

European cities' first steps with chatbots

THE NEXT STEP IN DIGITAL CUSTOMER SERVICE?

The online interaction with citizens is growing, especially Facebook Messenger, WhatsApp and Live chat. Webcare is well organized now, which wasn't the case ten years ago with earlier live chat experiments. The interaction is also completely digital.

In this paper we introduce two important requirements of chatbots. We answer questions like:

- 'What are the possibilities of chatbots?'
- 'What are the benefits?'
- 'What's the impact of chatbots on organizations?'
- 'How to start with chatbots? and
- 'What are the lessons of the first pilots?'



City of Rotterdam



Aalborg
Kommune



Angus
Council



ROESELARE
IS 'R VOOR JOU



Innovation
Culture
Approach



Smart
Devices



Digital
Devices

About LIKE!

Local governments, citizens, universities and SMEs come together to co-create smarter, more efficient and more innovative services through 9 transnational pilots that cover 3 core themes.

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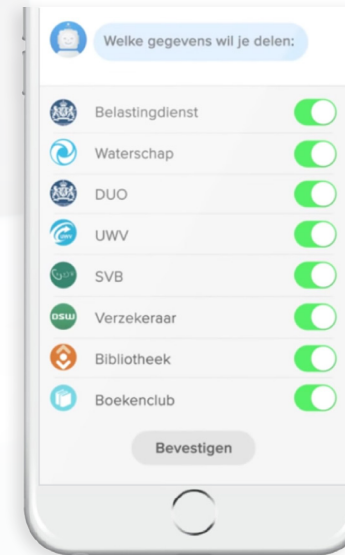
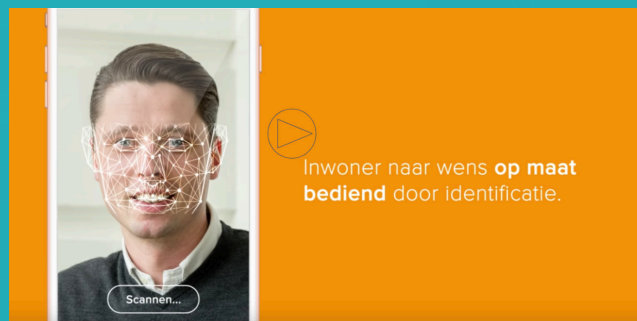
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WHAT'S A CHATBOT?

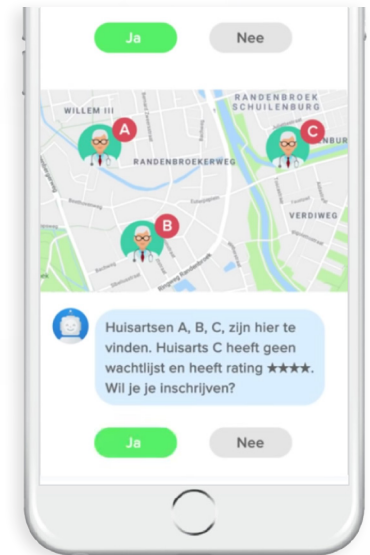
A chatbot is a robot that provides fully automated chat conversations. Well known chat channels are WhatsApp, live chat or a messaging tool like Facebook Messenger. A user/citizen types messages and questions in a dialogue frame on a website or in a chat app.

The chatbot analyses the messages or questions and answers or starts a transaction. Instead of calling or surfing on a website, the citizen can chat like he/she is using WhatsApp with friends. It's not a human that's replying, it's the chatbot. The chatbots use artificial intelligence (AI) for formulating the answers to users' queries.

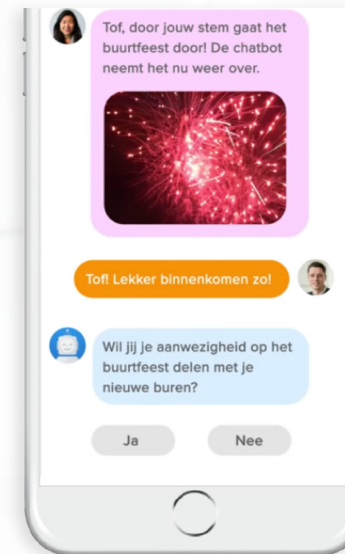
To get to a nice example of how a chatbot works, [look at Front Office 2020 here on YouTube](#) [in Dutch]. The person is moving to a new house with his family and his company. Their public services are moving with them. By using big data, they are informed about a doctor nearby and by using participation processes and online groups, they are introduced to the neighbourhood party.



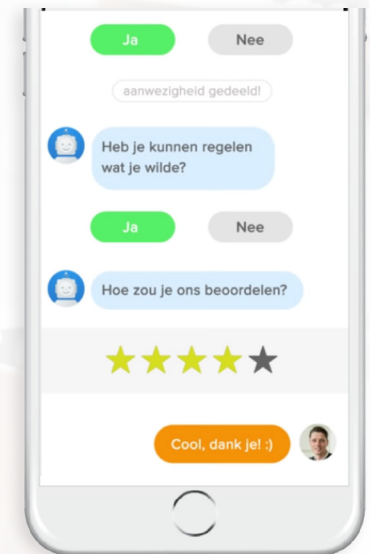
Buttons to interact



Use of maps



Hybride interaction



Ranking service

TWO TYPES OF CHATBOTS

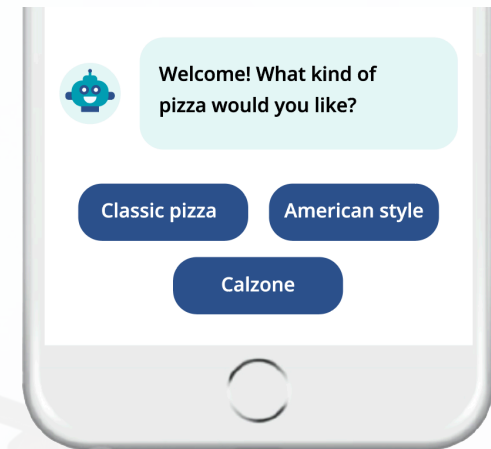
At the moment two types of chatbots are used: **scripted** chatbots and **conversational** chatbots. *Scripted chatbots* use less intelligent dialogues.

The questions and answers are to a large extent predefined. If a citizen asks question A, the next step for the chatbot is to give answer B etc. To trigger a transaction, the chatbot asks X, Y and Z. It's more like filling in an electronic form like dialogue boxes on websites.

For example, to order your favourite pizza by using WhatsApp, the chatbot will ask you what kind of pizza you like, what size, which toppings and what your address is. The chatbot is searching for the so called '**intents**' of the citizen, to distinguish between the relevant answers and the not so relevant words in the dialogue. The scripted chatbot uses answer buttons within the dialogue to get quickly and accurately to answers.

The *conversational chatbots* search for intents and (most probably) answers by using a lot of AI. The chatbots use machine learning and natural language processing to learn and get better in answering in the right, natural way and with the right answers.

Bjorn Dirkse [Rotterdam]: "The artificial intelligence isn't fantastic yet. Identification and authentication techniques are possible but not allowed yet (like face recognition, voice recognition and two-way authentication). In case of a government using Voice technology, privacy can be an issue too."



Example of scripted chatbot

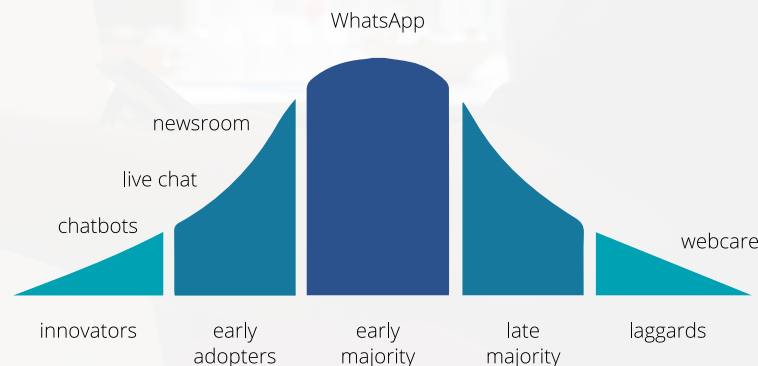


Example of conversational chatbot

Innovation for government organizations

To put things into perspective, in the Like! Partners' local government chatbots are at the 'innovator stage'. Some organizations are investigating the possibilities and impact of chatbots. With additional budget, real innovative pilots can take place. Most of them are currently scripted chatbots because the AI and natural language processing isn't far enough developed in Dutch, French or Danish. Developing AI and natural language processing was the hardest part in experiments with conversational chatbots so far.

To compare, in the Netherlands +80% of local government organized webcare 50% uses WhatsApp as a service channel and 20% uses Live chat and implemented a newsroom. In Belgium approximately 20% organized webcare so far. Chatbots are touted to be the next wave in digital customer service.




Chatbots vs robots

There is another type of chatbot which isn't a real chatbot, but more a kind of robot. Within webcare – the customer service centre of an organisation - tools are becoming available to make the work of a webcare worker easier. Tasks like labelling messages (like 'compliment' or 'complaint'), completing messages, filtering likes, etc are done automatically instead of doing it manually. The development of a so-called Robotic Process Automation (RPA) at the moment - also in webcare processes - is developing in parallel of chatbots, but the concepts of chatbots and RPA must not be confused.

Chatbots vs voice

Another related trend is voice as a communication channel. Pushed by Amazon with Alexa, Google with Home and Apple with Siri, the intelligent speakers are entering our living rooms. Voice is just another interface in front of chatbot technology that we are discussing in this paper. Instead of typing into a chat frame or in WhatsApp, speaking and listening to the speaker is the interface. The intelligence behind voice is the same as for chatbots. Of course interface specific skills like listening and speaking are extra. The development of chatbot tools and platforms contain also skills and tools for Voice. If you take the step with chatbots, you almost take the bridge to voice!



City of Rotterdam, The Netherlands: ten experiments with Voice

Bjorn Dirkse, b.dirkse@rotterdam.nl, innovation team public service

The city of Rotterdam investigated the meaning of Voice for future public service, together with the Hogeschool Rotterdam (Academy). They worked on several cool ideas and tests

- a chatbot in a reception column in the townhall to see if extra security is needed based on recognized emotions,
- a chatbot for the notification of noise disturbance including the match with known events and road maintenance project
- a chatbot for young adults with debts including some gamification.

One of the other results are the city's experience with the way of working with sprints and prototyping. The colleagues and board members got spontaneously very enthusiastic about the possibilities of chatbots.

Important lessons are:

- making public services more accessible:
 - visually impaired;
 - people who can't read or write;

- immigrants/non-native speakers;
- people with autism;
- people with a learning disability.
- are able to help themselves better online or at the town hall by the use of chatbots of Voice
- more human-like and personal service by the use of natural language: it's more fun, it's feels more warm
- chatbots and Voice can make public service more location independent
- maybe the opportunity for multi-language public services

Next steps are a real Proof of Concept (PoC) with Voice for a simple product or process like making an appointment (because you don't need to identify yourself for such a service). The city started also a market consultation.

BETTER SERVICE WITH CHATBOTS

What are the benefits of using chatbots? Experience of chatbots in local government is a relatively new concept, whereas implementations within commercial organizations tend to show the benefits of chatbots more convincingly.

Using the channels citizens use, 24/7

Government organizations look at the channels that citizens use in their everyday lives in order to optimize local government services, communications and customer service experiences. For example, local government organisations noticed in the early 2000s that people were increasingly using website to get information and undertake transactions, and subsequently followed suit with their own service

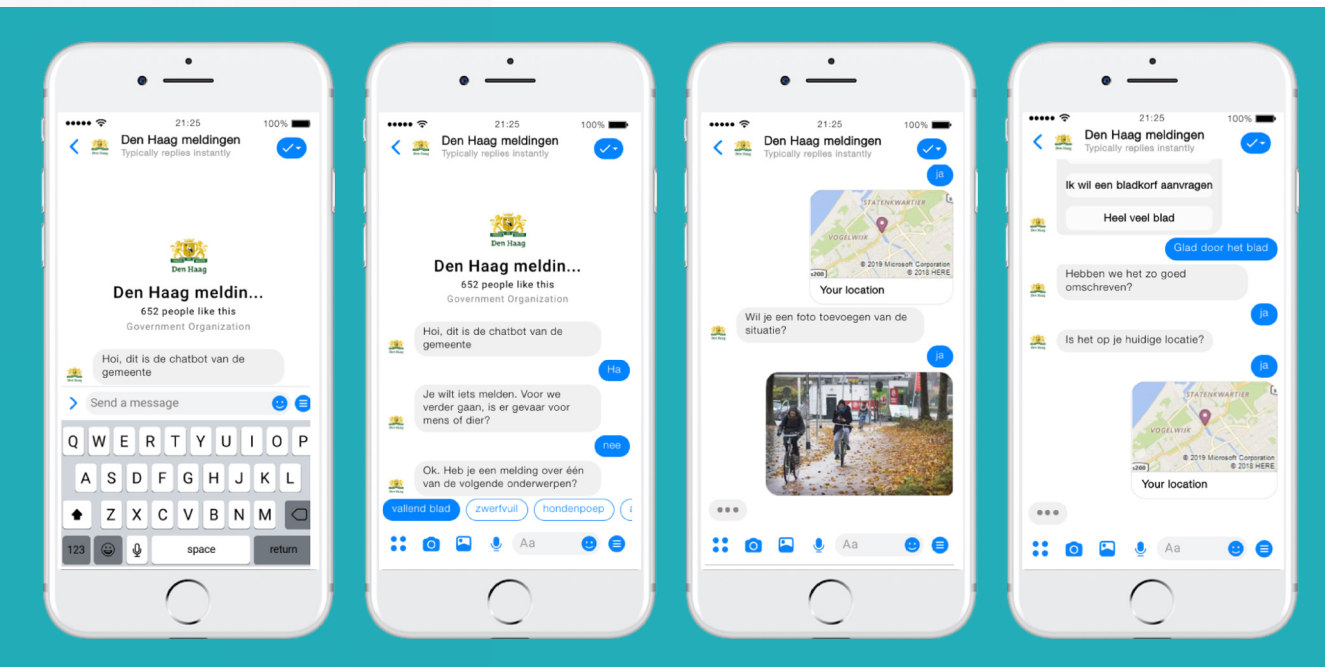
offerings. Similarly, around 2011, the use of Twitter, Facebook and other Web 2.0 apps led to a change in the way local government interacted with the public. Now, as we approach the dawn of the 2020s, we see that the public are increasingly using chatbots, WhatsApp and live chat in their day to day lives, local government will need to play catch-up and revise its service offerings to match customer expectations.

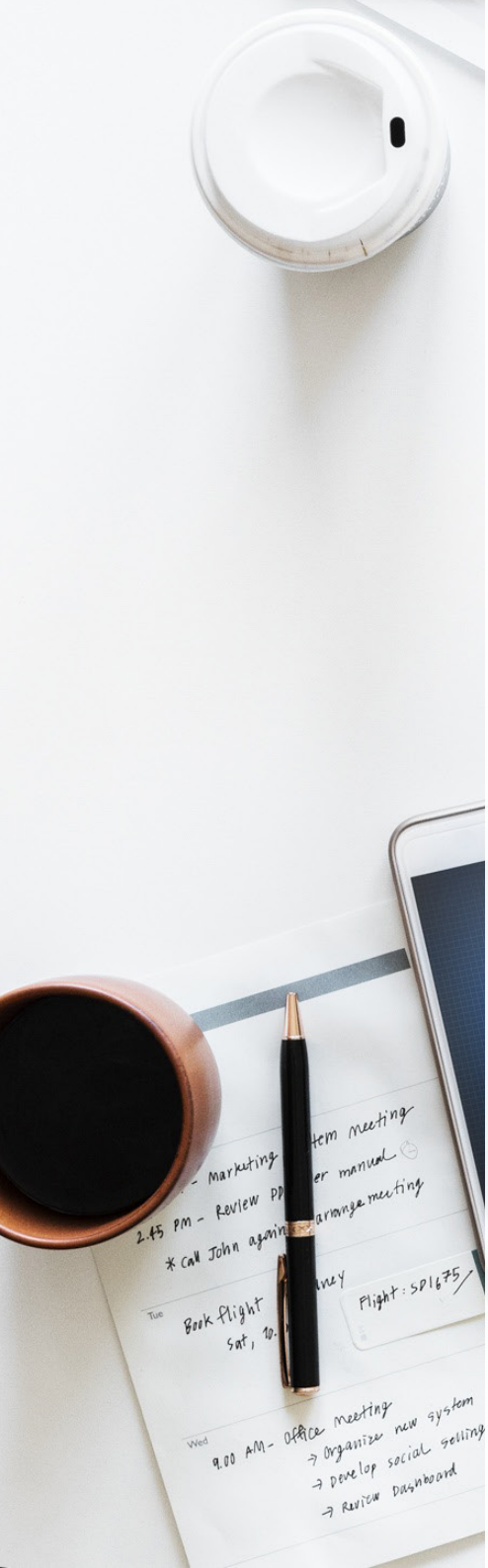
Just as with Web 1.0 technologies, chat and chatbots are available 24/7. The chatbot will improve on website self-service - the chatbot is smarter.

The growth of personalised services

The question is if the credit for more personalised service should go to chatbots or to live chat? If a citizen is on an electronic form on the website and they get stuck at a particular question, a chat window could pop-up with the question *'Hi this is Amy; how can I help you? You seem to need to find out what to fill in.'*

The citizen then experiences real service. The chance of completing the form is increased and the chance of a call of this person picking up the phone and ringing the Contact Centre is decreased.



A white coffee cup lid is at the top left. Below it, a notebook with a black pen is open, showing handwritten notes. The notes include: 'Marketing', '2.45 PM - Review PP', '* call John again', 'Book Flight', 'Sat, 10.', 'Flight: SP1675', '9.00 AM - Office meeting', '→ Organize new system', '→ develop social selling', and '→ Review Dashboard'.

A chatbot could start this conversation because the chatbot has all the information on how to help. The online conversion will get much better. As such, if the online conversion is better, either cost savings can be made, or the savings re-invested in dealing with more complex, value-add queries.

Another example is that the chatbot could collect all the file information needed to answer specific questions such as name, file number and birth date. When the agent takes over the conversation, it will be directly personally and relevant. In every case, chatbots add more value to the transaction when connected to data sources.

Inclusion: new accessibility for special groups

The shape of the interaction with chat or even by Voice makes public services more accessible. For example, people with visual impairments, people with literacy issues, immigrants or non-native speakers are now much more able to help themselves online or at the Town Hall. Young people like to use chat options for interaction instead of searching for information on websites.

Promising interactions for chatbots

The logical starting point for using chatbots is defined by the combination of:

- high volume of citizen interactions;
- technically and conversationally easy to implement chatbots;
- high impact on the innovation-reputation of the organization and their board members.

Promising use cases for chatbots are emerging:

1. making appointments for picking up ID-cards and driving licenses
2. reporting defects in the public space
3. out of office messages for closing hours
4. rerouting on the website to find the information more easily
5. answering easy questions e.g. opening hours
6. as helping tools alongside electronic forms to enable more online completion (and avoid citizens using more expensive channels (such as phone) to contact the council)
7. internal transactions within the Contact Centre, such as like reserving meeting rooms or IT support.

City of Roeselare, Belgium: chatbotBertje, the 1.000 subject chatbot

Kimberley van Luchem, project leader, kimberley.vanluchem@roeselare.be

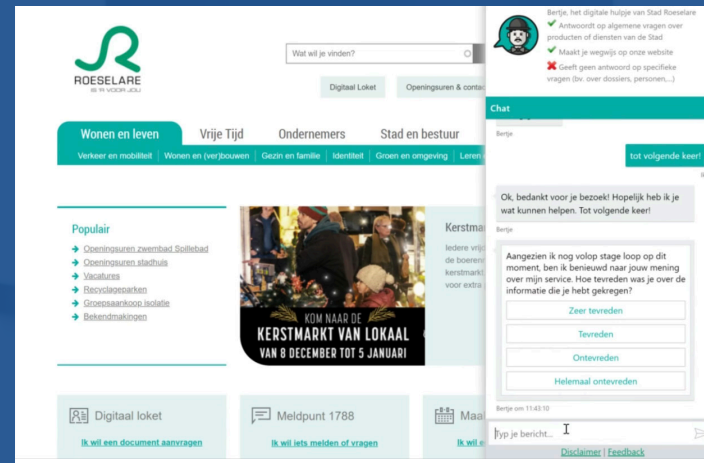
The aim of project Bertje is to develop a chatbot that answers all general questions of the City of Roeselare. Bertje also helps to find the right page on the website, by presenting the right links.

Where the city of Groningen developed a chatbot for just one topic (relocation, deep instead of wide), Bertje should be able to answer all general and simple questions by using AI and natural language processing.

As a result, 600 unique questions (1,700 questions and answers in total) are available in one chatbot. The chatbots answer just questions, there are no transactions. The more formulations per question a chatbot has, the more likely it is to give the right answers. The content within the chatbot is also available for the city's contact centre. The advantage of the chatbot within the Like! project is that it can be easily transformed to other municipalities by adjusting answers to the questions.

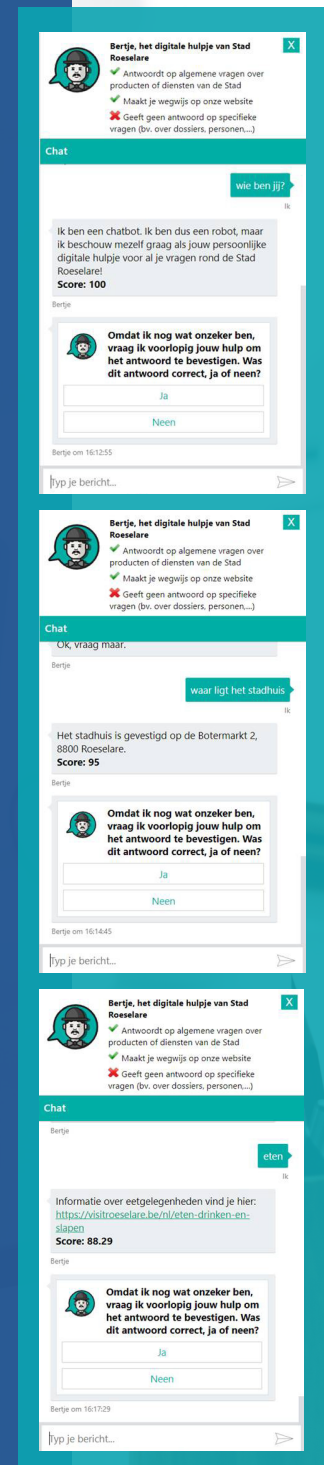
By covering a wide range of content and services, the advantage is that the chatbot is trained to be able to answer

a lot of questions. An important lesson learned is that when you for instance start with one topic, it will be easier to have quicker results (impact of the bot).



The 'content-part' is a big thing to deal with: content comes from across the whole organization. It's a challenge related to customer contact on all channels, not only for chatbots to get the content right and to keep it maintained. Chatbots are one of the reasons to start that challenge!

In the beginning of the project, we used Excel to provide all questions and answers to the developer. Further on in the project, a knowledge portal was set up, where we can see all questions and answers and adjust them where needed or delete and add topics as we wish. For the chatbot itself, Microsoft technology is used. The city of Roeselare is now doing several external tests, to see whether the chatbot is mature enough to go live.





A NEW COLLEAGUE - A VIRTUAL ONE

Hybrid contact with citizens

The technology for chatbots is developing strongly. The chances that a conversation with a chatbot ends up wrong is real; therefore, it can help to transfer the conversation to a real officer. This way, the citizen is always served well. The co-working of a chatbot and a real officer is called hybrid customer service.

In the webcare operation the chatbot is positioned as a new colleague, a virtual one, next to the other webcare officers. The virtual colleague does all the work until a certain level of complexity is reached, then the real officer jumps in. In webcare and live chat tools it is clear which of the messages is handled by the chatbot. The reports on performance of the customer operation - which are standard in those kind of tools - include the reports on the work done by the chatbot and the co-working.

Chatbots in the city's front office

Although the name gives the impression only a chatbot only works with things like live chat, the same type of interactions is also going on within other apps such as WhatsApp, Facebook Messenger etc. The chatbot is also valuable for those interaction channels: one bot, more interaction channels, andnd, a bot per type of conversation or purpose!



The functional architecture of a chatbot includes:

- a chatbot
- a chatbot platform to develop and maintain the chatbot
- a chat-possibility like live chat, WhatsApp or a messenger
- a webcare - possibility for tech handover from chatbot to a real officer
- connections to back office systems for picking up data or starting a transaction

Re-use of content is hard

Some tests with chatbots started with the idea of re-using the available content form the website or the intranet. Like the content in the Content Management System (CMS) e.g. the FAQ's. Unfortunately, this only works in some cases.

The answer to a question is available most of the time, but not always and everywhere. In addition, there are also some requirements for the delivery of products or instructions. The content management process needs to be maintained, correct and up to date. Having said that, the chatbot needs real conversations to train itself. It must find out which words citizens use, not the formal words the government uses (or the words that staff think that citizens use!) – put yourselves in the shoes of the citizen.

City of Aalborg, Denmark: the citizens need for chatbots

Grethe Fallesen, gf@aalborg.dk, project manager, <https://northsearegion.eu/like/use-case-papers/aalborg-chatbot/>

The City of Aalborg investigated the citizens' need for chatbots. With focus group interviews with two groups of young citizens Aalborg collected their views on chatbots.

Chatbots can only be a supplement to other channels, not replace them

The chatbot is fine for giving quick answers to simple questions but they said they would phone the municipality if they had more complicated questions or more than 5 exchanges of questions and answers.

It's essential to know you are chatting with a bot

This is important for ethical reasons and to adjust the citizens expectations to the service they can expect.

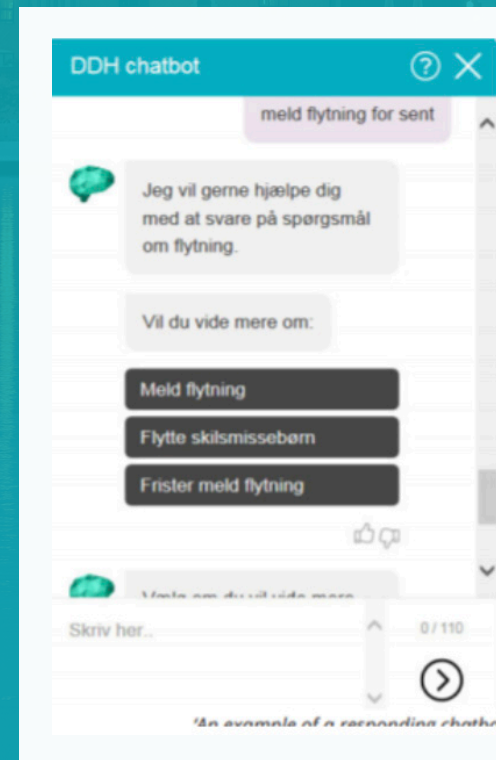
Great expectations

Although the young citizens didn't think a chatbot could answer complicated questions, they still had great expectations concerning the quality of answers and the variety of questions the chatbot should be able to answer.

Going the extra kilometer

The young citizens and the employees stressed that citizens will regard a service as very good if they get a little more service than they expect.

Next steps are selecting a tech supplier together with 35 other Danish municipalities. Probably they will start with relocation, driving licenses, passports and opening hours.





Organizations that have developed their webcare departments are lucky: they already have a lot of conversations that will help them to train the chatbot!

Some governments investigate the re-use of their content, answers are not available yet:

- re-use of content that is general for all government organizations
- re-use of content that is only local relevant
- re-use of dynamic content like prices of ID-cards or other product

Kimberley van Luchem: “Actual and accurate content was the biggest challenge in the beginning of the project. Now, the challenge is to train the bot properly, so that with the AI and natural language processing, the bot can distinguish the questions and combine them with the right answers.”

New skills needed

One of the biggest worries according to staff is that the introduction of chatbots will lead to job losses. In the speed of the development and the percentage of online interaction in comparison with for phone calls for example, the impact in the short term will be low. On the other hand, new activities, tasks and jobs will arise, such as Dialogue Managers to maintain the dialogue flows and maintain the

chatbots. Also new investment is needed for chatbots. So long as chatbots are competing for the same pots of cash allocated for web development and customer service, little progress will be made.

City of Groningen, The Netherlands: the allocation chatbot (2017)

Bram Scholtens, advisor in public service, via Bram.Scholtens@groningen.nl, <https://northsearegion.eu/like/use-case-papers/groningen-chatbot/>

The city of Groningen developed and tested a chatbot and its AI for the intake of the relocation. The chatbot was available on the website of the city of Groningen but was never used. Training the chatbot without real user data (real conversations) isn't a route to success: don't try and guess the words and questions citizens are using! An important result was the co-working with the webcare-team of the customer contact centre, the Like!-project team, a supplier and four other municipalities: just start and experience the tech, impact and possibilities is a result on its own. The tech used was from the same supplier as the webcare tool, which helped a lot: OBI Bots from OBI4wan. Next steps are implementing an out of office chatbot on the city's WhatsApp channel. A group of other cities develop a next version of the relocation chatbot.

IMPACT ON ORGANIZATIONS THAT USE CHATBOTS

The first chatbot projects help to address the impact on the organization that used those chatbots, but unfortunately without providing all the answers.



Impact on public service

- A new interaction and service channel between existing ones
- Coworking with the public service department or contact center
- An extra need for content management processes
New tasks like the development and maintenance
- of dialogue flows
Need for extra budget



Impact on communication

- A new channel to exploit the corporate identity
- A new opportunity for inclusion
- A new paragraph and new resources in the communication strategy



Impact on architecture

- A new entity: dialogue next to contact or file
- New functionality: chatbots, chatbot platforms, chat channels like live chat, WhatsApp and messengers

- New connections to be made from back office applications and data to the chatbot



Impact on security

- New functionalities and new channels that must meet the security standards
- New functionalities and new channels that must be tested
- New data like dialogs that also need to be classified



Impact on privacy

- Privacy by design applies also for chatbots: apply to the GDPR, also your suppliers via a data processing agreement
- What if the chatbot asks for personal information?
- How does the 'right to be forgotten' work in an AI-environment?
- The archiving of chat conversation



Impact on maintenance

- Of the chatbots and its dialogue flows
- Of the connections to databases and back office applications
- Of the content
- Of the performance
- Of the channels that use the chatbots



STARTING WITH CHATBOTS

When starting with chatbots, the first pilots and experiments are very valuable to get familiar with the technique, impact and possibilities of chatbots. After the first phase of experiments, when the use of chatbots gets more structural, the following eight questions get more relevant:

- What's the **purpose** of the chatbot?
- Where to organize the **control** and **ownership**?
- How to develop **knowledge** and **re-use experience**?
- How to **develop** our chatbots: make or buy?
- How to **finance** and **prioritise** the development and maintenance?
- How to deal with worries of our **officers**?
- What are the **constraints** and **requirements** for chatbots?
- How to keep the IT-landscape **flexible** and **clear**?

Interreg North Sea Region

Like! Report

Chatbots, the next step in customer service?

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