

## **Insee Contact chatbots**

### **I Context of the chatbot project**

In 2022, the French National Institute of Statistics (Insee) received more than 170,000 contact requests from users: entrepreneurs who had questions about the enterprise register SIRENE and about their administrative formalities, households and companies sampled in the context of surveys, or enquiring about statistical information. These requests can be sent to the « Insee Contact » service, whose mission is to answer these questions, using two channels : by telephone (more than 100,000 requests by telephone in 2022) or by a contact form (more than 70,000 requests in 2022).

The number of contact requests has been increasing continuously, from 140,000 in 2021 to 247,000 in 2023 based on the first semester trend, mainly due to a surge in questions related to business register formalities. The steady increase of new businesses and the setting up of a new one-stop shop<sup>1</sup> to centralise all formalities may explain this sustained demand.

A vast majority of the questions asked to Insee Contact are related to the French business register (50 % of total requests in 2016, 64 % in 2021). Requests for statistics represent only a small share of the total (9 % in 2021, down from 24 % in 2016).

To cope with this surge of applications, Insee Contact has recently increased its workforce. However, our service quality targets (pick-up rates, share of e-mail requests processed within 72 working hours) are becoming increasingly difficult to meet.

In order to improve the service offered to users, Insee has decided to implement chatbots as a new communication channel. This tool provides an instant response, 24/7, to user requests. It automatically handles low-value requests, allowing the advisors to focus on more complex inquiries, and it helps manage surges in demand during certain periods of the year (e.g., the start of a survey). Additionally, this new channel has the potential to reach a new audience that is more accustomed to this mode of communication.

### **II Project execution**

#### **II-1) Benchmark of several chatbots of public services**

In the end of 2021, a benchmark of several chatbots implemented by several national public services provided some lessons for the conception phase of Insee Contact chatbots.

Firstly, the vast majority of these public services chatbots do not connect their users with a live advisor (live chat) when the chatbot fails to resolve the user's issue. Most public services already offer a telephone response channel to establish direct contact with the user. It is thus assumed that the chatbot is a tool to alleviate the traffic of inquiries to the advisors available on other channels and is not intended to systematically solve all problems.

Furthermore, the knowledge bases of the chatbots included in this benchmark are based on a set of predefined scenarios triggered by users' initial queries (e.g., "I lost my username," "I'm looking for information about my rights," etc.). After the initial query, the user is regularly prompted to choose from several options to progressively refine their intent and ultimately provide them with the answer they need.

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1 *Guichet unique pour les formalités d'entreprise* : <https://formalites.entreprises.gouv.fr/>

The benchmark was conducted before the emergence of GPT models on the market, when purely conversational chatbots were not able to accurately identify user intentions or engage in complex conversations. The benchmark favored a decision tree-like structure instead of purely conversational logic. Only few companies in the digital sector had sufficient resources and training data at that time to simulate a conversation that would offer a satisfactory user experience.

Most chatbots implemented by French administrations were created by private providers, though a digital lab of public administration created an open source chatbot factory<sup>2</sup> (or Robot Process Automation), using open source AI engine RASA. As our multichannel provider (emails and phone) could offer a chatbot service as well, Insee Contact decided to start with this service: their solution was already on the market, our staff could manage the knowledge base of the chatbot on a back office website. This back office enabled Insee Contact to adapt the level of language of the bot and to customize the format of the chatbox. This solution would also in the future permit Insee to connect users with our advisors staff, already using the multichannel platform of our provider.

## II-2) Creation of three FAQ chatbots on simple to more complex topics

In the long term, Insee's goal is to offer a chatbot on its website that covers all the topics of questions addressed by users. However, considering the diversity of encountered subjects and user profiles, the decision has been made to proceed in stages, first experimenting with FAQ chatbots on specific webpages dealing with particular topics (survey responses, business register, etc.).

### ➤ Business survey chatbot

Following the benchmark phase, we decided to start with a first chatbot on the [business survey online portal](#). Many surveyed business ask Insee Contact about difficulties to connect and to navigate on this portal. This was a good start to test the feasibility of chatbots for several reasons, as the profile of users and their problems are homogenous.

We started the project in February 2022 by setting up the knowledge base (about 25 questions) and customizing the chatbot. In August 2022, the chatbot was placed on the portal and answered its first questions. It has been functioning 24/7 since it was created.

About one year after it was created, the performance and impact of this first chatbot are stabilized. During the first semester of 2023, about 400 conversations per month were held with the bot (see *Annex 1* for statistics on the chatbots' performances), equivalent to about a third of the number of e-mails received by Insee Contact relative to the business survey portal. The accuracy rate<sup>3</sup> gradually improved after a few months of training, reaching 74% in the second quarter of 2023. As most of the questions asked by users are selected among the questions suggested by the chatbot, rather than typed by the users<sup>4</sup>, the final accuracy rate<sup>5</sup> is above 95 %.

However, the impact on e-mails sent by users seems limited. During portal downtime, their number tends to be higher than before, whereas it is about 10 % lower when the portal is functioning correctly. This limited impact can be explained by the fact that 60 % of questions asked to the chatbot require a human action (new employee in charge of answering the survey, forgotten login, etc.). In these cases, users are redirected to the contact form, the latter being then converted into an

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2 L'usine à chatbots : <https://beta.gouv.fr/startups/usine-chatbots.html>

3 Ratio of the number of typed texts understood by the chatbot to the total number of typed texts sent to the chatbot by users.

4 Less than 20 % of the questions are typed by users. The most frequently asked questions are displayed by the chatbot after its introduction message. Besides, after answering a question, the chatbot asks the user whether he/she is satisfied with it. Relevant questions are displayed in case of dissatisfaction expressed by the user.

5 Calculated as the ratio of questions (typed or selected by users) understood by the chatbot to the total number of questions sent by users.

e-mail sent to Insee Contact. The chatbot enables users to get information about their situation and to know how to proceed to get their problem solved.

➤ Population census chatbot

After the successful creation of the first chatbot, a second one was conceived in the second half of 2022 on the population census website. The population census is an annual household survey, involving 8.5 million people and lasting for 4 weeks, from mid-January to mid-February every year. Most of users send questions to Insee Contact during the first two weeks of data collection, generating thousands of requests. The main goal of this chatbot was to curb this incoming flow of requests. Only about 30 questions from the 84 frequently asked questions displayed on the census website were put into the knowledge base of the chatbot, in order to improve its accuracy rate on the most frequent questions.

The chatbot for the 2023 population census was successful in terms of number of questions, with about 2 500 conversations (the same as the number of requests by e-mail) resulting in 4 600 questions asked to the chatbot. However, Insee Contact faced more e-mail requests than the previous year (+42 %), pursuing the upward trend observed for several years. The topics of the questions asked to the chatbot by users are identical to those sent by contact form in 2022 (difficulty to connect to the portal, questions about the organization of the survey collection, etc.) with the same relative proportions.

This experience raised questions about the impact of chatbots on the final number of requests to our advisors team. It seems that offering a new contact canal did not help curb the workload. This observation seems to be shared by other customers of our omnichannel platform provider. The reasons why are still unclear : do users ask our advisors to verify if the chatbot's answers are correct ? Do they have even more questions after having a conversation with the chatbot ?

➤ Business register chatbot

Thanks to the experience gathered with the first two bots, Insee Contact created a third one addressing the main topic of requests: the French business register.

This chatbot offers a bigger challenge, as the questions regarding the business register represent 85 % of phone calls and 55% of e-mails for Insee Contact in the first half of 2023. It came live in April 2023, answering questions on the following themes:

- public dissemination of data on organizations : enterprises, associations and public bodies can choose to hide some personal data (e.g. the name of executives and the address of the firm). Some firms prefer to reveal these informations to help public funding administrations or banks to identify them.
- main activity sector (NACE) : Insee has to classify every business by NACE sector for statistical and economic analysis purposes. Firms may request a change of classification.
- Administrative formalities : during the process of firm creation, Insee assigns an identifier to a firm. Users often ask what is the precise role of Insee and what are the interactions between Insee and the one-stop shop system responsible for the firm creation process (« guichet unique »).
- Identifier and « Identity card » : the public can download information from any firm, association or public body by typing its identifier.

As this third chatbot is still in its first months of training, the accuracy rate is about 60 %, as usual at the beginning of this kind of project. The topic might not help boost the performance of the chatbot: users situations can be very different from one to the other, they also give many details

about their situation in a single sentence, which can be a challenge for a bot whose primary task is to understand the expressed intention.

The chatbot was specifically designed to nudge users to select their question among those it suggests, in its introduction message or when users express dissatisfaction, rather than by typing it in the input bar. In addition, as seen in other public service chatbots during the benchmark, users are prompted to choose between several buttons to get a personalized answer. This can be useful, as people can be in very different and complex situations, for example when they want to have information about their firm creation or modification process.

This boosts the total accuracy rate, taking into account the fact that the questions selected by users have by definition a 100 % accuracy rate. Given that 84 % of the questions are asked by selecting them from a list of pre-defined questions, the final accuracy rate is 94 %.

The number of users of the chatbot (about 600 conversations per month) is still largely inferior to the number of e-mails received by Insee Contact about the register (up to 1 000 per week in 2023). The chatbot is gradually displayed in more and more webpages to incite users to have more interactions with the bot. The choice of webpages is also important: the first page chosen for the business register chatbot was one of the most visited of the insee.fr domain (business register homepage, with 1,500 daily visits) but only 2 % of visitors triggered a conversation on this page. On the other hand, 10 % of visitors of the second webpage containing the chatbot (FAQ webpage, 160 daily visits) have a conversation with the chatbot. The difficulty to get more conversations might come from the fact that people want an immediate response and could feel the need of a human contact, as they want answers to get their firm quickly created or financed by a loan.

### **III Work in progress**

#### **III-1) Live chat**

Following the third chatbot on the SIRENE register, Insee Contact is working on the possibility to connect the users with an advisor after a first interaction with the bot. The experimentation will be implemented at the end of the year 2023. It will require training for the advisors.

#### **III-2) Satisfaction survey**

In order to better assess the impact of chatbots on the number of contact forms transmitted by users, Insee Contact will launch a survey of them, asking them particularly whether they used the chatbot before asking their questions, and why they used the contact form after a conversation with the bot. Insee Contact will thus be able to quantify the relative weight of conversations with incorrect answers from the chatbot, with questions not in the bot's knowledge base, or forms completed by users who wanted a confirmation by a human person of a correct answer from the chatbot.

#### **III-3) New procurement**

A new procurement will be launched in 2024 to replace the current chatbot service. This will be an opportunity to experiment new technologies such as callbots (i.e. phone conversations held by a bot, using voice recognition and natural language understanding and processing), or the inclusion of GPT models in the architecture of FAQ chatbots. For example, some providers reckon that, in a few months, it will be possible to convert a simple list of examples of questions and answers into a full knowledge base used to build a complete chatbot.

Insee is also interested in following progress of projects conducted by other National statistics institutes and international cooperations about chatbots or in participating at any of these cooperations. Some resources from Insee (datascientists) could be assigned to such projects.

**Annex 1: Statistics on the use and accuracy rate of Insee Contact chatbots**

<b>Indicators</b>	<b>2023 H1</b>	<b>2023 Q1</b>	<b>2023 Q2</b>
	<b>Business survey portal</b>		
<i>#conversations with the chatbot</i>	<b>2 345</b>	1 201	1 144
<i>#questions (on pre-defined list)</i>	<b>2 710</b>	1 461	1 249
<i>#questions (by typing)</i>	<b>519</b>	228	291
<i>Accuracy rate</i>	<b>72%</b>	69%	74%
	<b>Population census</b>		
<i>#conversations with the chatbot</i>	<b>2 991</b>	2 884	107
<i>#questions (on pre-defined list)</i>	<b>3 071</b>	2 970	101
<i>#questions (by typing)</i>	<b>1 687</b>	1 624	63
<i>Accuracy rate</i>	<b>62%</b>	61%	72%
	<b>Sirene register</b>		
<i>#conversations with the chatbot</i>	<b>1 300</b>		1 300
<i>#questions (on pre-defined list)</i>	<b>3 640</b>		3 640
<i>#questions (by typing)</i>	<b>685</b>		685
<i>Accuracy rate</i>	<b>62%</b>		62%


## Annex 2: Screenshots of Insee Contact chatbots

After opening the webpage, a trigger button « Besoin d'aide ? » (« Need help ? ») is displayed at the bottom right of the page. When the button is triggered, the chatbox opens up and unveils an introduction message permitting to start a conversation with the bot.

### 1. Chatbot on the business survey portal

En naviguant sur notre site vous acceptez l'installation et l'utilisation de cookies sur votre navigateur.

Aide en ligne Contacter l'assistance

 **Portail d'authentification**  
Réponse aux enquêtes entreprises de la Statistique publique (<https://entreprises.stat-publique.fr/portail>)

**Aide à la connexion**

Pour vous authentifier, veuillez saisir l'identifiant (7 lettres majuscules et/ou chiffres) et le mot de passe qui vous ont été précédemment transmis.

Pour des raisons de sécurité, le nombre de tentatives de saisie de vos éléments d'authentification est limité.

Vous disposez de 30 minutes pour vous authentifier.

Si vous ne parvenez pas à vous authentifier, veuillez consulter l'aide en ligne.

Votre site de réponse en ligne fonctionne avec de nombreux navigateurs mais certaines fonctionnalités, dont le renouvellement de mot de passe et l'accès à notre formulaire d'assistance, ne sont pas possibles avec Internet Explorer. Si vous avez besoin de renouveler votre mot de passe et que vous ne pouvez pas changer de navigateur, veuillez contacter l'assistance par un courriel à l'adresse qui figure sur le courrier que vous avez reçu.

**Authentification**

**Identifiant**  
Entrez votre identifiant...

**Mot de passe**  
Entrez votre mot de passe...

Se connecter


[Identifiant oublié ?](#) [Mot de passe oublié ?](#)

**Besoin d'aide ?**

Copyright Insee    Accessibilité    Mentions légales et crédits    Accéder au site de l'Insee

En naviguant sur notre site vous acceptez l'installation et l'utilisation de cookies sur votre navigateur.

Aide en ligne Contacter l'assistance

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**Authentification**

**Identifiant**  
Entrez votre identifiant...

**Mot de passe**  
Entrez votre mot de passe...

Se connecter

[Identifiant oublié ?](#) [Mot de passe oublié ?](#)

**Portail des enquêtes entreprises**

Bienvenue sur notre portail de réponse aux enquêtes. Je suis un assistant virtuel vous proposant de vous aider sur ce site.

Sélectionnez une des questions les plus fréquentes ou posez votre question dans la barre ci-dessous, en formulant des phrases courtes.

- J'ai un message d'erreur "État HTTP 400" à la connexion
- J'ai perdu / oublié mon mot de passe
- Je n'arrive pas à me connecter
- Je suis le nouveau contact pour répondre à une enquête et je n'ai pas d'identifiant personnel

**J'ai perdu / oublié mon mot de passe**

Votre mot de passe initial vous a été transmis dans le courrier de lancement de l'enquête. Il doit être modifié à la première connexion.

En cas de perte, veuillez faire une demande de nouveau Message...

Copyright Insee    Accessibilité    Mentions légales et crédits    Accéder au site de l'Insee

## 2. Chatbot on the population census FAQ webpage



**Recensement**  
de la population 2023

**ACCUEIL** | **C'EST UTILE** Des chiffres pour construire demain | **C'EST SIMPLE** Comment ça marche ? | **C'EST SÛR** Vos informations sont protégées | **RÉPONSES** À vos questions

Accueil > Réponses


### Posez votre question

Votre question

### Rechercher par thème :

### Questions fréquentes :

- Comment obtenir un autre bulletin individuel ?
- Qui doit remplir un bulletin individuel ?



**Recensement**  
de la population 2023

**ACCUEIL** | **C'EST UTILE** Des chiffres pour construire demain | **C'EST SIMPLE** Comment ça marche ? | **C'EST SÛR** Vos informations sont protégées

Accueil > Réponses

### Posez votre question

Votre question

### Rechercher par thème :

### Questions fréquentes :

- Comment obtenir un autre bulletin individuel ?
- Qui doit remplir un bulletin individuel ?

Insee - Le recensement et moi

Bienvenue, je suis un assistant virtuel vous proposant de vous aider sur le site du recensement de la population.

Sélectionnez une des questions les plus fréquentes ou posez votre question dans la barre ci-dessous.

Suis-je recensé(e) cette année ?

Je n'arrive pas à me connecter avec mes identifiants

Quand et comment répondre au recensement par internet ?

Quels logements sont concernés par le recensement ?

Suis-je recensé(e) cette année ?

Les communes de moins de 10 000 habitants réalisent une enquête de recensement portant sur toute leur population, à raison d'une commune sur

Posez votre question ici...



### 3. Chatbot on the business register webpage

The screenshot shows the Insee website's 'Services' page for Sirene. The header includes the Insee logo, navigation menu, and search bar. The main content area features a blue banner with the title 'Sirene' and a list of services: 'Démarches, APE, Avis de situation, Accès aux données, API, LEI'. Below this, there is a paragraph explaining the Sirene system and a link to 'Entreprendre.Service-Public.fr'. Three service cards are displayed: 'Obtenir un avis de situation au répertoire Sirene', 'Modifier le statut de diffusion au répertoire Sirene', and 'Demander la modification de son code APE'. A yellow button labeled 'Besoin d'aide sur Sirene ?' is located on the right side.

This screenshot shows the same Insee website page with a chatbot interface overlaid on the right side. The chatbot window is titled 'Insee - répertoire Sirene' and contains a welcome message: 'Bienvenue sur notre page relative au répertoire Sirene. Je suis un assistant virtuel vous proposant de vous orienter dans vos démarches.' Below the message is a list of topics to select: 'Diffusion de vos données', 'Avis de situation', 'Activité principale exercée (APE)', 'Comment suivre l'avancement de mon dossier de création, de modification, ou de cessation?', and 'Autres sujets'. The 'Activité principale exercée (APE)' option is selected. A text input field contains the question 'Que voulez-vous savoir ?' and a button labeled 'Comment connaître mon code APE ?'. Below the input field is another button labeled 'J'ai une question sur le changement d'APE'. At the bottom of the chatbot window is a text input field with the placeholder 'Tapez votre message ici...' and a send button.

All three chatbots are smartphone-responsive. Below: Smartphone screenshot of the business register chatbot.

