other participatory processes is not only appropriate and respectful, but vital to achieving impact.

Normative Bodies: a *set of global, regional and national organizations and associations that may provide standards and guidance relevant to health aspects of the chatbot.*

➔ The leading partner in this category if the chatbot focuses on health is the World Health Organization. Work to ensure alignment with the various guidelines and standards that have been developed and institutionalized for MNCH.

➔ Consider also global, regional and national professional associations that may be important to align with.

➔ While partnership with these bodies may be fairly passive (mainly references materials and ensuring alignment) there may be more involved engagement required.

Private Sector : (not related to the sustainability of your chatbot if you have a private sector business model). Read more about these in the full module - Technical partners. Key technical partner types for chatbots may include:

- **Business Service Providers** (BSPs) are third-party solution providers (typically marketing platforms or customer relationship management (CRM) solutions recognized by WhatsApp) with expertise on the WhatsApp Business Platform. BSPs often have their own chatbot platforms that use the WhatsApp Business Solutions API to have conversations with users over WhatsApp. Make sure the BSP hosts the data captured by the chatbot in-country, and that the government is ideally already working with them or at least won't have an objection to working with them (foreign BSPs may be problematic to government partnerships).

- **ISVs (independent software vendors)** make and sell software products that run on one or more computer hardware or operating system (OS) platforms. ISVs typically provide software in conjunction with a hardware, software or cloud platform provider. Examples include Amazon Web Services (AWS), Microsoft Azure and Salesforce AppExchange.[108] It may be mandatory to host within a country - both Amazon and Microsoft do this in many countries, but it is also key to check if they are government approved hosting providers in your target geography(ies).

2. Matchmaking Partners to Activities

Key activities throughout the project life-cycle of a chatbot can be achieved through a mix of partner types. Below we identify **11 of these activities** with organizations to potentially include. Different types of entities in the social good ecosystem can fill them – the way you match them is up to you, and how to approach them will likely become evident during your formative research. **Multiple types of entities** will likely be involved in these activities, but below there are guidelines on how to think through who could lead each piece.

Activity 1. Landscaping of the existing digital ecosystem: *to identify (i) key public and private sector players, (ii) similar digital solutions, HMIS, and*

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[108] https://www.techtarget.com/searchitchannel/definition/ISV#:~:text=An%20ISV%20

infrastructure in the country, including hosting environments, (iv) relevant government regulations, legislation and procurement guidelines.

→ <u>Organizations to potentially include:</u> local and national level CSOs, academic partners and tech partners such as BSPs.

Activity 2: Business model and plan development, fundraising: *After completing the landscaping, the business model should be developed. If it's a public sector business model, the government is a critical stakeholder. Which entity will lead fundraising, business model and plan development and execution? This is likely an organization with existing donor relationships, experience in engaging a variety of donor and payor types, managing finances, and more.*

→ <u>Organizations to potentially include:</u> International or national CSOs, social enterprises, government or private sector partners.

Activity 3: Resourcing and Financial Support: *Donors can range in terms of the level of engagement and input they want to have in an implementation. Additionally, they are bound by their own internal strategies and performance metrics and it is important to understand these at the outset. Finally, donors may be interested in resourcing specific stages of the implementation lifecycle. Make sure you understand these priorities and target donors based on where they best fit into your resource pipeline.*

→ <u>Organizations to potentially include:</u> Bilaterals, multilaterals, foundations, private sector, government.

Activity 4: Explore problem and scope solution - *market sizing and formative research - Which entities are best positioned to: (i) conduct secondary and primary research to identify needs, barriers and triggers of change within different segments of the target population,; (ii) based on this data, estimate the potential take up and use of the chatbot (market sizing); (iii) define the scope of the chatbot, and (iv) undertake more involved formative research?*

→ <u>Organizations to potentially include</u>: local and national level CSOs, academic partners and tech partners such as BSPs.

Activity 5. Content: *Which entities are best positioned to lead the content development, testing, adaptation, and coordination of content approval? They should have a deep cultural and contextual understanding of the social impact area (problem)/ subject matter expertise, potential end users, and potentially*

have expertise in human centered design and/or content creation for behavior change communications if relevant to the chatbot. Ideally, they must have the trust and respect of the national governments who will be involved in the specification of the technical information that will be covered in the content, and ultimately approve it.

→ Organizations to potentially include: local and national CSOs, state and/or national government health experts, donor health experts, the WHO, academic institutions, SBCC organizations and human centered design agencies.

Activity 6. Technology: *Which entities are best suited to design and build the chatbot, provide on-going user interface (UI) and user experience (UX) testing and iteration, provide data analysis, bug-fixing, and more? Ideally this entity would be based in the market in which you wish to implement, should host data in country (ideally with a government approved hosting provider), and as such have local expertise including local language capacity and even local marketing/ digital reach and engagement insights. Key considerations for how to choose the right technical partner are in the technology partner section of this playbook.*

→ Organizations to potentially include:- local and national CSOs, BSPs, ISVs and human centered design agencies. The CSOs are necessary because most BSPs and ISVs won't have subject matter expertise or HCD expertise.

Activity 7. Marketing: *Which entities are the best suited to marketing or advertising your chatbot, providing support around user acquisition and on-boarding? Likely an entity that has a deeply rooted cultural and contextual understanding of your end user group - ideally one that has experience in social marketing, digital marketing of chatbot interventions, or already works directly with your end users already. It's important to note that if you have a public sector business model and the route to sustainability which depends on government adoption, then much of the marketing and user-acquisition may be undertaken by the government, for example using public broadcasters, posters in primary health centers, promotion by frontline health workers, etc.*

→ Organizations to potentially include: National level CSOs, international CSOs, private sector tech companies e.g. BSPs and ISVs, Social Enterprises, or, depending on your business model, state and national governments through public sector broadcasters or their relationships with private sector broadcasters, as well as via the public health system.

Activity 8. Monitoring, Evaluation and Learning, Research: *Which entity is best suited to help design and implement your MEL plan? Design a theory of change? Lead an on-going research agenda? Ensure important indicators and findings are circulated among partners and donors and ideally that they contribute to improvements in the chatbot intervention and related government project/ program?*

➔ <u>Organizations to potentially include:</u> Research or academic institutions. Ideally, it would be best for it to be an independent third party academic institution that is directly contracted by the donor and where the scope of the research is approved by the government in advance. If the CSO leads, neither donors nor the government will take the results seriously.

Activity 9. Governance and coordination of/ across partnerships: *Which entity is best positioned to oversee governance of all partners and coordinate across them? This organization likely is also the lead implementer, but not always. The organization must have the bandwidth to lead efforts (usually on top of another role), have the respect and recognition of other partners - including the government, and be seen to be motivated not by organization self interest.*

➔ <u>Organizations to potentially include:</u> National or regional level CSO, government, social enterprise.

Activity 10. Lead implementation, program or project management and development: *an organization who leads or coordinates the activities across the phases of the chatbot development, from planning, to designing and implementing. Ideally an entity that has a deep understanding of the problem, target audience, development ecosystem at national level, is well respected and known in the target market and amongst partners and end users. One that has a track record of successful implementation of digital development interventions would be ideal.*

➔ <u>Organizations to potentially include:</u> CSO, private sector company, donor, bilaterals or multilaterals.

Activity 11. Government relationship outreach: *facilitation and management. If working with the government is part of your strategy for scaling, sustaining, and amplifying the impact of the chatbot, this activity should be integrated into all of the activities outlined above. This activity is also important for managing*

the PMU and the RACI partnership matrices, and for approvals and regulatory processes. Finding a partner who can manage this relationship is key-- ideally the partner that does this is already known and respected by the government and knows the ins and outs of the rules and regulations that would apply to chatbots in that specific country e.g. data privacy and protection, etc.

→ <u>Organizations to potentially include</u>: National level CSOs, BSPs, national level normative bodies, bilaterals or multilaterals, private sector.

3. Seven Principles for Successful Partnerships

1. **Get to know the players in the field, before you play it!**

   As you work to develop partnerships, it is key to do your **due diligence** to get to know the **key players** in the digital for development ecosystem in your target geography, and the related, complementary, or similar initiatives, paying particular attention to **existing government offerings** or initiatives already being implemented in partnership with the state or national government. If you happen to discover similar initiatives to the chatbot intervention that you are proposing, **explore ways to collaborate** or build on them, rather than creating something new.

   In particular you will want to identify and explore potential partners **whose interests overlap or activities impact the problem** the chatbot plans to or addresses; who possess human/ technical/ financial resources, expertise and influence that will provide **value to your work**; and who **control the relevant implementation processes.**[109]
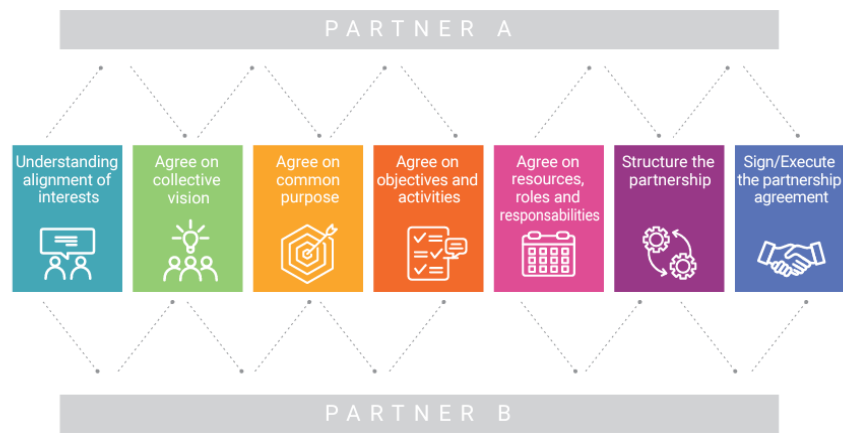
   Additionally, it is important to understand the government's **existing technology ecosystem** related to your social good area, and how **technology is regulated** in the country.

PARTNER A

Understanding alignment of interests | Agree on collective vision | Agree on common purpose | Agree on objectives and activities | Agree on resources, roles and responsabilities | Structure the partnership | Sign/Execute the partnership agreement

PARTNER B

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[109] https://sdgs.un.org/sites/default/files/2022-11/MEXICO_PARTNERSHIP_STRATEGY_2022-2025.pdf

∞ Meta

2. Build a solid foundation.

To form effective partnerships, first develop a **partnership strategy** which helps partners think through if and how there is a clear advantage to be gained by collaborating- that both stand to gain something worthwhile together that they could not achieve alone.[110] This process lays the groundwork for internal buy-in and commitment, and maps each organization's skills, assets and gaps.

Developing a partnership strategy may consist of mutual work by partners to:
→ Build a joint understanding of the objective.
→ Map partner skills, assets and gaps related to achieving the objective.
→ Internally assess the value, risks, and implications of potential partnership.
→ Understand how interests align, agree on a common vision and purpose.
→ Agree on objective, activities, roles and resources
→ Agree on how to structure the partnership
→ Develop partnership agreement

From there, the partnership strategy can evolve into a **partnership agreement** (such as a memorandum of understanding MoU, memorandum of agreement MoA, or letter of intent LoI) that establishes roles, responsibilities, ways of working, timelines, expectations, and goals for success and how to measure these.

This foundation, if laid well, can help subsequent stages of your partnerships succeed. We provide a **template** at the bottom of this module to assist you in thinking through your strategic approach to partnerships.

3. Don't lose sight of what it's all about.

While different partners may be involved in the work around your chatbot intervention for slightly different reasons, you need to agree (early and remind yourselves often) on what is the **ultimate social good outcome** you seek to achieve with the chatbot intervention. While this may seem simple, it is easy to diverge and **lose sight** of this as partnerships evolve and the work grows. Different entities will inevitably have their own indicators and metrics for

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[110] https://www.jstor.org/stable/24757438

success and impact, but these should be **complementary** and/ or **feed into** the overall social good outcome. This is a key activity from the strategic plan above, but it warrants its own call out as an individual principle.

4. Don't just cooperate or coordinate, collaborate.

Being collaborative means "sharing information, insights, strategies and resources across projects, organizations and sectors, leading to increased efficiency and impact."[111] This kind of effective collaboration doesn't just happen, it takes **time, planning and resources**. For example, significant challenges, successes, lessons learned or problems that originate from one partner's area of work likely have direct implications for another partner's area of work, AND would benefit from collaborative learning or problem solving. Think about ways to **ensure knowledge flows** amongst partners and moments are carved out for collaborative thinking and action. This could be a bi annual workshop, an internal hackathon, monthly report development and circulation, or a cross-cutting dashboard.

Or, you could set up a **Program Management Unit** (PMU) to coordinate work across the consortium of partners. This could consist of representatives from each of the stakeholders, but if it's a big project, each partner will require at least one dedicated person, if not two. Consider co-locating one of those people with the government if at all possible as it can be one of the most effective ways of getting them on board and building trust.

Finally, you may also want to explore creating a **RASCI matrix** (Responsible, Accountable, Supportive, Consulted, and Informed)[112] that details the responsibility of each partner.

5. Be willing to compromise.

Compromise is part of any healthy relationship, and will be vital in navigating your partnerships **across sectors**. For example, you should be willing to compromise if you plan to work with partners to take the chatbot to scale, and if your sustainability strategy relies on public sector funding – you will likely

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[111] https://digitalprincip.wpengine.com/principle/be-collaborative/
[112] https://www.interfacing.com/what-is-rasci-raci

∞ Meta

have to have the ability to adapt the interventions and/or program without losing their effectiveness[113] - a process achieved through compromise.

★ ***For example, in India,*** *when the government decided to scale digital health interventions **Mobile Academy and Kilkari** nationally, several important compromises to the service design were required to accommodate budget and procurement policies, and to overcome the challenges involved in trying to reach low-income illiterate women. Ultimately, these compromises helped enable greater affordability of these digital solutions at scale.[114]*

6. Grow together not apart.

Regularly **assess the effectiveness, efficiency, and impact** of your partnerships to determine whether you may need to adapt or adjust roles and responsibilities, or whether it is time to **renegotiate** certain aspects of the partnership(s) in place. For example, as you continue to understand your own skills and gaps and those of existing partners in practice and as the work evolves, you may need to bring in other partners, particularly as the chatbot intervention scales or if it is adopted by the government.

7. Work locally, learn and align globally.

End users, local organizations, companies, and governments are uniquely suited to understand, and address local problems and their solutions in effective and lasting ways. Best practices often resonate across countries, so **global learning networks** are valuable. Additionally, working with or linking to international normative bodies such as the UN to ensure **alignment with the various guidelines and standards** that have been developed and institutionalized is important.

In addition to the fact that **local governments** are uniquely suited to understand and address local problems, simply put they are in control. There may be regulations that prevent government procurement of foreign tech companies or INGOs, or restrict hosting of health data to specific providers, including government hosting entities. If you are an INGO or other foreign entity, it's key to recognize that you ultimately may not be eligible to provide

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[113] https://ssir.org/articles/entry/scaling_health_coverage_quality_and_innovation_through_the_public_sector#
[114] https://gh.bmj.com/content/6/Suppl_5/e005341

digital services to the government in a LMIC (due to government procurement policies and also legislation), that you may be required to **host locally** and potentially in a government hosting environment.

4. Partner Engagement Mapping Worksheet

Now that you you have thought through some of partners who may be engaged with your project, as well as the activities they may be poised to participate in, you are ready to map partner engagement and level of effort (LOE) in the following [Partner Engagement Mapping Worksheet](#) along the [Project Lifecycle](#) (Analyze and Plan, Design, Develop and Demo, Implement, and Scale and Sustain):

Instructions:

➔ Starting with the first column, **name the key partners under each type** who are necessary to engage with given your geographic location, use case, business model and end user. Add additional rows for each specific partner for each partner category. Err on the side of creating more rows than fewer, breaking out specific partners for their own mapping. Doing this may illuminate some areas where additional focus is needed, or perhaps duplications or inefficiencies in your implementing model.

➔ Then **fill out the first row** for the Project Lifecycle for you as the lead implementer. *Based on the work that you have completed in previous modules, what activities will your organization be most involved in? Where do you have expertise? Where will you be relying on partners to support the project? A number of example activities have been provided, but there are likely more that need to be assigned based on the unique parameters of your project.*

➔ Then **fill out the level of effort** (LOE) row associated with the activities that you have assigned yourself. This should reveal where you may need to invest additional time and resources.

➔ Now **complete the remainder** of the table for the partners you have identified. What types of activities will they need to conduct to

complete the Project Lifecycle? *What level of effort will be required from them along the way? (High, Medium or Low)?*

➜ Are you working in a particularly **complicated environment?** Does it seem like there is **lack of clarity** about roles and responsibilities?

- ◆ **Consider a more robust version of this mapping,** 1) Create sub-columns for the activities that fall under each of the lifecycle stages. 2) Assign partners using a more detailed RASCI or RACI model or similar (as opposed to the simplified Low, Medium, High LOE categories).

- ◆ **Use this mapping as a consultative tool with partners.** Ideally, meet with key partners together, or alternatively with each individually, to agree on specified roles and responsibilities. Document partner agreement.

Chatbot Project Life Cycle Stages & Illustrative Activities

	Analyze the problem, scope the solution: Landscaping the digital ecosystem Market sizing and formative research	Define your Impact: Monitoring, evaluation, learning and research	Plan and Strategize: Business model and plan development, fundraising Resourcing and financial support Marketing Governance and coordination of Lead implementation	Design, Develop and Demo: Pilot, iterate, test, iterate Content Technology	Implement	Scale and Sustain
This is you! What activities is your organization best poised to lead on? Where will you play a supporting role?						
What will your LOE at each stage?	▾	▾	▾	▾	▾	▾
Academic Institution Partner						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
Bilateral Partner						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
CSO and NGO Partners						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
End Users						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
Government Partners						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
Multilateral Partners						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
Normative Partners						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾
Private Sector Partners						
Level of Effort and Engagement	▾	▾	▾	▾	▾	▾

Complete the worksheet [here.](here)

Key Lessons Plan & Strategize- Partnerships

❖ **Digital development projects are done best through a consortium of partners across sectors.** Clearly articulate and agree in writing roles and responsibilities of each from the start- bearing in mind that these and the level of effort (LOE) for each will evolve throughout the program life cycle.

❖ **It is essential to set-up clear governance structures during the pre-implementation phase** to build trust, mutual understanding, inclusiveness and ownership among partner organizations, as well as to clearly outline terms, roles and responsibilities early on to avoid confusion and redundancy. RASCIs are a useful tool in this process.

❖ **Governments can be both great enablers and barriers to scale and sustainability.** Being able to forge and successfully navigate government relationships is fundamental. However, significant time and resources are required to broker these relationships and hand over digital programs successfully.

❖ **Depending on the country(ies) where you are working in, you may have multiple government partners** and these agencies may not have the same

priorities and some may be more enthusiastic about the potential for technology than others. Carefully considering all these entities individually is essential.

❖ **Your most important partner is of course, the end user.** Close collaboration with your end users at all stages of the process through human centered design and other participatory processes is not only appropriate and respectful, but key to the effectiveness and impact of the chatbot in addressing the problem it seeks to address.

Resources - Partnerships

➔ Ten lessons learnt: scaling and transitioning one of the largest mobile health communication programmes in the world to a national government
➔ Digital Principles Key Partnerships Overview
➔ Mobile Alliance for Maternal Action (MAMA) Lessons Learned Brief
➔ Principles for Digital Development - Be Collaborative

∞ Meta

Design, Develop & Demo
Content & Technology

Content

> *What content should be developed/ used for/by the chatbot, how can this be turned into or adapted into compelling messaging for your target users? How do you ensure your content is adapted to local contexts? Who should be involved in this process and review and approve the content?*

In this section we outline and provide tools for the following steps **1. Topic mapping, 2. Creation** of engaging content, **3. User testing 4. Adapting your content** to the local context, and **5. Expert review** and approval. If you would like a general overview of some of these processes, here is a sample step-by-step guide to creating content which covers key activities and partner roles.

1. Topic Mapping

A topic map is a mapping of technical information that needs to be **communicated** (or key messages, depending on your use case) by the chatbot, which may be **outlined** along a **timeline**. For example if the chatbot will provide maternal and newborn health information, messages would likely span and be aligned to development from week 5 of pregnancy to week 52 of the baby's life.

The topic map is also intended to be designed so that **experts can use** it to review the content and provide **organized feedback**. After the experts review the topic map, it can serve as a **blueprint** for your content team to further develop the content (personalize it, adapt it, play with the flow, etc.)

Elements of a topic map can include:

> ➔ **Key messages:** (potentially against a timeline)
> ➔ **Notes and references:** for each message – key points to consider, justification for choosing that message and references
> ➔ **Questions for experts:** the topic map will mostly likely be based on desk research. Experts can be recruited to provide input based on their field/ practical experience and subject matter expertise.

Step 1. Identify the main issues

It is advisable to research relevant **global guidelines** and evidence to **identify the main issues** underpinning your social good area or problem you plan to address by normative bodies such as UN organizations, leading international nonprofits and others. Content recommendations should also potentially be based on **studies** high in the hierarchy of evidence – such as systematic reviews, randomized controlled trials (RCTs) and cohort studies – after carrying out a critical appraisal of the studies.

After identifying key issues, you can think through **which warrant inclusion** based on whether or not they are **suited to be addressed via chatbot.** Many of the key changes that are needed to improve social good issues are governmental, institutional and financial. Taking the example of MNCH, some of these interventions, such as encouraging women to seek medical help at key points, can be supported by chatbots. Others, such as building the infrastructure to supply front-line health-care workers, are not issues that can be tackled in a chatbot.

★ Here is an [example topic map](link) **core technical health information** or key messages recommended by WHO covering key health interventions in maternal and newborn health. Underpinning these interventions would also likely be **general content** on nutrition and hygiene, depending on the chatbot use case and target users.

Step 2. Identifying specific interventions for inclusion

After **identifying the main issues**, each issue should be explored further.

The purpose of this **deep dive** is to identify the main interventions that have been **recommended by experts** to tackle each of these issues. The table to the right provides **an example of key interventions**[115] identified related to the topic of diarrhea in infants.

Stage	Intervention	Source	Type of evidence
Postnatal care	ORS	MOST: The USAID Micronutrient Programme	Guidelines, RCT, Systematic Review
Postnatal care	Clean drinking water	WHO, MOST: The USAID Micronutrient Programme	Guidelines
Postnatal care	Exclusive breastfeeding for six months	WHO, MOST: The USAID Micronutrient Programme	Guidelines
Postnatal care	Personal hygiene	WHO, MOST: The USAID Micronutrient Program	Guidelines
Postnatal care	Food hygiene	WHO, MOST: The USAID Micronutrient Programme	Guidelines
Postnatal care	Rotavirus Immunization	WHO	Guidelines
Postnatal care	Zinc supplementation	WHO, MOST: The USAID Micronutrient Programme	Guidelines

Step 3: Identifying main barriers and motivators

The **main barriers** and **motivators** for each intervention should be identified if your chatbot intervention is aimed at **changing or driving a particular behavior.** This would likely be done in your formative research but can be further parsed out with **subject matter experts** in this content **review process.**

Step 4. Create a flowchart/ decision tree illustration of your topics

You may also want to **organize the main health issues** with some form of coding, categorization, sub-themes and themes both in an excel sheet and then also into a **conceptual map**. This could be a useful way to explore how your topics and themes are **related** and then later may be useful to refer back to as you **design conversational flows**. An example of how this was done by developers of an Indonesian chatbot is displayed below.

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[115]
https://docs.google.com/presentation/d/1NJul2yiMjbapdRAcOTqHP2bMXTwKWFGH/edit?usp=sharing&ouid=109277968687693784416&rtpof=true&sd=true
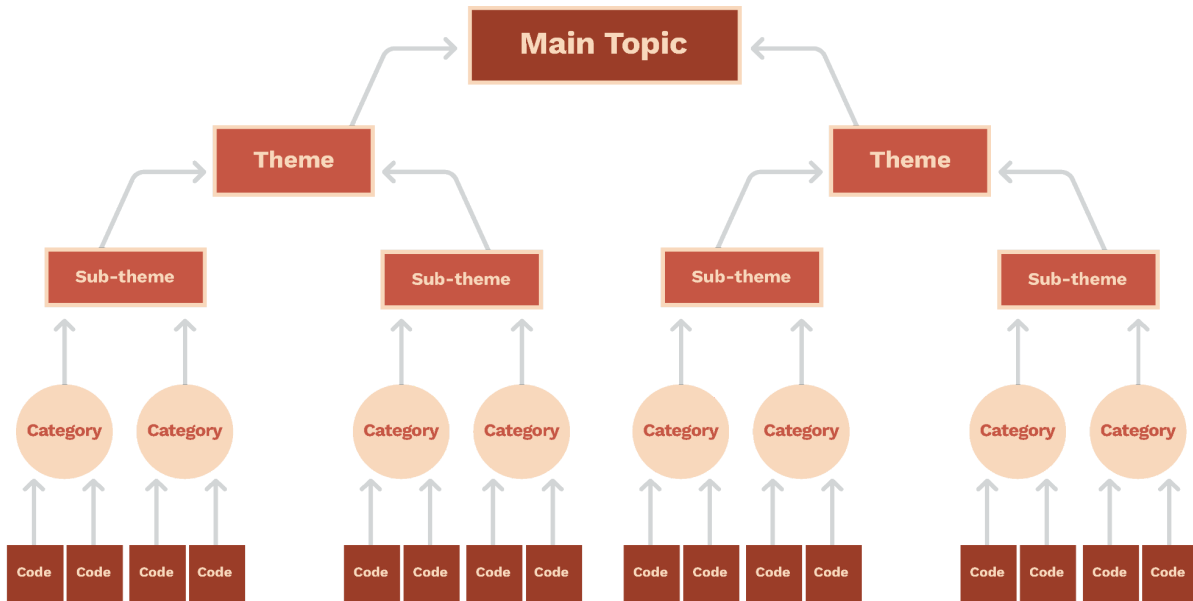
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Figure 12. Example of a Visual Illustration of Health Topic Map[116]

2. Create effective and engaging content

Once you have a topic map you will need to turn this list of information, interventions and guidelines into compelling, engaging, helpful content that will drive conversations with your chatbot.

Research on chatbots, digital health interventions and social behavior change communications has found that it is often **not enough** for content on health information to be **credible** - it also has to be **understandable, engaging, actionable** and **grounded in local culture** and realities.

Additionally, simply delivering informational content rarely results in behavior change, because lack of knowledge is rarely the only barrier to adopting the behavior. If this is the intention of your chatbot, to influence behaviors, you should consider how to break the desired behavior change down into **small actionable steps**, address the psychosocial and environmental **barriers to change** that people face, and suggest **possible ways to overcome** those barriers.

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[116] Image based off of https://www.mdpi.com/2227-9709/9/4/88

Meta

Even if your chatbot use case is not focused on behavior change, **content quality** can still strongly impact user's **perceptions of usefulness** and **enjoyment of the intervention**, which in turn can influence their intention to use it.[117]

So, how do you take health topics like those outlined in the [content map above](#) and turn them into effective and engaging content for your target user(s)? Each intervention can be **broken down** into **key messages** that would work as chatbot content.

Based on the available evidence on chatbots for social good as well as lessons learned from digital for development in general, here are **7 basic principles** you can use when turning your subject matter content into compelling chatbot messages.

1) Write content from the user's perspective

Content written from a **top-down perspective** may not be effective for your chatbot use case and target users, as it can sound like information is coming from an unknown higher authority or a foreign agency, and thus may be less likely to be accepted and well-received.

Bottom-up content, on the other hand, may help foster the feeling of a more balanced relationship between the user and the chatbot. It can help build trust by speaking the way the audience itself communicates– using language, scenarios and references to which they can relate and speaks directly to users' realities, values, priorities, and experiences.

Finally, a bottom-up approach uses content (and conversational design) to **give advice, not orders**. Being direct, respectfully of course, *only* when it matters will help the recipient to understand when something is vital.

★ **Here is an example of an MNCH message written from top-down perspective:**

"You can keep a close count of the movements of your baby now by keeping a

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[117] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7970298/

record. Three times in a day after meals you should count the movements of your baby. Multiply it by four. The result should be more than ten. If it is less, then you should keep a closer watch. If it is decreased two days in a row, it might be a danger sign for the baby and you must report to your doctor."

This sounds complicated and prescriptive – like something you would find in a medical textbook. It doesn't speak to the mother's feelings and instead may cause stress and anxiety.

★ **Here is an example of the same content from the bottom-up perspective,** where the message is also about monitoring fetal movements but it speaks to the mother at her level and so is more mother-centric. It gives her signs that she can easily look out for without having to sit there with a calculator (a more realistic and actionable approach) and therefore gives her the confidence to do it.

"It's exciting when you first feel your baby move! If this is your first pregnancy, you may not be sure what the movements are at first. They feel like gentle butterflies fluttering in your belly. In the next few weeks, your baby's movements will get stronger and more regular. Your baby won't move all the time. Like you, sometimes he'll just want to rest and sleep. You can get used to recognizing the movements. Remember his daily routine, when he is awake and when he goes to sleep. Tell your health worker if you notice a change in his routine. If you haven't felt your baby move yet, speak to your health worker. She will be able to check that everything is well."

2) Make an emotional connection

Depending on your chatbot use case, it may be helpful to consider developing chatbot content that makes an **emotional connection** with the user. Research suggests that chatbots that engage in **relationship building** are perceived as more credible, sympathetic, empathetic,[118] and that their recommendation messages are sincere.[119]

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[118] https://dl.acm.org/doi/abs/10.1145/3491102.3501936
[119] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4305315

Research has also found that **people interact with computers as they do with other people**, without even being aware that they are doing so[120] and form perceptions of computers and humans in the same way, even though they know computers are machines. These tendencies have been observed across different kinds of computers and chatbots.[121]

As such, leveraging content (and other features) to **create an emotional connection** between chatbots and users is both feasible and logical.

One way to do this is to consider **giving the chatbot a persona**. You will most likely want to use human-centered design and conduct formative research to select and localize a persona.

Personas may consist of a **name, avatar, linguistic style, tone** (which may change depending on the subject matter in the conversation or interaction type) and graphical appearance including colors and emoticons/ emojis.[122] **Opening and closing sentences** can convey the chatbot persona's tone to further build the emotional connection - for example to create a relaxed tone and feeling of understanding and warmth. Chatbot personas should be **conveyed consistently** throughout engagement with the chatbot. Examples of chatbot personas include:

1. **AskNivi**[123]: Reproduction health chatbot AskNivi uses a trusted aunt chatbot persona in India and a big sister chatbot persona in Kenya.

2. **Yukti**[124]: The Yukti chatbot in India used an avatar of a woman in late 30s, and users perceived Yukti as a human being - "some correlated its persona as a lady doctor and some as a friendly sister like ASHA. The way users framed their questions and reacted reflected their perceptions".[125]

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[120] Reeves & Nass, 1996
[121] Eyssel & Hegel, 2012
[122] The use of emoticons should be carefully considered and evaluated among the target user groups. It has been found for example in some settings that too many emojis in a medical chatbot undermined the seriousness of the content or felt "too jokey." There are many ways a chatbot could convey an emotion without using an emoji, for example a happy chatbot can emphasize that feeling by the use of exclamation marks. https://www.diva-portal.org/smash/get/diva2:1230334/FULLTEXT02.pdf
[123] https://www.nivi.io/
[124] https://dl.acm.org/doi/pdf/10.1145/3359272
[125] https://dl.acm.org/doi/10.1145/3359272

3. **Woebot**[126]: *Interacting with human-like AI can result in a sense of unease and "creepiness" that results from when something that is artificial tries to appear human-like. To combat this, mental health chatbot Woebot was designed to transparently present itself as an archetypal robot. The developers speculated that transparency is a key driver of bond development and as such, "Woebot explicitly references its limitations within conversations and provides positive reinforcement and empathic statements alongside declarations of being an artificial agent."*[127]

4. **Dr. Joy**[128]: *The Korean chatbot, Dr. Joy, was designed to lead users to perceive enjoyment when seeking health information and medical help for their prenatal and postnatal care. In order to look more professional Dr. Joy was given a "humanlike" female medical doctor persona and a formal, firm tone, particularly when answering questions but a warm tone (via informal, pleasant tone, manner, and emoji use) when treating users in other scenarios.*

5. **"How to Boost the Effectiveness of Chatbot Recommendations for Increasing Purchase Intention**[129]**"**: *After testing two different chatbot personas - warm vs. competent - the researchers recommended that companies use a warmly designed chatbot if they want to strengthen the customer-chatbot relationship and competently designed chatbots if they want to strengthen message quality.*

In addition to leveraging a persona, the **linkage of a user to a human** (this could simply be a link to an active call center phone number) at the right time and in the right way is helpful in creating an appropriate and supportive emotional connection with the chatbot.

3) Personalize the content

A personalized message is **tailored** to suit the user. It enables them to feel that the information is just for them. Chatbot content presents a great opportunity for personalization; as the phone is in the user's hand which feels close and private. Chatbot messages can cover topics that users may find hard to talk about with others.

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[126] https://www.medicaldevice-network.com/features/mental-health-chatbot/
[127] https://www.medicaldevice-network.com/features/mental-health-chatbot/
[128] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7970298/
[129] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4305315

Meta

According to metadata analyses (Head et al. 2013), interventions are most successful when both tailored and targeted messages were sent to participants. Interventions were more effective when participants' demographic and psychosocial attributes were factored into message personalization. Personalization strategies, such as using participant's name or the name of their child were found to increase intervention efficacy.

Tailored & targeted messaging	Tailored messaging	Only targeted messaging

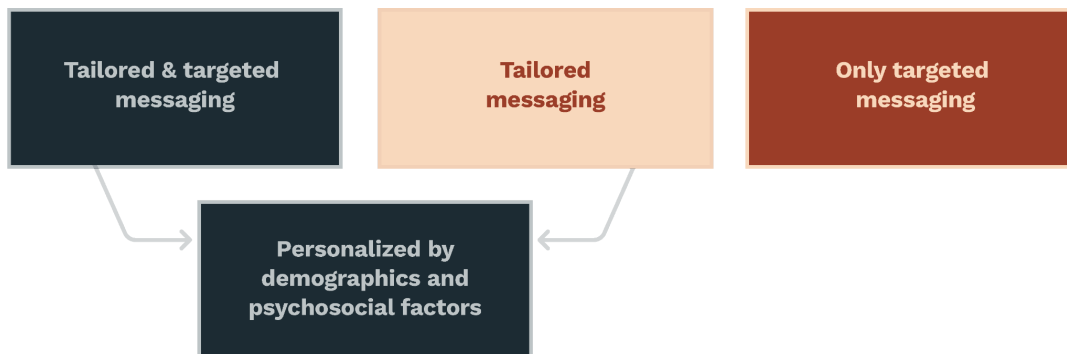Personalized by demographics and psychosocial factors

Figure 13. Success by messaging type

Consider making content convey that it is **speaking directly** to someone - you can talk just as you would in a **conversation** if you were standing next to someone. For example, instead of "the mother should go to the clinic" the chatbot would say *"You should go to the clinic."*

In a similar vein, carefully **consider who you are most likely to be speaking to**. In some areas, people may share phones, so think about how your content will reach your intended recipient. For example mobile handset ownership may be restricted for some women and girls, so consider whether you will communicate with a "guardian" or "gatekeeper" first.

Opening sentences could further the sense of personalization via direct acknowledgment and/or encouragement. For example by replying *"Good question!,"* the chatbot can directly address the user, creating a personalized answer. **Closing sentences** could reflect follow-up questions, to understand the user's current state or to ensure a function was completed or a question was answered correctly.[130]

[130]https://www.diva-portal.org/smash/get/diva2:1230334/FULLTEXT02

Finally, chatbot content can use personalized content through **follow-up questioning** to create a more human-like feeling in the interaction, conveying a sense of care and understanding. At times users engaging with chatbots may be out of questions and counter-questioning by chatbots may be helpful to re-engage them.

★ *In India for example, the Yukti chatbot asked at least one question and presented one fact in every session with users. Researcher's found user excitement increased when they were able to give correct answers to the follow-up questions and received messages of appreciation. users even requested an increase in the frequency of counter-questioning.*[131]

4) Keep it short and simple

Keeping the language simple, with short, simple sentences to make it clear what action the person needs to take and how to take it, bearing in mind the literacy of the recipient may not be high.

Use **everyday words**. Avoid polysyllabic words wherever possible. For example, talk about eating well, what's healthy and what's good to eat and drink, rather than 'nutrition' or 'diet'. In general, **avoiding jargon** and detailed or advanced terminology is a good practice.

Many languages have **formal and information styles**, so in your formative research, and localization processes decide if you will use the formal or informal styles or a mix depending on subject matter and other factors (such as your chatbot persona!)

In general, consider using **as little text as** possible. Keep in mind that the channel for many chatbots, WhatsApp, is not a place users go to browse lengthy or text heavy content, they go to get something done or chat. Chatbot messages/content across use cases should take this into account.

Think about how content looks on a mobile phone, which is most likely where your users will engage with your chatbot - **long messages look cramped** and

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[131] https://dl.acm.org/doi/10.1145/3359272

∞ Meta

require **lots of scrolling** to read because of the way the chat UI is structured.[132]

Recommendations on length range from the Twitter rule[133] i.e. keep each message **under 140 characters**[134], to no more than 450 characters, to keep users from losing interest. **Test** with your users to see what makes sense given the chatbot's use case.

Finally, it may be helpful to have **messages focus on one concept**. If you need to convey various things, consider sending them separately.

5) Leverage visuals, videos, graphics and voice recordings to complement text-based content

These methods may be particularly useful for users with **low literacy levels**, but also for specific content including visual depiction of warning signs, demonstration of breastfeeding techniques and more. Audio based navigation and AV content may work well. However, explore inclusion of some **text to explain** what visuals, videos, and graphics are, and what they are for.

6) Link information to action, and if you intend to change behavior, underpin approach to a relevant theory

When users engage with the chatbot, consider how content can **prompt them to take action** - to translate information into a desired behavior, completion of a task, etc.

If content contains messages that aren't actionable or that suggest actions beyond the users' control, it may cause feelings of guilt or a failure, **loss in motivation** and/or engagement with the chatbot. As such, think about creating content about things which users do have control over.

For example, don't have the chatbot say - *"Eat an egg or some meat or lentils every day"*, instead have it say- *"Try to eat an egg or some meat or lentils everyday."*

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[132] https://uxdesign.cc/chatbot-building-best-practices-why-message-length-matters-e951bed1b550
[133] https://uxdesign.cc/chatbot-building-best-practices-why-message-length-matters-e951bed1b550
[134] https://learn.turn.io/article/160xc9sr1f-how-to-create-good-content-for-whats-app

In addition, if your chatbot aims to change behavior, it's a good idea to underpin it to some kind of **behavior change theory** and develop your chatbot intervention and its content, features and functionality to align with this theory.

For example, **BJ Fogg**[135], founder of the Behavior Design Lab at Stanford University, has a model that shows that **three elements must converge** at the same moment for a behavior to occur: **Motivation, Ability**, and a **Prompt**. When a behavior does not occur, at least one of those three elements is missing.

Spark - Messages that motivate	Simple - Making behaviour change easy	Signal - Trigger/Prompt to act
Reasons for why exclusive breastfeeding is important and the benefits of exclusive breastfeeding for the mother and her family.	The messages need to tackle perceived barriers to exclusive breastfeeding and create an enabling environment	Messages need to be sent at the right time, exactly when behaviour change is needed.

Figure 14. Application of Fogg's model to messaging around exclusive breastfeeding

Another behavior change theorist, **Prochaska**, posits that behavior change goes through **five stages**, and that a behavior change communication program should **tailor its messages according to the stage** of change a person is at.

Precontemplation	Contemplation	Preparation	Action	Maintenance
Importance and benefits of exclusive breastfeeding	Introduce exclusive breastfeeding with advantages and challenges	Address myths and misconceptions and other barriers to exclusive breastfeeding	Make messages actionable for the mother and give specific suggestions	Positive reinforcement and support

Figure 15. Application of Prochaska's model to messaging around exclusive breastfeeding

Behavior change can be made easy by breaking it down (the behavior and the content) into **small actionable steps** and **addressing the barriers** to behavior change.

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[135] https://behaviormodel.org/

7.) Keep it fresh and updated

High quality, engaging content should **not be static**. It requires regular updates as well as reassessment for new target groups and geographic locations. You should plan to add additional content and update existing content as your user group grows, as you conduct M&E and additional user testing, and expand to new geographies.

New content, developed and leveraged in the right way, can be a key component to **drive engagement**. For example, global and national guidelines on the health topics covered in an MNCH chatbot will be updated, so make a plan to review these and update the content accordingly at a routine and agreed upon intervals.

3. User Testing

Once you have developed content and a prototype it is essential to conduct user testing to find out which features, functions, flows, wording, vocabulary and concepts work and which don't with your various user(s) in a **real world context** (tip – test on various types of users' mobile phones!) and change them before they're implemented.

If you are building a chatbot, you will need a prototype to test its content, features and elements. One of the ways to test a chatbot is using the **Wizard of Oz method**[136], which makes users think they're interacting with the final chatbot, when they are interacting with a fake interface in which the replies and other interactions are being generated by humans.

Another method that you can explore for user testing is called **"task-based usability testing**[137]**"** which posits that the most effective way of understanding what works and what doesn't in an interface is to watch people use it. An overview of how to carry out task based usability testing is included in the link in the footnotes here and also in the resources at the end of this module.

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[136]https://www.nngroup.com/articles/wizard-of-oz/#:~:text=Definition%3A%20The%20Wizard%20of%20Oz,Norman%20at%20UC%20San%20Diego.
[137] https://www.nngroup.com/articles/task-scenarios-usability-testing/

∞ Meta

Areas to assess and key questions to consider in your user testing include:

- **Are users satisfied with the chatbot?**[138]
  - Do they find it useful?
  - Are they able to navigate it?
  - Do they find it valuable in providing its intended functionality/ helping them achieve their goals?
  - Does the chatbot correctly answer questions/ complete tasks?
  - Does the chatbot take the right amount of time to perform a function/ task or answer a question?
- **Do users comprehend, enjoy and recall chatbot content?**
  - Can users read the content? Are they literate enough to do so?
    - Or, if there are literacy barriers, how much text should there be? How can you leverage audio based navigation and AV content? How is that received?
    - (If relevant) do characters render on users' phones?
  - Do users comprehend content?
  - Can users recall content if asked to do so?
  - Do users think content is relevant and engaging?
  - If users are literate, what languages and dialects do your users feel most comfortable reading in?
- **What are user perceptions of chatbot:**
  - The tone/ persona/ dialect?
  - Use of emojis? Images?
  - Name, brand identity, logo, color pallet, iconography
- **Sign-up/ on-boarding process:**
  - Do users understand how to sign up?
  - Were users able to complete sign up correctly?
  - How difficult do they find it to complete?
  - Was it clear or confusing? Why?

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[138] You can measure usability with the Usefulness, Satisfaction, and Ease of Use (USE) Questionnaire

○ Were users informed (and do they comprehend) by chatbot or through another method (person, marketing materials, etc.) what the chatbot is for, how to communicate with it?

○ Were users informed and do they understand how to opt-out of the service?

● **Privacy and data protection:**

○ Do users read/listen to the privacy and data protection policies?

○ Do they comprehend the privacy and data protection policies?

○ How do users feel about the privacy and data protection policies?

4. Adapt content to the local context

You need to make sure your **content resonates** and is **localized to the context** where you will be implementing the chatbot. To begin the localization process it may be helpful to make sure each set of messages or content topic has accompanying notes to **highlight specific words** in each which you will need to make suitable for your audience.

Using the MNCH example topic map, the areas to consider are:

The health care system:

➔ There were four prenatal check-ups in the topic map, based on the global minimum recommendations of WHO. If your audience would expect more, you could adapt the messages to meet local expectations.

➔ Iron and folic acid tables are mentioned, which are free in many settings, but you would need to amend them if they are not.

➔ Vaccination information to fit local scheduling, high risk locations and populations

➔ The health care infrastructure: the map uses the word 'clinic', for example, but you would need to use what is appropriate

Health care language: the term 'health worker' is used, but you would need to adapt this to suit local conditions. Is it a midwife, a nurse, a doctor that a woman would most likely interact with?

Foods and produce: You would need to replace food items with ones your users

are familiar with.

Local customs and practices: In many cultures,for example,it is common for women to eat certain foods or non-foods during pregnancy; you would need to find out what the local practices and beliefs are and adapt the content accordingly.

Fetal development messages: even though fetal development is the same across contexts, perceptions of the fetus and its development vary widely - especially as access to ultrasounds and medical knowledge of fetal development may be limited in some low resource settings.

★ With the text messaging program MAMA for example, an affiliate in Malawi discovered that some users found these messages had a creepy ability to predict what women were experiencing, deeming them "demonic."

★ In rural western Ethiopia a mobile messaging program called LUCY learned via user focus groups that women found these messages amusing, but abstract and lacking credibility ("How is it that a baby has eyelashes when I cannot feel it move?") and undermined the seriousness of the other content. As such this content was adapted in Malawi and omitted altogether in rural Ethiopia.

5. Expert Review and Approval

All social good content should undergo a detailed review by subject experts, potentially making up some kind of a **"content advisory council."** This review should happen every 1-2 years to update content to reflect the latest recommendations and protocols.

Next, you may want to set up an **Expert Review Committee**, consisting of local advisors to check that the content is correct for the intended users, adapt content to reflect local conditions and to address local concerns/ needs and systems.

The Expert Review Committee may have at least **one specialist per social good focus area** (e.g. if you plan to cover pregnancy and newborn health, one pregnancy specialist and one baby specialist.) You may also need an

immunization specialist and an infant-feeding specialist. Additionally, in most countries, you will need **input and approval from a Ministry** or other government entity.

Look for experts who have worked on the front line. They will have insights into local conditions and needs. For example, you may find that trained birth attendants or health workers from clinics have useful input on local terms, expressions and concerns.

In addition, you should carry out focus groups and clinic visits with the target community to **identify issues that may not be reflected in published literature.** You can feed the findings from focus groups and clinic visits into the content localization process.

Expert review timeline

1. <u>INITIAL CONTENT REVIEW (3-4 weeks):</u> If your experts have internet access, consider putting the content online - in an evolving topic map- as a Google document. Add columns where each reviewer can write their comments. This also means the reviewers can see each other's comments and will often answer each other's queries. If geography allows, consider holding a review meeting. Print out the content, put them up on the wall and invite experts to discuss and write their comments on flipcharts next to the messages.

2. <u>ADAPTED CONTENT REVIEW (2-3 weeks):</u> Adapt the content and circulate. Make sure you have consensus on the changes. That is not easy, of course! In localization, be careful not to lose the key elements that make the content works for mothers: they are written from a bottom-up perspective and positively reinforce key points, they make an emotional connection, they are personalized. Keep your advisors happy! Keep them informed, acknowledge their work, answer their queries and let them know the results of your focus group and any other feedback you get on the program.

3. <u>TRANSLATION</u>: Once your messages have been medically reviewed and adapted, you need to translate them into your local languages.
   - *Bi-lingual local editor reads the messages in English and flags any issues around localisation/translation.*
     - Ask the editor to highlight any words and expressions that do not make sense in the local language. Agree on replacement words before giving the messages to your translator. This helps to make

sure that the translator does not make a substitution which may be unsuitable.

- There may well be medical words that have no literal translation. For example, there is no word for 'miscarriage' in Spanish. Some languages simply adapt the 'western' word. In others, you need to choose words or a phrase that describes what you need to say. There may be a local term that you can use. The editor could suggest local expressions to use.
- You can use the editor's notes to create a translation guide to ensure consistency and accuracy in the translation and to speed up the translation work.

- *Cold read by another native speaker* to check for errors and for any messages that have accidentally been repeated or omitted.
  - It can be useful to read the messages out loud. They should sound like someone speaking, not someone reading.
  - Remember that some local languages do not have a written form.
- *Pretest.* After the content review committee finalized the full set of content, select a subset of content to pretest (wording, tone and comprehension) to ensure acceptability and comprehension of the content.

A NOTE ABOUT TRANSLATION

Translators may use academic and complex language that most people in your target user groups either don't use or don't understand. It's helpful to use formative research to identify key technical vocabulary related to your social good area in local languages first, and then you may want to hire a professional script writer in the local language with experience of writing for your target population, who can write culturally appropriate content. You also want to test, test, test!

Key Lessons Learned Design & Develop - Content

- ❖ **Test it! Again and again and again with representative users**
- ❖ **Content should be the result of intensive collaboration.** You will need to work closely and from the start with your user group, technology partners and the

lead local implementer to ensure that your carefully crafted content reaches the right users, in the right format, in the right voice.

❖ **Consensus on content takes time, but it is vital** to have buy-in, input and approval from all those involved across partnerships in order to gain support. Think about other steps and work you can conduct in parallel to save time in the long run.

❖ **Use evidence-based core content,** and as you adapt and localize make sure you have the evidence or justification for the changes you make and document the changes made.

❖ **Investing in quality content is a key element of success**. However much you spend on the technology, if the content is not right, the end user will not learn from the chatbot and/or convert knowledge into action.

❖ **The power of a persona** – even though one of the main critiques of chatbots is that they are incapable of conveying emotions, carefully crafting and deploying a user persona for your chatbot may be a helpful tool to build an emotional connection and deeper engagement with your users.

Resources Design & Develop - Content

→ turn.io "Create Good Chat Service Content"

→ turn.io "Varying Interpretations of Emoji"

→ turn.io "Changing Behavior is Difficult! Here is some help!"

→ Breakthrough Action Research Meeting Youth Where They Are

→ Lessons learnt from applying a human-centred design process to develop one of the largest mobile health communication programmes in the world

Meta

Key Technical Considerations

What type of chatbot makes sense for your social good use case? Who are the key technical partners you may want to utilize and why? What is a conversational flow and how do you design one? What is a knowledge base for a chatbot?

While this playbook is not intended for chatbot developers specifically, nor does it have a deep technical focus, we do think it is important for anyone involved in developing, implementing or scaling a chatbot for social good to have a basic working understanding of some of the **relevant technical considerations** and a grasp of the **key terminology**.

As such, this section contains a basic overview of the different **types of chatbots** with some key considerations and examples, a brief description of **key technical partners** (BSPs and ISVs) with an overview of how to select the right one for you, an exercise on **designing conversational flow**, and a simple description of what a chatbot **knowledge base** is.

Types of chatbots

Chatbots are enabled by a large range of technologies and services at different levels of sophistication[139].

The right chatbot type is the one that best fits the **value proposition** (use case) you want to provide to your users. Is there a type of chatbot that could significantly impact this value? What are the related requirements in terms of **time and resources**? Do your team and/or partners have the **expertise and financing** to support these? Is it worth it?

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[139] https://link.springer.com/article/10.1007/s00607-021-01016-7

You also want to think through users' **UX preferences, literacy** and **digital literacy** - some may prefer to have the chatbot guide them with visual menu buttons rather than an open-ended experience where they're required to ask the chatbot questions directly. If users have low literacy, formulating questions can be challenging. Also, even if they are literate in their language, they may struggle to type their script on a smartphone and may not know the roman alphabet.

These considerations should be teased out in the formative research and through user testing of a beta chatbot, but the table below outlines basic types of chatbots with some relevant considerations.

Table 2. Overview of chatbot types with relevant considerations

Name[140]	Description	Use case or example	Cons	Pros
Menu/ button based Rule-based chatbots Task oriented Declarative Click bots	Most basic types of chatbots currently implemented in the market today. Guided by a decision tree, users are given a set of predefined options that lead to an answer. These decision trees may be presented to the user in the form of buttons and menus. These chatbots use conversational flows in which users can select an option and use if/ then logic. Generate automated responses to inquiries, but in a fairly structured and limited manner.	Chatbot that provides accessible answers to frequently asked questions (simple Q&A). Appointment and vaccination scheduling and reminders. Example - Dr. Joy chatbot in Korea for perinatal women's and their partners' obstetric and mental health care.	Highly dependent on user input - requires users make selections to dig deeper towards the ultimate answer. Cannot be completely reliable to get users' their desired answer(s) if user queries fall outside the predefined rules. Comparatively slower in terms of performance. Developers & conversational designers have to ensure that each permutation and combination of each question is well defined so the chatbot understands the user's input.	Are generally faster to train (less expensive) than chatbots that leverage AI. Can be easy to navigate for users with lower literacy and digital literacy (compared to open ended experience where users have to ask the chatbot questions directly). More accountable & secure than bots using AI (You can better guarantee the UX whereas chatbots that rely on machine learning can be less predictable). Easier to tweak and modify the rules vs with ML where it is more complicated and difficult to course-correct when things go wrong.

[140]Various names exist for similar chatbot types, and there are some inconsistencies in differentiation between types as this technology is evolving. As such, we group similar types of chatbots together as the descriptions, pros and cons are quite similar across the chatbot types grouped together.

∞ Meta

| AI Chatbots

Contextual

Natural Language Processing (NLP)

Machine Learning (ML) | AI Chatbots with artificial intelligence are able to conduct intelligent conversations with users, using natural human language, and understand the intent behind questions.

Advanced automated chatbots tend to use Machine Learning (ML), coupled with Natural Language Processing (NLP) within the domain of Artificial Intelligence (AI) to do this.

Voice recognition, speech-to-text conversion algorithms and more help interpret the user's sentiments and intentions and provide an answer by deciphering the pattern in the database.

These chatbots learn and grow over time as they accumulate more experiences (data). | Same use cases as above, as well as health counseling and education, health screening, risk stratification and referrals, self-care and personalized management and treatment of certain medical conditions in particular based on symptoms.

Example-MomConnect in South Africa[141] for health information, feedback, Q&A and hotline support.

Example- Data-driven risk stratification for preterm birth in Brazil[142] | More complicated, expensive

Data & privacy concerns may be more complex with these kinds of bots

Require lots of data, as well as data scientists to optimize

Require initial and on-going selection and tuning of a training set of phrases to give to the ML algorithm and to constantly improve the bot's performances. | Provide a more natural conversational user experience.

Can help manage language and literacy constraints but understanding words spelled incorrectly.

Can potentially reduce some of the barriers to engagement and outreach in a multilingual society.

Self-improve based on what users are asking for and how they are asking it.

Understand user behavior patterns.

Have a broader range of decision-making skills. |

It is common to see examples of **hybrid chatbot types**. For example, a chatbot that is both keyword recognition-based and menu/button-based provides users with the option to ask their questions directly or use the chatbot's menu buttons if the keyword recognition functionality is not providing the right answer or the user requires some guidance to find their answer.

★ For example, **Brazilian pregnancy information bot "Maria"**[143] was built on the rule-based concept, encouraging users to interact by clicking rather than text dialogues but also offered NPL with interaction via text.

Automated vs. Semi-Automated Chatbots

Semi-automated chatbots, as opposed to automated chatbots, have a clear **human component** as part of their design and functionality.

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[141] https://www.idinsight.org/article/using-ai-to-improve-maternal-health-chatbots-in-south-africa/
[142] https://www.sciencedirect.com/science/article/pii/S2667193X21000454
[143] https://www.sciencedirect.com/science/article/pii/S2772442522000296?via%3Dihub

∞ Meta

For example, a chatbot that provides health counseling on mental health should have a clear **pathway to a clinician** or frontline health worker for emergencies or additional needs of the patient. But a chatbot whose sole functionality is to assist with calculating a patient's BMI may not need such a strong human component.

No matter the chatbot use case and related design, users have to be able to clearly **get in touch with a human** able to answer questions about the information or services provided by the chatbot: directing conversations to human operators, providing a phone number, email address or web-support form or prompting a clinic appointment or visit. This is a **WhatsApp requirement.**

★ An example of this is a chatbot is **MomConnect in South Africa,** where key words or responses trigger additional interventions. If a user includes the word "bleeding" in their message, for example, the chatbot will either instruct them to visit their nearest clinic as soon as possible or put them in touch with a health-care facility. Additionally, if a user asks to speak to a real person or if they ask a question the system doesn't recognize, they're then routed to an actual human being, usually a trained nurse.[144]

★ Another example is a Chatbot for pregnant women on a **Posyandu Application in Indonesia.**[145] The decision tree above shows the pathways or flow to human escalation.

A key consideration as to what kind of human or escalation path you include is what the **costs** may be, how this would **function at scal**e and how to **transition to the government** if you plan on partnering with them at scale. For example, a link to a national hotline would be more cost-effective to scale as you acquire more users vs. providing a phone number for a physician or customer service type rep directly.

144
https://www.npr.org/sections/goatsandsoda/2023/04/14/1169988604/a-robot-answers-questions-about-health-its-creators-just-won-a-2-2-million-prize
145 https://www.mdpi.com/2227-9709/9/4/88

Technical partners

Many organizations working to launch, implement and scale chatbots for social good have cited a **lack of access to technical expertise** in areas such as data engineering and science, developer skills and conversational development as a key barrier to success.

Having skilled employees **(in house), contracting** or **partnering** with an organization (such as a BSP or ISV) with these skills was identified to be essential to the success of chatbot initiatives - in particular to the quality of the chatbot developed and its ability to be scaled and sustained.

Partnering with a BSP or an ISV[146]

Business Service Providers (BSPs) are third-party solution providers (typically marketing platforms or customer relationship management (CRM) solutions recognized by WhatsApp) with expertise on the WhatsApp Business Platform. BSPs often have their own chatbot platforms that use the WhatsApp Business Solutions API to have conversations with users over WhatsApp.

An ISV (independent software vendor) makes and sells software products that run on one or more computer hardware or operating system (OS) platforms. ISVs typically provide software in conjunction with a hardware, software or cloud platform provider. Examples include Amazon Web Services (AWS), Microsoft Azure and Salesforce AppExchange.[147]

There are currently 3 types of WhatsApp accounts:

> **1. Consumer App:** Individuals use it to message contacts, businesses via mobile phone or web.

> **2. Small Business App:** This is usually for small organizations that want to sell their products and services to users (max 100-500 users at a time).

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[146] Most nonprofits and governments looking to work with a chatbot for social good would benefit from NGOs benefit from partnering with senior digital people who understand digital technologies AND health issues AND communication AND business models and marketing - not just developers.
[147] https://www.techtarget.com/searchitchannel/definition/ISV#:~:text=An%20ISV%20

3. Business Platform (API)[148]: This is for medium and large organizations that want to communicate with thousands of users simultaneously. **Currently you can only access the API via an official business solution provider (BSP).**

The WhatsApp Business Platform[149] enables you to manage **high volumes of conversations** on WhatsApp. WhatsApp doesn't give access to all businesses and organizations. Well-established medium and large companies and organizations are particularly well suited to the API.

The WA business API **was scaled to 1,500 governments and NGOs**, largely as a result of Covid-19. Some organizations can access the WhatsApp Business Platform directly[150] but many work with a Business Solution Provider[151] to integrate on their behalf.

If you are not a developer, or would like to connect WhatsApp to your bot platform, you can **work with a BSP to manage communications** to and from customers. It is recommended you work with Meta's **authorized BSPs** for the approved use cases of customer support and time-sensitive, personalized notifications.

There are two types of WhatsApp Business Solution Providers:

1. **Marketing platforms** which allow organizations to access the functionalities of WhatsApp Business Platform inside their interface, meaning you can run a marketing campaign - or chatbot- directly through its interface.
   - Cost- *These platforms may charge an API setup or monthly fee, or allow you to pay only for conversations.*

2. **Connectors** integrate the WhatsApp Business Platform and other third-party marketing platforms. Connectors don't have any interface and are good for organizations looking to build a fully customized marketing -chatbot-infrastructure. This means you'd need a developer to set up the integration.

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[148] https://business.whatsapp.com/
[149] https://business.whatsapp.com/products/business-platform
[150] https://developers.facebook.com/docs/whatsapp/getting-started/signing-up
[151] https://www.facebook.com/business/partner-directory/search?solution_type=messaging&platforms=whatsapp

○ Cost- *Usually charge a monthly fee for using the WhatsApp Business Platform plus message fees according to the WhatsApp price list for user and business-initiated conversations.*

Why you may need a WhatsApp Business Solution Provider for your chatbot:[152]

- **For access the WhatsApp Business Platform (API)**[153] which is accessible only through partnering with third-party companies, namely WhatsApp Business Solution Providers.

- **Avoid coding skill requirements** - depending on the BSP, they may offer chatbot platforms which support design without need for coding skills, including dashboards for low-code updates of chatbot content and interaction design. Using an existing chatbot platform offered by a WhatsApp approved BSP would likely mean only configuration would be required to create the chatbot, rather than any 'building' code.

- **Easier interfacing** BSPs offer user-friendly interfaces for non-tech savvy organizations- for example you can use the WhatsApp marketing features through the provider's app interface.

- **Access to approved message templates**. To send promotional messages with WhatsApp, you must use message templates approved by Meta. BSPs can help you submit messages for approval.

- **Customer Relationship Management (CRM)** BSPs can often offer CRM features such as storing and managing your contacts inside a centralized solution.

- **Real-time, advanced data analytics** functionality, performance tracking, data visualization, and reporting.

- **By getting that green badge**, you can more easily go through the automated user verification process to get the green badge next to your organization or chatbot name on WhatsApp which signals to users that your account is official and has gone through a verification process.

- **Navigate legal and compliance considerations** - BSPs work through WhatsApp legal processes and compliance and make sure your chatbot adheres to the rules.

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[152] https://www.sendinblue.com/blog/whatsapp-partner/
[153] https://www.sendinblue.com/whatsapp-api/

What to consider when selecting a BSP

You will likely want to begin the BSP search process **early on**, ideally the conceptualization phase pre- formative research. As you can see via the Meta Partner directory[154], there are many WhatsApp Business Solution Providers. But how can you find one that **matches what your organization needs** in developing, implementing and scaling an impactful chatbot?

Here are some features, functions and characteristics to consider:

➔ **Pricing model:** What are the upfront and on-going costs to working with the BSP? How will costs evolve as you scale and sustain your user base? What are the fees for setup and licensing? What are the fees as your number of conversations grows? Given the WA pricing model for the health social good impact area (see sustainability below for details) you may want to look for BSPs with no subscription fees required to access WhatsApp campaigns, and instead go for one that offers a pay as you go for conversations only.

➔ **Local language and country experience:** Do you need the platform to offer the local languages and the BSP to have experience working in the country/ countries you plan to operate in?[155]

➔ **Which local BSPs have partnered with the government:** if there aren't any explore a domestic BSP as governments may want to avoid working with foreign companies due to spying, privacy and data protection concerns.

➔ **Experience working with social good cases, in particular health**

➔ **Experience partnering with governments:** if you plan to scale your chatbot to scale within your target geography you will need to partner with the government and working with a BSP who has a rapport and experience in doing so could be a major assistance.

➔ **Opt-in lists:** You will likely want to send messages to opt-in contacts, not just those who've added as a contact, and grow your opt-in list with integrated signup forms so look for BSPs with those features and functions, and make sure your users agree to the terms in the chatbot provider's privacy policy.

➔ **All-in-one platform:** The partner's solution should make it easy to create and submit templates for approval, import and verify contacts, schedule

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[154] https://www.facebook.com/business/partner-directory/search?solution_type=messaging&platforms=whatsapp

[155] Many countries will require chatbots to be locally cloud hosted because domestic privacy and data protection legislation will not allow data to be exported and hosted on a foreign cloud.

campaigns, etc. Seamless API makes the activation process easy and fast. No coding skills needed.

➔ **Embedded signup:** This means you're able to connect the WhatsApp Business Account (WABA) and access the messaging API functionality directly from the BSP's interface.

➔ **Clearly approved by Meta and in compliance with Meta rules and regulations**, experience in compliance GDPR and other data rules and regulations

➔ **Privacy and data protection**, where personal data will be hosted, who has access to it, liability etc.

Conversation Flow Diagram Exercise

It can be challenging to develop and visualize the flow and structure of the content which powers how your chatbot serves and engages with your users. Here is a little exercise to get the ball rolling!

Once you have your chatbot use case, chatbot type, key insights on user personas from your formative research and your topic map, you can begin to play around with your conversational flow diagram. This step can happen in parallel to your content development, adaptation and review processes.

The conversation flow diagram is **part of the architecture[156] behind what a chatbot does or says** - how it will answer questions, how it will retrieve information, what conditions it will take into consideration before answering, and how users will be guided to what they seek.

A chatbot conversation flow diagram consists of a **series of paths** that user questions and responses could trigger. Each of these paths has **nodes** that

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[156] The architecture of a chatbot includes many components such as the logic, user experience, cognition and intelligence, data ingestion, logging and monitoring, security and governance. https://www.ibm.com/cloud/architecture/architectures/cognitiveConversationDomain/reference-architecture

result in the display, request, processing of information or integration of your chatbot with third-party software.

Before you begin to design your conversational flow diagram, consider the following:

1) Agree on the **objectives** of the chatbot, based on your formative research

2) Decide **what type** of chatbot is required, depending on project objectives; the literacy and digital literacy levels of your users, and project timelines, budget and staff capabilities

3) Decide on the **format for navigational prompts** and **inputs** (voice, text)

4) Decide whether the chatbot will be **narrated** by an avatar

A helpful place to kick off the Conversation Flow Diagram Exercise is by **convening** the right members of your team, from your partnerships and the user group[157] (and ideally with key take-aways from formative research in hand!) to sketch out a rough flowchart or decision tree or diagram for the conversations you envision the chatbot will have, and how these will flow. You do not need to necessarily have all the content finalized and ready yet, rather a general purpose of the content/ message in mind.

You could **draw this out** with paper and pencil, a white board, or use an online interface like Canva or Miro. You could keep the overview general or get more detailed in coding/ specifying your nodes, depending on how much you already know about your chatbot design.

For example, you could use **color coding to depict nodes** commonly used to present information to the end-users (e.g., send Message (basic text and emoji messages), send Message with Options, send Image, Video, and Audio, custom Card - create your own custom code via HTML and CSS, etc.)

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[157] This would most likely consist of multiple co-creation exercises - one with team and partnership members and another with users (users) depending on the target population, because - for example - low literate low income women won't speak English, have limited mobility and are likely to be intimidated in a larger group.

Additional considerations for your conversational flow sketching exercise:

- **You likely won't want to create the entire chatbot flow in a single pathway** (although paths will likely be connected to one another). Creating separate paths for different scenarios will make it easier to understand and edit your flows.[158]

- **What is the chatbot's greeting?** Do you have a common greeting message or does this vary for new and returning users? What about for the very first time users initiate a conversation?

- **How will you end the chatbot flow** that makes sure your users are satisfied, heard, appreciated?

- **What will your repair sentences/ follow-up messages and questions say** (when the chatbot doesn't understand) and when will they be triggered?

- **Will you connect users to a human element?** How?
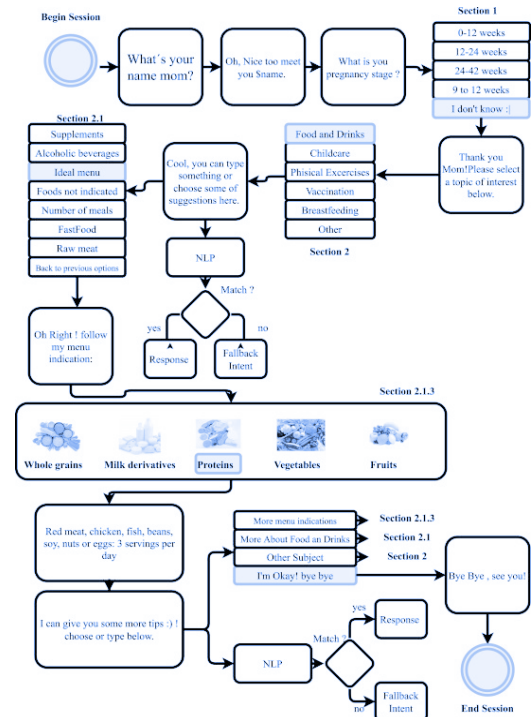
Once this sketch is complete, you can replicate it on a **visual flow builder** (such as Visio)- your BSP will likely provide this- and put in draft messages in the various nodes and refine. Having the skills in house to use Visio can be very helpful.

Building a Knowledge Base

Chatbots are designed to recognize a user's general intent, but how do they know which specific information to provide? A knowledge base provides the chatbot with the **information it needs to accurately respond to users** – it is the

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158 https://www.sciencedirect.com/science/article/pii/S2772442522000296?via%3Dihub

Meta

content, information or data the chatbot refers to in order to generate a response, and usually contains keywords and phrases with linked replies.

For chatbots to obtain knowledge, they need to **extract data from various sources** and **store it** in this knowledge base. Chatbots don't just pull information out of thin air - they need to be taught what to say, how and when to say it. Knowledge bases can either be **open-domain** or **closed-domain**.

Closed-domain knowledge bases

- Chatbots with a closed-domain knowledge base **focus on a specific area** and usually help users **accomplish a task**, such as asking a question or scheduling an appointment.
- **Button-based and rules-based** chatbots likely leverage a closed-domain knowledge base.
- This knowledge base could be a **structured excel spreadsheet** - think a refined and reformatted version of our topic map. This structured excel file will likely be provided by the chatbot developer and/or your BSP.

Open-domain knowledge bases

- Leverage **broad unrestricted knowledge** and are generally conversational agents, capable of responding to a variety of user inputs.
- Chatbots that **leverage AI**, whether NLP or ML, or chatbots that are a hybrid of a more simple chatbot together with one of these, likely have an open-domain knowledge base and use a **Natural Language Understanding** or an **inference engine** (which draws conclusions based on knowledge).

**Questions to consider in getting started with your knowledge base:[159]**

➔ **Did you or will you build on** existing infrastructure, use an enterprise platform, or develop a stand-alone chatbot? If so, inquire about support and templates

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[159] https://kmslh.com/blog/whats-the-best-way-to-build-a-chatbot-for-a-knowledge-base/

offered for building your knowledge base.

→ **Where will you pull the information/ data** that underpins your messages/ content from? Will you develop your own knowledge base or link to an existing one? Will you cull from existing databases and then adapt?

→ **Where and how will you store and organize** this information/ data?

→ **Who on your team will be responsible for this?** Initially? For over time maintenance?

→ **Do you need to consider outsourcing** knowledge-based chatbot development and/or maintenance to a third party, or does your team have the expertise to build and maintain this?
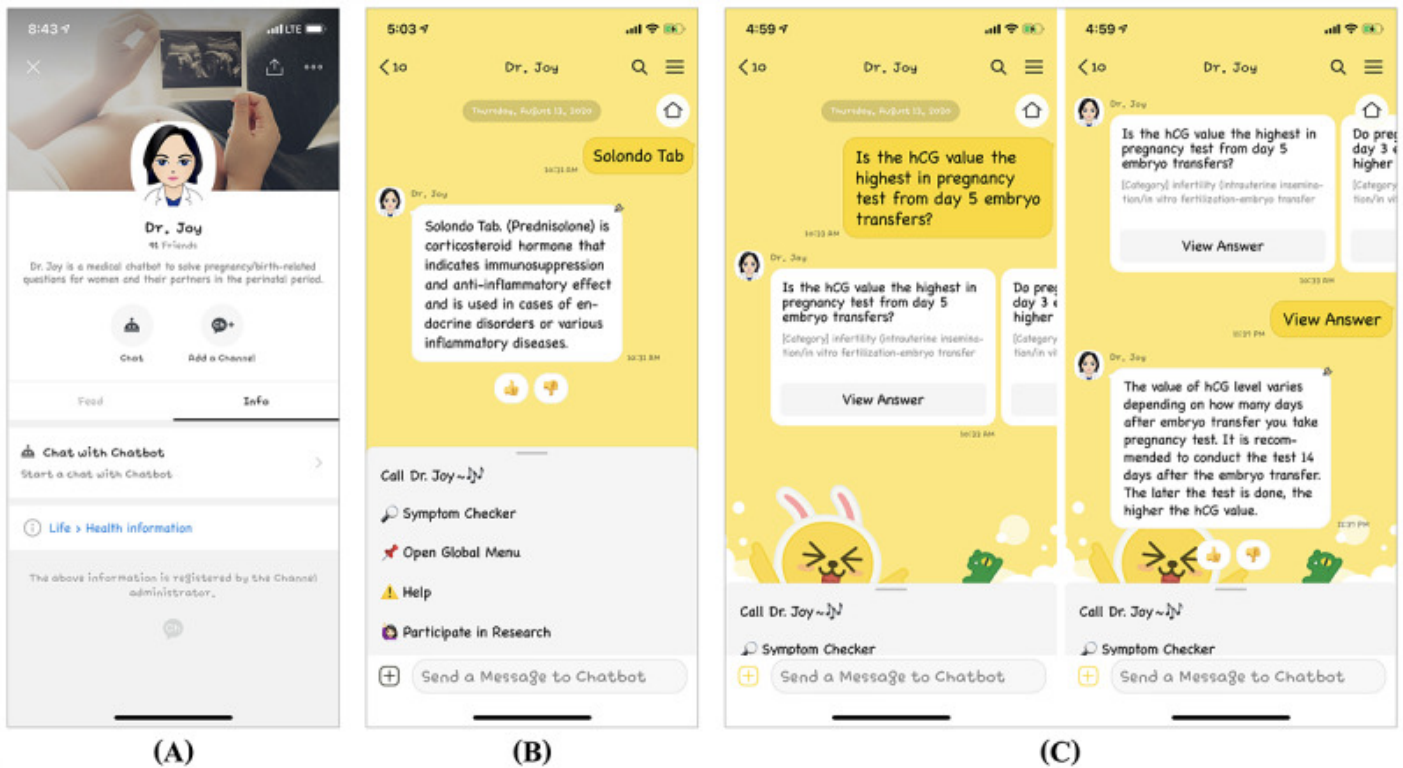
Box 5. Example of how developers built a knowledge base in Korea for a Q&A chatbot Dr. Joy.[160]

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[160] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7970298/

★ For example, **Korean MNCH Chatbot Dr. Joy's** main feature is to answer user queries and frequently asked questions, which works by searching for questions similar to users' dialog input in the stored Q&A knowledge database and then outputting answers linked to those questions.

To build this, developers:

1. **Used a web crawler,** written in in Python to crawl posts on message boards on one of South Korea's largest online communities for prenatal, postnatal, and maternal care

2. **Parsed content** retrieved by the web crawler was converted into an Excel spreadsheet file by topic, stored, and then refined to remove redundancies.

3. **Extracted medical questions** from the title and body content of the posts, which were refined as simple, conversational questions or statements that one might ask a chatbot.

4. **Recruited doctors** to identify and revise inappropriate questions or statements with false terms or without user intent and contextual information, and answered all questions with a consistent tone and manner.

5. **Cross-checked the Q&A** pairs involved in their specialty, and categorized the sets.

Key Lessons Learned: Tech Considerations

❖ **Know when to link chatbot users to a human.** It is both a requirement of WhatsApp policy but also a key way to serve your users to know when to link them to a clear human component as part of chatbot design and functionality. However, this can be quite expensive and tricky to scale and transition to government.

❖ **Content coverage of your knowledge base can significantly impact the quality** of the content and perceived usefulness of your chatbot, so prioritize these areas.[161]

❖ **Creating an interactive visual map of how content or decisions made by your chatbot** will flow (also known as a chatbot conversation flow diagram - it's the blueprint used by engineers to configure/build the chatbot) can make this somewhat confusing web of pathways more concrete.

❖ **Knowledge domains are somewhat like your chatbot's brain.** Depending on what your use case is, your chatbot will have a bigger brain (requiring more time, resources, training, etc) or a smaller, simpler, closed brain for more limited and concrete tasks and Q&A.

❖ **Your Business Service Provider (BSP) may be able to provide technical assistance and templates** for both designing your conversational flows and building a knowledge base. If you will need assistance in these areas, consider including them as you vet potential technical partners.

Resources: Tech Considerations

➔ Turn.io Human Escalation Path Required

➔ Facebook BSP Directory

➔ Chatbot Architecture, Design and Development

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[161] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7970298/

Conclusion

We conclude this playbook by stressing that there should be no conclusion to the virtuous cycle of learning, sharing knowledge, and best practices for developing, implementing and scaling impactful chatbots for social good.

This field is rapidly growing, and it is our hope that this playbook grows with it. In this vein, we warmly welcome input, additions, questions and comments to help us keep this resource alive and up-to-date.

Please get in touch with us - info@katicollective.com .