PAN-EU PANDEMIC INFORMING, EDUCATING AND TRACKING CHATBOT SYSTEM FOR COVID19 AND BEYOND
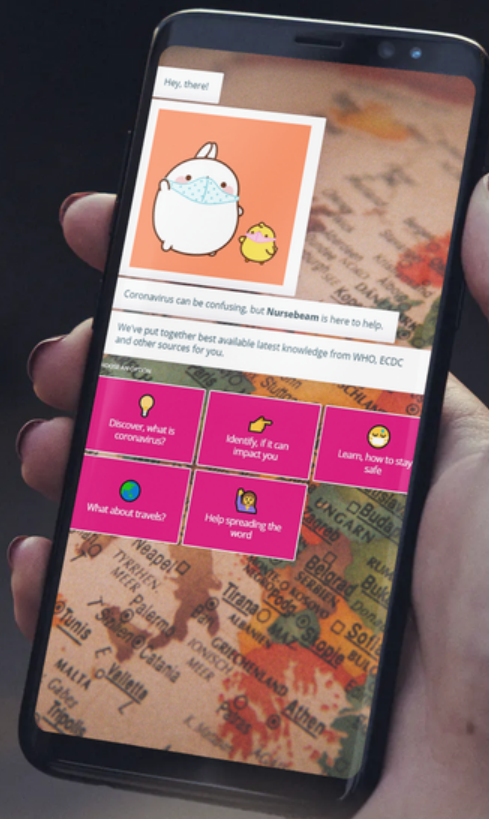
EUROPEAN OPEN SCIENCE CLOUD

EOSC SUPPORTED COVID-19 PREVENTION ACTIVITY

REPORT BY NURSEBEAM

EXTENDED INSIGHTS EDITION

ACCESS BOTS AT DEDICATED ACTIVITY PAGE NURSEBEAM.COM/COVID19

THE CHALLENGE

During the emergence of COVID19 in early 2020, the biggest challenge was how to share information effectively between various communities across the countries.

While the available scientific information was being shared openly in the international scientific community. There were often more questions than answers, some of which have remained without a concrete answer until today.

Furthermore, people in their everyday lives have to make practical decisions – how to interact with other people at home, workplaces, schools and other public spaces.

Key to curbing the spread of infections, especially in the times of pandemic, is **early detection and early response**, which is only possible when people are informed and educated in the language they understand.

Thus the challenge to combat COVID19 is to find the right way to talk, for people to follow your walk.

It is not only a matter of language as such, English, French or German, per se, but to also we need to consider that different groups of people – clinical scientists, medical doctors, politicians and the general public – might not understand each other due to complexity of the words used.
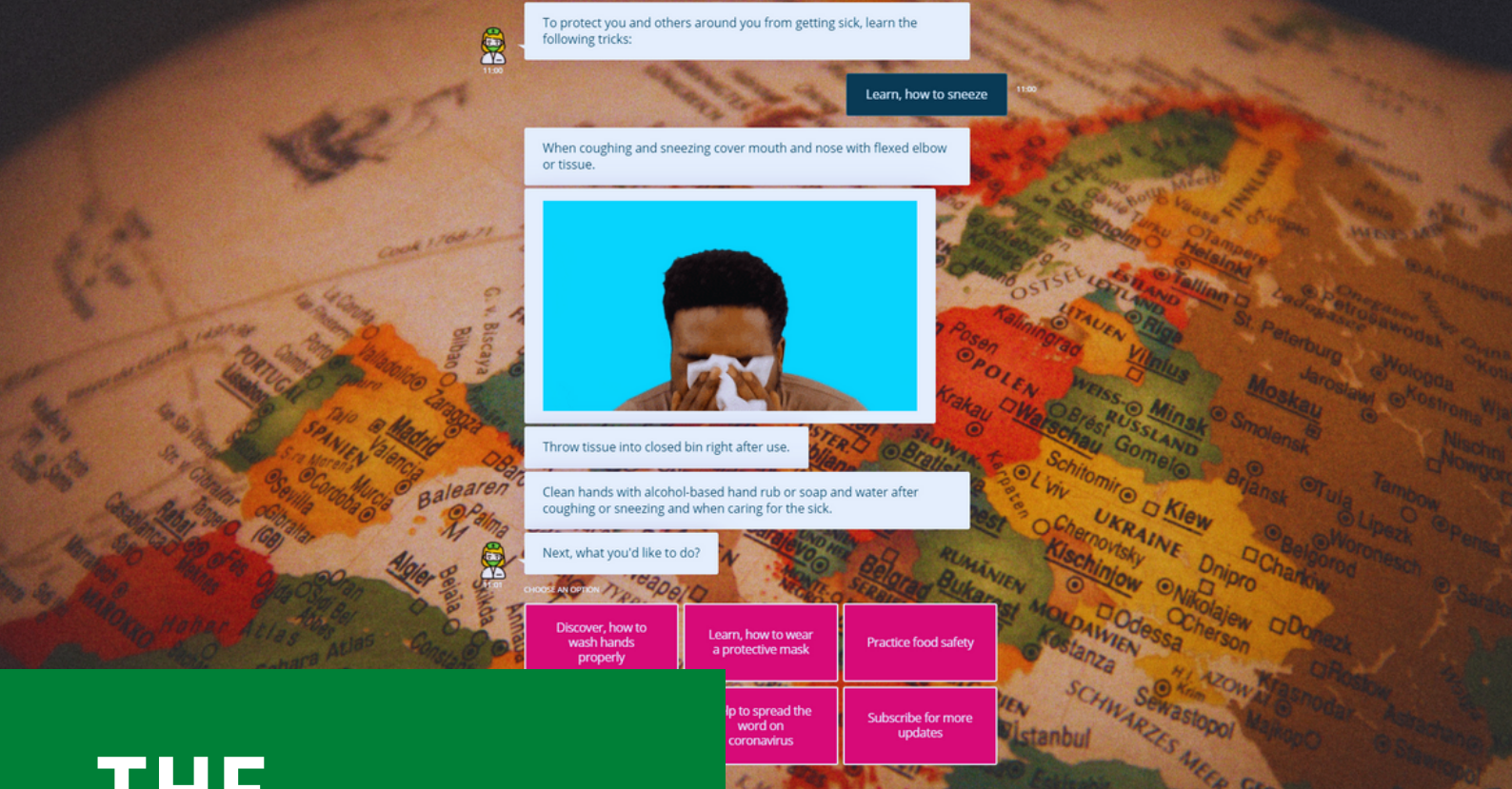
THE SOLUTION

One of the best ways for educating people is making information available in a consistent, bite-sized easy to understand format in the medium most frequently used by the target audience.

While researchers are used to reading long pdf documents, most of the general public has been actively using instant messaging solutions, incl. WhatsApp, Telegram, Signal, Facebook Messenger and others.

Chatbots enable communicating with many people in a familiar instant messaging format via short, easy-to-understand messages. In the right language and 24/7 without any wait.

Furthermore, differently from pdf communications, which seems to be the preferred medium for the scientific community and many government agencies, chatbots can be fully interactive, utilizing also audio/video clips as part of communication flow.

We built chatbot to educate people across the EU on COVID19.

Going beyond the standard guidelines from WHO, ECDC and national governments, we compiled the essential information in different EU languages into an interactive chatbot, to guide EU citizens, residents and visitors in taking the best prevention and preparedness measures for COVID19.

MAIN TAKEAWAYS

Upon getting closer to vaccine roll-out, vaccine-related topics came to focus and they are still a topic of discussion to this date.

While learning self-protection was important, chats revealed the biggest curiosity on ever-changing restrictions.

After deploying our COVID19 chatbot, what did we find? What were Europeans curious about in the COVID19 context? Initially, the bot was offering guidance on:

- Discovering what is COVID19
- Identifying if it can impact you
- Learning how to wash hands
- Learning how to wear a mask
- Learning how to sneeze
- Learning food safety measures
- Learning social distancing

During the summer months as certain intra-EU travel options opened up and bot added travel restrictions as a topic as well, which turned out to be very popular.

Considering that restrictions are still ongoing as of early 2021 and that Europeans are not fully vaccinated yet, it is essential to keep on informing and educating.

For this, we see the need of extending the chatbot activity with extra financing at least until Dec 2022.

WHAT ARE THE RESTRICTIONS?

EU states have been implementing different COVID19 measures, including travel restrictions. While there is https://reopen.europa.eu website, users prefer chatbot interface to understand them.

78% users were interested in current intra-EU cross-border travel restrictions

61% of users in December were curious to find more on soon to be rolled out COVID19 vaccines

WHAT ABOUT VACCINES?

Are vaccines safe? Which one to prefer? Where to get vaccinated? Does vaccine give full protection against COVID19? Do I need to vaccinate if I had COVID19 already?

DOES MASK MATTER?

... has been a heated question in many EU states. For some, it has been a political question, in the context of human rights, medically it is very relevant to curb the spread of infection.

27% chatbot users wanted to know more on mask wearing related information

ENGINEERING FOR FUTURE

COVID19 type pandemic showed how ill-prepared the EU, as well as the member states, were for this scale of public health threat. Yet, this should not have been an unexpected surprise. "A World at Risk: Annual report on global preparedness for health emergencies 2019" by Global Preparedness Monitoring Board pointed out **"For too long, we have allowed a cycle of panic and neglect when it comes to pandemics: we ramp up efforts when there is a serious threat, then quickly forget about them when the threat subsides. It is well past time to act."**

Keeping this in mind, we can be prepared much better for the next public health emergencies.

Using already available technologies, we can build active response systems and keep them on standby for the next possible emergency. The EU and national governments have their risk assessments plans already, now it is time to build scaleable response systems to address those risks.

Chatbots can be pre-defined and quickly deployed, to serve people in the EU at scale during public emergencies.

This way, in the next emerging pandemic, public health authorities can just quickly customise and then activate appropriate chatbots. This cost-effective way would provide clear and consistent information to all required target groups.

FRAMEWORK FOR EFFECTIVE AND SCALEABLE HEALTH EMERGENCIES COMMUNICATION

6

steps to get prepared for the next possible public health emergency

This 6-step guide is created to help decision-makers in the EU and national states to plan and prepare for the next public health health emergency.

Step 1: Map all possible public health risks that could impact your community
// Look into already existing national, regional and local risk assessment plans to get the required input. Also, consider future threats listed in climate change research.

Step 2: Shortlist the risks with the biggest disruption potential
// While different emergencies can happen, it is essential to respond early to risks, which can scale quickly and grow from local to regional, national and cross-border emergency.

Step 3: Identify, what kind of information the public would seek in that type of emergencies
// Consider different stakeholder groups and their sensitive needs. For example, the needs of parents are different from young or elderly community members. Schools might require different information than businesses; the needs of office managers might differ from the needs of transportation or grocery workers.

Step 4: Create unified communication templates for different communication channels
// Templates make responding easy in the case of need. To be effective, they have to be responsive to the context and have an option to incorporate feedback from affected groups. Differently from radio, TV, newspaper or mere online post communications, chatbots can incorporate integrated analytics and feedback systems. Also, templates can be prepared in all relevant languages, in the EU, the best is if in all official EU languages.

Step 5: Appoint and train person(s), who would customise and activate the communication templates in the case of emergency
// This is helping to be ready for communication deployment, including public health emergencies chatbot deployment at already the early stage of emergency.

Step 6: Be ready for re-adjusting your communication, including chatbots, based on feedback from affected groups.
// The information needs are likely to change during the course of an ongoing public health emergency. Thus, it is important to consider the feedback from affected community groups and re-adjust your communication messages to fully meet their needs.

ROAD AHEAD

While in early 2020 we expected COVID19 to be over by the end of the year, then now, a year later we still see that it's a long road ahead. We have millions of Europeans waiting to be vaccinated. Various restrictions to be lifted, including for intra-European travel as well as with 3rd countries.

Full transition to post-pandemic life likely takes at least another year. For this, Nursebeam is looking forward to continued co-operation with the EOSC community, EIT Health community and other EU healthtech innovators to inform and educate the public on the latest COVID19 related guidelines and regulations.

In 2021/2022 it still essential to help people in the EU to navigate COVID19 related health and regulatory guidelines. Looking ahead, however, we need to build robust digital healthcare systems, to provide scaleable care across the member states.

At Nursebeam we believe in borderless digital healthcare, in the EU and beyond.

Are you curious to collaborate for building better healthcare communications? Reach us at hello@nursebeam.com and discover more about us at our website https://nursebeam.com

Extended Insights

Guiding Concepts, Data Sources and Methodology for Engineering Communications

We wanted to communicate to people the impacts of COVID19 and the ways to stay healthy in an interactive way, regardless of the European Union language they are speaking.

To make it happen, we needed to fulfil two conditions:
- Be based on up-to-date, relevant and medically sound information, sourced on official advisory guidelines of WHO, ECDC and national EU health authorities.
- Design and implement an interactive and engaging, scalable tech solution, which would be available 24/7.

The sources for obtaining the latest medical content, active public health measures and statistical information on COVID19 we used were:
- World Health Organisation COVID19 pages at https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- European Centre for Disease Prevention and Control COVID19 pages at https://www.ecdc.europa.eu/en/covid-19
- Re-open EU information regarding nationally imposed COVID19 measures at different EU members states at https://reopen.europa.eu/en

The sources of engineering design for implementation:
- GIPHY library at https://giphy.com for interactive GIF-format visualisations.
- YouTube library at http://youtube.com for video instructions implementations.
- Canva library at https://canva.com for other visual designs.

The source for translation of chatbot dialogues:
- Google Translate at https://translate.google.com and its integrated function within GoogleSheets

Using the data sources above, the chatbot's content was designed in English and thereafter translated into 23 other languages: Bulgarian, Croatian, Czech, Danish, Dutch, Estonian, Finnish, French, German, Greek, Hungarian, Irish, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish and Swedish.

The data sources were reviewed for possible content updates on a daily basis, including possible updated medical guidelines as well as daily updates on infection rates and 14-day notification rate of new COVID-19 cases and deaths.
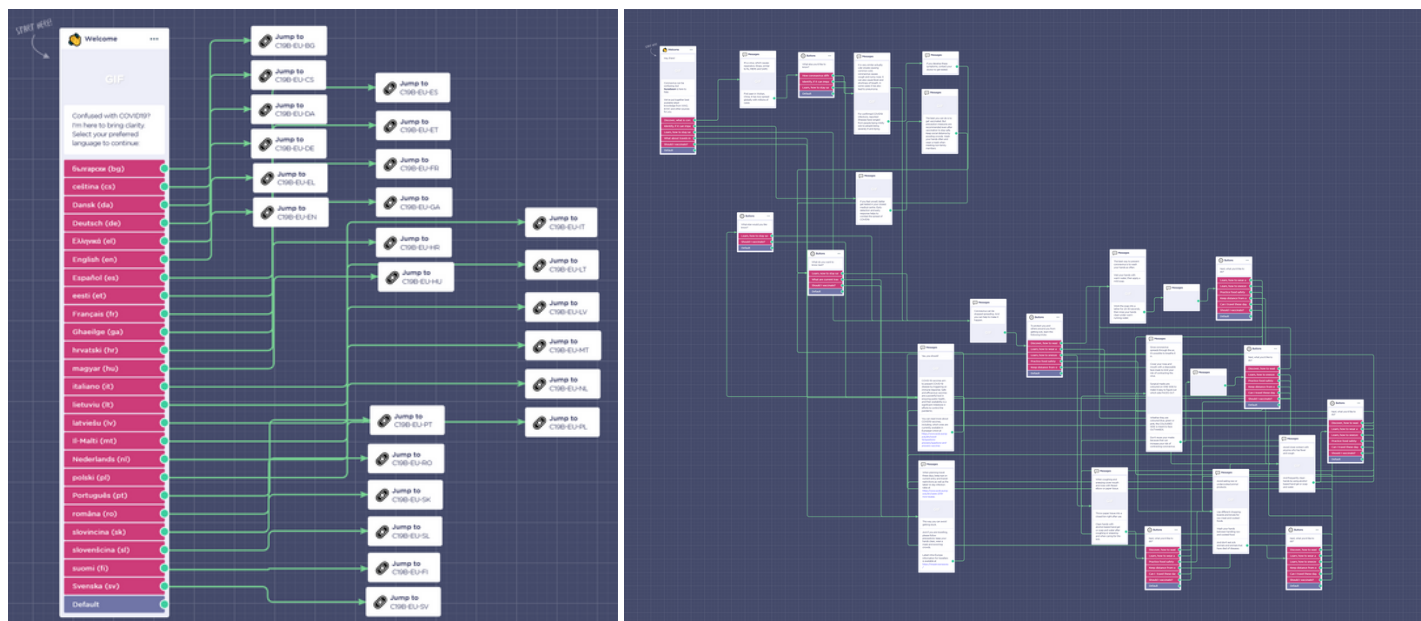
Extended Insights

Implementation of Software and Deployment Challenges

The activity chatbots were created using the Landbot chatbot building platform (https://landbot.io). It is a product of Spanish start-up Hello Umi, which enables rapid development of chatbots based on visual composer and integrations with 3rd party services, including full-page embedding into websites.

Differently from other available chatbot building platforms, Landbot offers extended customisation of the visual design of the chatbot, enabling to tailor the end-user experience only engaging in terms of content, but also visual design.

Initially, the bots were designed to work on one universal flow canvas, where the content and its language could be variable-controlled within Landbot and source data provided via GoogleSheets integration. This enabled also applying automatic GoogleTranslate function within GoogleSheets using GOOGLETRANSLATE(text, [source_language, target_language]) syntax. The daily updates of COVID19 statistics would be manually updated in GoogleSheets based on ECDC information.

However, due to limited performance of this API integration at times, at later stage this approach had to be abandoned and instead 1+24 conversation flow canvases were created within Landbot: One start-flow of the chatbot, where the end-user would be greeted and then offered a language selection of the following dialogue. Depending on the selected language, a sub-bot in that specific language would be activated using "Jump-To" function in the backend. For end-user, however, it would feel like one streamlined experience.

Extended Insights

As separate standalone files, we have made exported final versions of the start-flow canvas as well as 24 language-specific flow canvases in PNG format, for public use.

The chatbots created on the Landbot platform were made public on the https://nursebeam.app server using full-page embedding.

Extra remark on source data updates. While in theory the daily and 14-day statistical feeds could likely be automated using different integration schema, the conversation flow on the information of national measures as well as medical guidelines are the type of content, which should be frequently curated and revised by professionals and that is labour-intensive, analytical work and requires human intervention.

Due to this limitation, at the end of the activity, the bots had to be redesigned into more limited functionality and instead of providing more latest content via handover content links to ECDC and Re-Open EU rather than providing their content within the bot directly.

In case follow-up funding would be provided for the next term, also wider in-bot information capabilities could be restored and extended.

Openness

The chatbots created during the activity have been and still are freely accessible at Nursebeam COVID19 page at https://nursebeam.com/covid19 and direct link at https://nursebeam.app/covid19

You can use it in any of 24 official languages of the European Union (Bulgarian, Croatian, Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Irish, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish, Swedish).

While the source code of the chatbot can not be directly downloaded due to limitations of the used production environment (Landbot), where only bot design flows can be exported as PNG files. Thus, we have shared the latest bot flow schemes in PNG format at the Zenodo depository. This enables interested parties to re-create the bots in the same or similar chatbot building environment.

Extended Insights

Sustained use requirements and recommendations

Due to using paid chatbot hosting environment and servers, the chatbots are currently secured to be available until 29 Sep 2021. Extending their free availability for public use can be extended upon extended follow-up financing. Considering still ongoing COVID19 pandemic, Nursebeam is encouraging EOSC and the EU to consider providing follow up financing to enable the chatbots to be updated and remain available until 31 Dec 2022, by which time hopefully COVID19 is no longer an active public health threat in the EU.

Further potential uses of the tool

Implemented chatbots at https://nursebeam.app/covid19 could be used by any public or private parties within the European Union, who wish to provide COVID19 information in all 24 European Union languages (and possibly other additional languages in the future) to their customers or visitors.
Using one multi-lingual and centrally updated tool is more cost-effective than creating, implementing and updating individual information pages at different public agencies, offices, transportation hubs, hotels, dining and entertainment venues across the European Union.

The easiest way would be creating easy-to-scan QR codes, placed visibly at those public venues, which would re-direct people to the chatbot interface. If implemented jointly with travel industry players across the European Union, this solution could be part of restoring not only intra-EU tourism, but also provide information and assistance for 3rd country arrivals. For example, in the future it could be also translated to Arabic, Turkish, Russian, Chinese, Japanese, Korean, Ukrainian and other languages, which are frequently spoken by the visitors to the EU or EU residents, whose mother tongue is different from the official languages of the EU.