

# Groupwork: Designing the Ideal Platform for Chatbot Development and Research\*

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**Abstract.** With the large number and diversity of tools available to design and run studies with conversational agents, it can be challenging to find the right tool to address a particular research question. In this groupwork, together with attendees we will share our experiences using the tools that are currently available (e.g., Dialogflow, Rasa). This is followed by a co-creation session where we will dream up the ideal supportive tool.

**Keywords:** Conversational agents · Support tools · Co-creation.

## 1 The Need for Open, Research-Focused Tools

As researchers, educators, and practitioners in the field of conversational agents, we have a broad range of research questions that we want to address, focusing on technical aspects (e.g., can we use neural language models to form a conversation?) as well as the resulting human-agent interaction (e.g., do people experience the agent as humanlike, and is that a good thing?) [7]. This calls for a multidisciplinary approach, involving researchers and students with varying degrees of technical skills. It is therefore important to have easy-to-use tools to develop conversational agents that can empower researchers and educators, and help democratize the development and use of conversational agents [7].

When looking at existing tools, a distinction can be made between platforms (Google’s Dialogflow [2]), services (Microsoft’s LUIS [3]), frameworks (Rasa [4]), and libraries (ChatterBot [1]) [10]. Platforms and services tend to offer a no-code or low-code environment, while frameworks and libraries can facilitate the programming of chatbots, although they generally require more technical knowledge [10]. The functionalities of tools that support the development of conversational agents can roughly be divided into [10]:

- **Intent recognition** and natural language processing (NLP), including aspects such as sentiment analysis;
- Performing **actions** based on the user input, including replies to the user (natural language generation, NLG), data storage or logging, connecting

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- with external services (e.g., to make a holiday booking), and creating a knowledge-base to understand what is said;
- Maintaining an overall **conversation path or flow**;
- Managing the **memory and dialog state** of the conversational agent, to enable replies that refer to topics that were discussed previously, either within the same conversation or in a previous conversation with the same person;
- Support for **testing and deployment**, including connections to existing (messaging) platforms, robots, etc.

Ongoing scientific research efforts ideally require a platform that has easy-to-use basic implementations of these functionalities so that it is quick to get started, but also provides the opportunity to go beyond these basic implementations in order to innovate, for example, the NLG part of the interaction, to focus on a specific research question. A key step in offering this degree of control over the functionalities of a platform is to make it open source. Some open source frameworks, which require a degree of technical skills, do exist [4, 6, 8, 9], but the majority of no-code or low-code platforms are closed source (e.g., Google’s Dialogflow [2]) [5, 10]. They are often aimed at industry for commercial purposes, thereby boosting commercial adoption of chatbots, but are likely not able to support research, particularly in less technical fields, as well as they potentially could [11].

Moreover, it is important to consider that the role of platforms and frameworks as tools to create conversational agents goes beyond merely facilitating the creation of the interactions themselves. The features that platforms do and do not offer, as well as the way in which they are presented to their users (i.e., how usable they are), can have an impact on the quality of the chatbots that are made using the tool [10, 12]. As such, these tools can be considered a way to communicate best practices to their users, for example with regard to standardized testing of the resulting interaction [7]. In other words, the platforms carry a certain responsibility for ensuring that the interactions that are designed using the platforms are of high quality, ethical, and that they provide a good user experience. This further underlines the need for an accessible, open solution that is based on the input, context and knowledge of many.

## 2 Aim and Planning of the Groupwork

Because there are many existing tools, and with the field of research on conversational agents being broad and diverse, we propose to share our experiences with different platforms in order to create an inventory of what the ideal platform should look and behave like. We aim to do this by going through three main phases in the groupwork session:

1. Brief introduction round, followed by an interactive discussion in which we share our experiences (in development, research, and teaching) with currently available platforms (approx. 60 mins);

2. Co-creation session in subgroups with pencil and paper to brainstorm about the ideal platform (approx. 40 mins);
3. Wrap-up where insights from the co-creation session are linked to points that resulted from the interactive discussion (approx. 20 mins).

We aim to share the outcomes of this groupwork with attendees and the broader audience of researchers in the field of conversational agents, first through an openly available report and later potentially in the context of a scientific publication.

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