

**Chatbots as an approach for a
faster enquiry handling process in
the service industry**
A comparative study at the ÖAMTC

Bachelor Thesis for Obtaining the Degree

Bachelor of Business Administration in

Tourism and Hospitality Management

Submitted to Dr. Lyndon Nixon

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Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

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Abstract

The integration of new technologies in service industries is illustrating an increasingly important factor for creating a well-perceived customer's experience. Nowadays, it is the main goal of organisations to create a customer service experience which customers are satisfied with and to create loyalty amongst them. To do so, chatbots can be used because they are available permanently, providing quick answers, they can promote offers and increase cross- and upselling (McCall, 2017), they can make individual recommendations to the customer, increase convenience, save overall costs and maximise customer engagement and outreach (Jain, 2016). Likewise, incorporating chatbots can bring along great potential to open up new opportunities concerning customer service. However, chatbots also carry along many limitations, especially because they have been in commercial use only for a few years. (Fakhrudin, 2017) As the ÖAMTC is the central focus of this thesis, the priority was to unveil the advantages and disadvantages of German-operating chatbots in service industries. In addition, a comparative evaluation was done in order to be able to give insights into the usefulness of chatbots and to provide recommendations for incorporating a chatbot. Subsequently, this dissertation prepares a list of some of the ÖAMTC's enquiries including which ones could be standardised and which ones require human interaction.

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1 Introduction

Chatbots appear to be almost anywhere – whether that is KIA’s Facebook page (<https://www.facebook.com/Kiamotorsworldwide/>) interacting with the customer on Facebook Messenger or SnapTravel (<https://www.facebook.com/snaptravel/>) trying to find the perfect hotel via simply interacting with the customer on messaging apps. (Sablich, 2017)

Nowadays, chatbots have gained popularity due to their permanent availability as Software-as-a-Service, their improved linguistic features and the improvement of intelligence thanks to machine learning and AI. As a result, chatbots have contributed to one third to half of all online conversations from 2007 to 2015. (Tsvetkova et al., 2016 in Benton & Radziwill, 2017) Interesting enough, chatbots were actually first designed to find out whether users could be misled into thinking they were human beings. (Abu Shavar & Atwell, 2007a)

Dmitrii Dumik, the co-founder of Chatfuel, believes that chatbots will turn into a more engaging experience and finally become just as or even more popular than the mobile application is today, providing the user with a more convenient experience. (Russell, 2016)

One may not consider chatbots as being one of the newest and most emerging trends in technology and Social Media, however, Schlicht (2016) argues that the four biggest messaging applications have already overtaken the four biggest social networking apps in number of active users, which demonstrates the increasing significance of engaging with customers via messaging applications. Furthermore, the fact that chatbots are faster than most other applications or websites for users to reach their goals illustrate the further importance.

1.1 Aims of the Bachelor thesis

The aim of this Bachelor thesis is to present the results of the literature review, examining the importance and usefulness of chatbot applications. Furthermore, the objective is to provide a comparative study between different chatbot platforms in

order to be able to evaluate which one will be the most convenient and most appropriate to use for the enquiry handling process at the ÖAMTC.

Without controversy, technology develops all the time and chatbots have shaped part of the most recent developments. However, little is known whether this technological trend is actually working well in day-to-day life and is accepted and used by customers. Consequently, another purpose of this research is to determine whether chatbots are ready to be used in professional setting.

In answering these questions, the thesis aims to provide an overview of the current state of chatbots, especially with regards to being exchanged with a human infomediary. Thereupon, it is intended to prepare suggestions for businesses wanting to incorporate a chatbot application. Although the history and the components of chatbots build part of the literature review, the main focus is put on the professional aspects of this subject.

It is to mention that the focus in this research lies on text-based chatbots only, however, as proposed by Durkin (n.d.), it is to acknowledge that AI shifts towards being voice-based, out of which both have the same technology behind them. (Knight, 2017)

1.2 Glossary

Chatbot

The word chatbot originates from the two words chat and robot and describes a relatively new computer application designed to simulate conversations with users via a chat. (Definition of Chatbot in, n.d.)

Artificial Intelligence

Artificial Intelligence is best described as the development of a computer system's ability to perform tasks normally, requiring human intelligence, such as visual perception, speech recognition, decision-making and translation between languages. (Definition of Artificial Intelligence, n.d.)

Natural Language Processing

NLP can be defined as the application of computational techniques to the analysis and synthesis of natural language and speech. (Definition of Natural Language, n.d.)

Algorithms

Algorithms are processes or sets of rules to be followed in calculations or other problem-solving operations, especially by a computer. (Definition of Algorithms in, n.d.)

AIML

AIML is a XML based programming language which was initially designed to help the development of A.L.I.C.E., created by Richard Wallace, and is a text file with a specific structure which makes up the knowledge base of a chatbot. Nowadays, it is widely used in the development of software agents that communicate with their users using Natural Language. (Burguillo et al., 2009)

Enquiry

An enquiry can be explained as an act of asking for information. (Definition of Enquiry in, n.d.) In the case of the ÖAMTC, enquiries can be sent via mail in case questions or problems arise.

JSON

JavaScript Object Notation is a lightweight data-interchange text format that is independent of any other language, but uses conventions which are similar to other programming languages. (The JSON Data Interchange, n.d.)

SQL

SQL, Structured Query Language, is an international standard for database manipulation. (Definition of SQL in, n.d.)

Query

A query can be defined as a question, especially one expressing doubt or requesting information. (Definition of Query in, n.d.)

Personalisation

Personalisation includes using user specific information to individually shape the interaction process with customers. (Pinhanez, 2011)

2 Literature review

2.1 Definition

“The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.” (Weiser, 1991)

What can be drawn from this quote is that any technology that is implemented, accepted and used frequently by the human species gets to be taken for granted, while turning into an essential and becoming labelled as a necessity of everyday life. At one point, there will be no point of return, guaranteeing that the mentioned technology will stay part of the lives of everyone. Benton and Radziwill (2017) suggest that this could happen with chatbots.

Benton and Radziwill (2017) describe a chatbot as the impression of interacting with humans online, while actually communicating with a computer software, put to life by natural language input. Others simply define it as a computer program which imitates conversations with users, applying artificial intelligence. (Wong, 2016)

Scharl (2004) explains that a chatbot is a software which typically permits textual communication using natural language. It seems crucial for the user’s acceptance of chatbots to simulate real humans, which in turn further highlights the critical importance for a large knowledge base, i.e. the existing set of rules a chatbot has. (Scharl, 2004)

With more and more advertising making it to and overwhelming customers both online and in real life, the difficulty of reaching them turns more and more into a difficult task. Chatbots could soon become one of the best ways for organisations to get in touch with the individual customer and will decide upon a company’s competitiveness. (Moore, 2017) Furthermore, key developments concerning the growth of messaging services and the advances in Artificial Intelligence have largely attributed to the recent interest in chatbots. (Guzman & Pathania, 2016)

2.2 Human-computer interaction

Human-computer interaction requires the accurate development of information systems which serve as a support for users to perform activities in a more productive and accurate manner. (Preece, 1994) This is relevant for organisations as it is crucial for them to make sure newly implemented technology is largely accepted by users in real life.

New changes in technology will only be adapted once they are well designed. This does not necessarily apply to every single individual, but it is crucial to make sure to welcome the people to whom it was intended for, which in turn highlights the importance of usability testing. (Preece, 1994) According to Norman (1988, 1992, in Preece, 1994), visibility and affordance can be classified as the two main principles to ensure appropriate human-computer interaction, i.e. technologies should be clear and functional to a user. Again, as mentioned above, this emphasizes the relevance of usability. (Preece, 1994)

Usability refers to the easiness to learn and use systems. If a computer system is poorly designed, users will come across obstacles and increasingly find it useless. However, a good usability does not necessarily imply that a computer system provides many different features. By ensuring good usability, a firm strives to understand people's characteristics and how they use a technology, establish tools to develop computer systems that are suitable for the activities they are intended for, and to achieve an efficient and effective human-technology interaction. Taking all these aspects into consideration, the priority should always be the user himself. (Preece, 1994)

Making sure a computer system works according to standards laid down beforehand can be measured by using metrics. Simply put, metrics are numerical measures. Many different kinds of metrics can be used, varying depending on what they are intended to be used for. The four main allocated classes are as follows (Preece, 1994):

- (1) Duration measures are used in order to be able to measure how much time is spent doing a certain activity.

- (2) Count measures ensure to record the amount of times a specific action happened.
- (3) The proportion of the task completed is naturally not such an easy measurement, however, the main thought is to, firstly, set goals and then, secondly, count how often the desired outcome was achieved.
- (4) Similarly, the quality of output is difficult to measure as it is made up of many components. One could simply argue that it is simple to divide between good and bad quality, however, when it comes to human-computer interaction, the user's perception plays a big role.

2.3 Components

Generally, one can think of chatbots as the combination of three parts, namely the interface, which is the interface between the chatbot and the human users through a messaging app or a chat session on a company's website, the intelligence, which allows the chatbot to understand and solve customer queries and to learn from each interaction, and the integration, which mainly covers the integration with other systems and platforms. (Guzman & Pathania, 2016)

Furthermore, chatbots consist of inputs and outputs. (Preece, 1994)

According to Preece (1994), input can be best described as recording and entering data into a system and delivering instructions to the system. In order for a chatbot to work, the user's input into the chat has to match with one of the pre-defined inputs in order for the computer system to be able to interpret it correctly. Consequently, the three key elements include the following: A chatbot has to be able to adhere to the characteristics of its user, be appropriate for the tasks it is intended to perform and the work and environment it is designed for. After implementing, making sure to acquire appropriate feedback in order to be able to evaluate the system itself and have the possibility to adapt appropriate changes. (Preece, 1994)

Output can be defined as the conversion of information from a computer system into a form which is recognisable to a human. (Preece, 1994) Similar to inputs, it is important to know whom and what the system is intended for so that an appropriate

input-output-structure can be set up. As proposed by Preece (1994), collecting feedback is important for the long-run usability of a computer system.

2.4 Opportunities

The times when interacting via telephone calls or face-to-face contact were the only possible solutions for communicating with customers are over. With chatbots becoming more and more popular, their advantages are also coming to show. (McCall, 2017)

The main advantage of chatbots are their permanent availability. Chatbots are online all the time, handling the user's queries. As customers expect accurate, individual and quick answers when contacting a company, chatbots will adhere to those expectations due to their extensive knowledge and availability. Additionally, the problem of having to wait until one gets through to an employee is solved as well since most chatbots offer the feature of handling unlimited queries at the same time without causing problems. However, it is recommended to let users know that they are communicating with a computer upfront, rather than trying to hide it from them and trick them. (McCall, 2017)

Chatbots have the capability to increase cross- and upselling and to support customers in finding the perfect item when shopping online. (McCall, 2017) By doing so, chatbots are able to make recommendations based on past information, preferences and order histories. This will also enable one-click ordering the following time, increasing convenience for the customer. (Jain, 2016) Furthermore, there will not anymore be a need for answering FAQs as chatbots work as a substitution for them, automizing the process and at the same time providing customers with appropriate answers and increasing satisfaction amongst them. (McCall, 2017) Deploying bots on e-commerce platforms is beneficial as it can also take over the return process, reducing resources spent on staff and maximising customer's satisfaction and loyalty. (Jain, 2016) According to Fakhruddin (2017), the estimated annual savings due to the use of Artificial Intelligence bots will be over 8 billion dollars by 2022.

Nowadays, it is possible to find an organisation's target audience easily and market its product well to it. Chatbots can function as a subscription tool and, for example, provide fitness tips, which offers a company the opportunity to promote and sell an appropriate item or product, using this subscription chatbot for affiliate marketing. (Jain, 2016)

The four main advantages of chatbots include added convenience, saved costs, the opportunity to maximise customer engagement and outreach and minimise customer service man hours. (Jain, 2016)

The travel industry could specifically benefit from using chatbots as they serve as 24-hour customer care specialists and, if set up well, without the necessity of human interaction. Furthermore, customers will be served quickly as the time spent waiting for an enquiry to be answered is reduced and chatbots provide answers instantly. (White, n.d.)

According to a study conducted by Retale, as proposed by White (n.d.), the majority of humans is open towards using chatbots, which could mean that, if used by customers regularly, a company will be able to profile customers and collect rich qualitative data, enabling the identification of trends amongst the company's target group. Additionally, a business could send out feedback forms or surveys after the conversation and collect even more information on how to improve the guest's experience. (White, n.d.)

2.5 Challenges

Like any other form of technology, chatbots also have a few disadvantages and potential risks. (Fakhrudin, 2017)

Heterogeneity issues exert influence and great impact on any service. Customers are individuals with their own identities and requirements, allowing the provision of services to be highly unique and tailored to the specific individual. This is also represented by the need of personalisation. Furthermore, it is not only important to focus on service quality consistency in order not to be guided into a vicious circle,

where bad service quality could potentially ruin a business, but also to provide service recovery for any unsuccessful services. (Pinhanez, 2011) All these aspects are not solely applicable to chatbots but all other internet services.

Generally, almost all service processes have to deal with the issue of simultaneity or inseparability. This encourages the fact that most of the time, services are produced and consumed at the same moment, meaning that production will not start ahead of input provision of the user. (Pinhanez, 2011) Naturally, this will also have an effect on any enquiry handling process. Demand is difficult to predict, so it can be that the respective employee planned less time than he should have in order to answer all enquiries on a correct and timely basis. Pinhanez (2011) further evaluates the importance of performance consistency and the ability to handle different services on an equally well-perceived level. However, all these processes are intangible, making it even more difficult to measure the effectiveness of service provision.

As chatbots are programmed by developers, they exist of pre-programmed knowledge and will only recognise an input if it accords to an expected path. As soon as something that does not fit the expected path is put into the chatbot, the output will be greatly affected. The output will therefore either be repetitive or irritating for the customer, not providing the correct answer and leaving users unsatisfied. (Fakhruddin, 2017) One major problem aligning input provision forms sarcasm and irony, as chatbots seem to be unable to interpret sarcasm in the right way, thinking of it as genuine. (Thapa, 2016)

As mentioned in 2.4, an advantage of chatbots is the convenience when shopping online and finding products for a customer via the chat. (McCall, 2017) However, this could also lead to possible confusions, changing the customer's buying decisions. Having to narrow down each filter characteristic, for example size, colour, type and material, could become a time-consuming task, reducing the convenience for the customer and eliminating the advantage of this aspect. (Fakhruddin, 2017)

Due to the decrease of customer service man hours, as proposed by Jain (2016), chatbots could possibly contribute to a decreasing demand for workers. The main jobs that will be affected are ones with low-level and repetitive tasks, becoming replaced by a chatbot as a standardised process. In the long run, the threat of decreasing

demand for low-level jobs will particularly become serious in developing countries, where a large share of the population works in such a job. (Fakhruddin, 2017)

Since the world-wide use of chatbots has only been booming for the last few years, the threat of social engineering attacks has been very high. The example of Microsoft Tay, which started to tweet racist tweets just days within its launch, demonstrates that hackers tried to abuse chatbots to spread racist, sexist or other offensive news. Furthermore, some user's willingness to use a chatbot could be held back for the reason that chatbot data handling seems to be an issue which was not yet properly solved. Users should be able to trust the chatbot and any data, but especially confidential information must be treated securely. (Fakhruddin, 2017)

Although the travel industry could benefit from incorporating chatbots (White, n.d.), the Kayak Mobile Travel Report (2017) indicates that the majority of British citizens is still unsure about the usage of chatbots. 34% are concerned about data security and almost a third is worried that the chatbot will not be able to understand the enquiry sent. Additionally, 33% believe that a chatbot would give them an incorrect answer. (Kayak Mobile Travel Report, 2017) These aspects could potentially limit the degree to which chatbots are accepted and used amongst customers.

2.6 Economic value

Measuring the economic value of a chatbot is difficult and varies depending on the industry and the individual organisation. One way to do so would include measuring the increase in sales for a shop or the change in website visitors who booked a room for a hotel. The data collected should be compared to the year in which the chatbot has not yet been implemented. The data collection process takes time and needs a lot of resources. (Jessa & Lasek, 2013)

What could be found likely to improve is that a hotel's chatbot implementation may lead to an increase in revenue. However, Jessa & Lasek (2013) suggest that a chatbot can support a hotel's customer service as it provides information and can also help owners to detect a customer's opinion and expectation of the hotel. Furthermore, hotel owners will get the chance to detect certain gaps on their website. Even if a

conversation does not lead to an immediate purchase, a chatbot will store valuable information about potential customers and is therefore, economically seen, priceless.

However, according to Farreras et al. (2015), the mean average words per message length is shorter when humans communicate with a chatbot rather than when they do so with another human, while the average messages sent per conversation are higher. Furthermore, there is also a difference in use of profanity and use of foul words: both of those variables were higher during the human-chatbot conversation compared to the human-human one, all indicating that humans actually communicate differently with chatbots than with real humans and feel more uncomfortable talking to a chatbot. This could possibly lead to a negative effect on a customer's willingness to use a chatbot.

2.7 Capabilities and metrics

There are some chatbot capabilities, functionalities and metrics which are used in this research to determine the effectiveness and usefulness of the different chatbot platforms.

Firstly, some metrics that could be used to determine the usefulness of a chatbot are number of matches per question, which is the number of evaluators who managed to find answers from the chatbot per question asked, and number of matches found per user or in total. (Abu Shawar & Atwell, 2007b)

Additionally, efficient chatbots offer the possibility to schedule the posts and messages. By doing so, they will provide help in planning the marketing activities of a company and will remind the users of changes or news such as special offers, promotions, discounts or new inventories. (Singh, 2017)

In order for companies to be able to measure the results of the chatbots and whether the conversations were successful, a chatbot should provide the company with summaries of the conversations and statistical data. Organisations can use chatbots to conduct data comparison and additional data analytics. (Singh, 2017)

Furthermore, a chatbot can be described as advanced in case it is capable of analysing unstructured data, which represents roughly 80% of all digital data. Organising unstructured data will potentially lead to a better understanding of the users of a company and makes it possible to adapt and change the chatbot. (Hald, 2017)

2.8 Usage

2.8.1 Customer service

Chatbots form a new development of customer service, changing the way a customer's after-sale experience is shaped. Guzman & Pathania (2016) find three main reasons why chatbots are important for customer service.

Firstly, although a chatbot is not able to solve all queries, routine queries, which make up most of all service requests, can be standardised with a chatbot and will deliver a high level of performance. To reach this high-quality output, roughly five weeks of training the chatbot are necessary. Furthermore, chatbots make it easy and fast for customers to reach customer service via messaging services they already use on a day-to-day basis. Many users will therefore be familiar with this type of interaction, turning it into a convenient experience. Lastly, chatbots will provide companies with an insight into the digital customer and will keep them up-to-date with new technology. (Guzman & Pathania, 2016)

2.8.2 Conference information

Besides the general use of chatbots, there has been one virtual agent that was used solely for a touristic use: CLARA. CLARA has been developed to serve as both, a conference information system and a local tour guide, both of which would surely provide useful information and help for first time visitors. (D'Haro et al., 2015)

The architecture of the system is made out of three components, namely the client system, a web socket server and different resources for providing information. A user enters a query using the graphical interface, the application, and the system will then

create a JSON message consisting of the query itself, the domain, deciding between conference or touristic information, and GPS coordinates, in case the user allows the system to retrieve them. Firstly, the system looks for generic questions, similar to Elizabeth, and will retrieve the most similar examples in the index as compared to the user's input. In case no answer can be found in the index, the system will start looking for possible answers either on the conference search engine or the tourist search engine. This cycle is very similar for all kinds of inputs. To provide a final answer, the system sends back the found answer to the mobile application by generating a JSON message, containing information about the feedback, the type, as an answer could be a map, an external website etc., and the URL to be displayed. In case of retrieval of conference information, the system allows the user to look after authors, affiliations, countries, titles, conference sessions and events and general questions about the conference facilities. The system will recognise the input by using fuzzy search algorithms, which are robust to misspellings. Afterwards, the entities extract knowledge from the knowledge bases and the SQL query is generated and used to look for papers, authors or session information in the database. (D'Haro et al., 2015)

During the 15th conference of the International Speech Communication Association in 2014, D'Haro et al. (2015) launched CLARA, making use of the 1200 attendees from 46 different countries. To do so, a free mobile application for both, the Google Play Store and the Apple App Store, was created and was able to display information about authors, the conference schedule, a conference venue map, provide access to the conference's website and even give the possibility to add the conference schedule to the personal calendar. Additionally, the agent screen was available via the application. (D'Haro et al., 2015)

It was found that, generally, users would use the agent screen looking for touristic information more than they would be willing to retrieve conference information. However, it was also discovered that there was a high percentage of queries, about 50%, which the system could not answer, but most of these, 75%, were concerning out-of-domain queries during chat interactions, which the system had problems with detecting an answer for from the index or external websites and was therefore unable to process them correctly. (D'Haro et al., 2015)

2.8.3 Tourism and hospitality

With digitalisation, more and more industries are relocating their main focus to web applications and the internet. The hotel industry has an estimated 75% of all its bookings done online, resulting in an increasing demand for online information provision. (Jessa & Lasek, 2013)

Incorporating a hotel chatbot can decide upon the competitiveness of an individual hotel on the market. A hotel chatbot is solely created for aiming towards a targeted marketing goal, for example increasing sales. Therefore, its knowledge base is limited to hotel information and touristic topics, providing users with information on the hotel itself, the surroundings of the hotel and answers to the most important kinds of touristic queries. (Jessa & Lasek, 2013)

Jessa and Lasek (2013) have implemented a chatbot to a hotel's website and have found some important results. The average conversation length of a chatbot conversation was 4.2 seconds, with a maximum of 118 seconds, while 36% of all conversations consisted only of one user input and 60% of no more than two user inputs. In comparison to more general chatbots, hotel chatbots' conversations are relatively short, which could possibly be explained by the limited knowledge base of a hotel chatbot and the non-existence of small talk. Furthermore, another suggestion for an explanation is that a hotel chatbot is in this case simply an addition to a hotel's website, not an individual tool for booking a room. (Jessa & Lasek, 2013)

The results showed that 56% of all conversations contained queries about the hotel or its offers, while 12% of the conversations reflected questions about the chatbot itself. As mentioned in 2.8.1., the majority of users perceived the hotel chatbot as a person, supporting the ELIZA effect. (Jessa & Lasek, 2013)

According to White (n.d.), Expedia has been a paragon in terms of customer engagement through the use of a chatbot. Its Facebook Messenger allows customers to book a hotel within the chatbot, only being redirected to the website for entering payment details.

Kayak, a travel search engine providing information on flights, hotels, rental cars and package holidays, (<https://www.facebook.com/kayak/>) is another success story of the

implementation of a chatbot. Kayak's chatbot does not only provide full information on these categories, but also proposes different destinations based on the user's preference and offers future updates for the customer via Facebook Messenger. (White, n.d.)

Other companies operating in the field of tourism and hospitality and making use of chatbots include the two airlines KLM (<https://www.facebook.com/KLM/>) and Icelandair (<https://www.facebook.com/Icelandair/>), Bebot offering chatbot concierge for travellers in Japan (<https://www.bebot.io/hotels>) and Aloft hotels using a chatbot to give guests an additional way to make service requests. (Acosta, 2017)

2.9 History

2.9.1 ELIZA

The very first chatbot which was created was intended only to entertain and engage users. Joseph Weizenbaum was first to design such a chatbot in the 1960s called ELIZA in order to be a substitute for a psychotherapist in clinical treatment. (Weizenbaum, 1966, 1967, in Abu Shawar & Atwell, 2007a) Thanks to its use as a psychotherapist, the users often set up a highly emotional relationship with the program, which is described by the ELIZA-effect, assigning chatbots characteristics of human intelligence. (Jessa & Lasek, 2013) ELIZA uses keyword matching, which means that after a certain input, the program will look for matching keywords. If matching keywords are found, the system will construct an answer according to the rules noted for this specific keyword, and if not, a linked remark is recalled. Therefore, ELIZA does not necessarily understand the problems of the users, she only matches the users' answers with her standard responses. In order not to abruptly end the conversation and to stay as human-like as possible, ELIZA tries to keep the chat going by using certain phrases when no keyword match can be found, such as "Very interesting. Please go on.", or "Can you elaborate on that?" and others. (Abu Shawar & Atwell, 2007a)

```

Welcome to

      EEEEE LL      IIII ZZZZZZ  AAAAA
      EE   LL      II   ZZ   AA  AA
      EEEEE LL      II   ZZZ  AAAAAA
      EE   LL      II   ZZ   AA  AA
      EEEEE LLLLLL IIII ZZZZZZ AA  AA

Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

ELIZA: Please tell me what's been bothering you.
YOU:   I don't know exactly what to write about you.
ELIZA: Don't you really know exactly what to write about I ?
YOU:   No, I don't.
ELIZA: Why 'no' ?
YOU:   Because it seems a difficult task.
ELIZA: What other reasons might there be ?
YOU:   None, seems like the only one.
ELIZA: I'm not sure I understand you fully.
  
```

Figure 1. Screenshot of a conversation with ELIZA

Figure 1 well portrays the function of ELIZA. As described above, in this conversation, ELIZA uses the input, re-phrases it and simply exchanges the personal pronouns for matching ones.

2.9.2 Elizabeth

An adaption of ELIZA is the so-called Elizabeth, which has been enhanced to create higher flexibility and has therefore created a higher chance of providing an accurate and appropriate answer. (Abu Shawar & Atwell, 2002)

Elizabeth stores knowledge in a script file format, where each line starts with a script command notation in order to distinguish the individual types of knowledges. The notations are as follows (Abu Shawar & Atwell, 2002):

- W, a welcome message
- Q, a quitting message
- V, a void input
- I, an input transformation
- K, a key word pattern

- N, a key word response pattern
- O, an output transformation
- M, a memorised phrase
- &, an action
- /, a comment

A script file may be composed of a maximum of 4 parts (Abu Shawar & Atwell, 2002):

Part one includes all responses concerning welcome, void and no key word messages.

Example:

W: HELLO, I AM Elizabeth. HOW MAY I HELP YOU?

V: DO YOU HAVE ANYTHING ELSE TO SAY?

N: TELL ME WHAT YOU LIKE DOING? (Abu Shawar & Atwell, 2002)

Part two includes input transformation rules, transforming a given input.

Example:

I: Granny > grandmother

I: Grandpa > grandfather

If a user inserts “granny” into the system, it will be automatically changed to “grandmother”. Input transformation rules have to be written in lower case.

Part three includes output transformation rules, which change personal pronouns to give an appropriate response.

Example

O: we are > you are

O: we > you

O: our > your

Part four includes key word patterns, matching a line starting with “K” with an answer starting with “R”.

Simple example

K: MOTHER

R: TELL ME SOMETHING ABOUT YOUR FAMILY

Composite example

K: I BELIEVE [phrase]

R: WHY DO YOU BELIEVE [phrase]?

Pattern matching is done in five phases:

Step 1: Input transformation matching

Step 2: Keyword pattern matching

Step 3: Output transformation matching

Step 4: Void or No keyword messages matching

Step 5: Dynamic Processes, referring to performing actions which change the script while the conversation is in progress. (Abu Shawar & Atwell, 2002)

2.9.3 ALICE

The Artificial Linguistic Internet Computer Entity, ALICE, was created and first used by Richard Wallace in 1995. Different to the simple keyword matching ELIZA uses, ALICE stores its knowledge about English conversation patterns in AIML files, Artificial Intelligence Mark-up Language. (Artificial Intelligence Foundation, 2007; Abu Shawar & Atwell 2003; Wallace, 2003 in Abu Shawar & Atwell, 2007a)

These AIML files are comprised of data objects called AIML objects, which again, consist of units called topics and categories. The topics have a name attribute and a set of categories related to this specific topic, while categories refer to the basic unit of knowledge in AIML. Each single category serves as a rule for aligning the user's input to the desired output, while also consisting of a pattern and a template.

```
<aiml version="1.0">
<topic name="the topic">
<category>
<pattern>PATTERN</pattern>
<that>THAT</that>
<template>Template</template>
</category>

</topic>
</aiml>
```

The `<that>` tag is not required, yet important, as it means that the current output is dependent on the previous in- and output. (Abu Shawar & Atwell, 2007a) Each element has an open and close tag. (Abu Shawar & Atwell, 2002) The AIML pattern is rather simple and is made up of only words, spaces and the wildcard symbols `_` and `*`. The basic concept of the pattern matching technique is to match the input with the longest pattern match. (Abu Shawar & Atwell, 2007a)

There exist three different types of ALICE/AIML categories. (Abu Shawar & Atwell, 2002)

- a. *Atomic categories* are those where the pattern does not have any wildcard symbol.

```
<category>
  <pattern>5 Pounds</pattern>
  <template>That seems like a fair
  price</template>
```

```
</category>
```

As displayed above, if the user's input is "5 Pounds", ALICE replies with "That seems like a fair price".

- b. *Default categories* refer to any categories that do have a pattern with a wildcard symbol. Assuming the input is "5 Pounds" again, but the system does not find the matching category (as shown in a.), then it will look for a category with a default pattern like the following one.

```
<category>
  <pattern>5 *</pattern>
  <template> This is five</template>
</category>
```

In this case, ALICE replies "This is five".

- c. *Recursive categories* are categories which include `<sr>` and `<sr>` tags, referring to recursive reduction rules. Recursive categories either reduce grammatical complexity to simpler forms, divide inputs into two or more parts and combining the response for each individual one and look for synonyms in order to find an appropriate answer.

c1. Symbolic reduction

```
<category>
  <pattern>DO YOU KNOW WHAT THE *
  IS</pattern>
  <template>
    <sr>What is<star/></sr>
  </template>
</category>
```

Above, `<sr>` is in use in order to simplify the input to "What is *".

c2. Divide and conquer

```
<category>
  <pattern>YES*</pattern>
  <template>
    <sr>YES</sr>
    <sr/>
  </template>
</category>
```

As shown above, the input is divided into two parts and the "*" is matched with the `<sr>` tag. `<sr/>=<sr><star/></sr>`

c3. Synonyms

```
<category>
  <pattern>HEY</pattern>
  <template>
```

```

        <srail>Hello</srail>
    </template>
</category>

```

Above, the input is mapped to a different word with the same meaning. (Abu Shawar & Atwell, 2007a)

In other words, if a chatbot should answer “Hello Marcus, how can I help you?” to “Hello”, the AIML category should look like the following:

```

<category>
<pattern>HELLO</pattern>
<template>Hello Marcus, how can I help you?</template>
</category>

```

Assume the following categories:

- a.

```

<category>
<pattern>_HOW ARE YOU</pattern>
<template>
<sr/> <srail> HOW ARE YOU</srail>
</template>
</category>

```
- b.

```

<category>
<pattern>HELO</pattern>
<template>
<srail>HELLO</srail>
</template>
</category>

```
- c.

```

<category>
<pattern>HELLO</pattern>
<template>
<random>
<li>Heya!</li>
<li>Hey there!</li>
<li>Hello there!</li>
<li>Hello, fancying a talk?</li>
</random>
</template>
</category>

```
- d.

```

<category>
<pattern>HOW ARE YOU</pattern>

```

```
<template>
<random>
<li>Everything is great.</li>
<li>I am absolutely fine, what about you?</li>
<li>Good, thanks.</li>
</random>
</template>
</category>
```

If the user's input is "Helo, how are you?", the system will possibly reply with "Heya! Good, thanks.". (Abu Shawar & Atwell, 2002)

The matching process is done as follows (Abu Shawar & Atwell, 2002):

Step 1: The input is divided into two parts. The first sentence, "HELO", is made distinctive with the <sr/> tag, while the second one, "HOW ARE YOU", is a reduction of the original output, done by using the <sr/i> tag. The system looks for pattern matching those two sentences.

Step 2: "HELO" will be substituted by "HELLO" in category b and matched with category c, where the answer will be selected randomly from the list provided.

Step 3: Similar to the second part of step 2, the second sentence will be matched with category d and one of the answers will be selected randomly again.

Step 4: A combination of the two appropriate answers will be done and displayed by the AIML interpreter. (Abu Shawar & Atwell, 2002)

3 The ÖAMTC

3.1 Facts

The Österreichische Automobil, Motorrad und Touringclub, the ÖAMTC, the Austrian Automobile, Motorcycling and Touring Association, is, according to their website, the largest automotive club in Austria and the seventh biggest worldwide and works as an independent and international association. Its offers include breakdown and emergency assistance, both in Austria and abroad, legal advice, technical services, insurance services, travel information, preferred partners and much more. (Leistungen des ÖAMTC, n.d.)

According to its statutes, the ÖAMTC understands itself as a reference person and promoter of all interests of its members concerning the topic of mobility. It is an economically and politically independent and non-profit organisation. The aim of the ÖAMTC is to encourage mobility with respect to social responsibility, conservation of resources, balance of opposing interests between individual mobility and environment protection, and development of respect of all traffic participants for each other. Additionally, one of the major goals of the ÖAMTC is to support emergency services and the assistance in cases of need. Another desire is to encourage juveniles in leisure, sport, recreation and education in accordance with the ÖAMTC's other goals. The ÖAMTC is a member of the Fédération Internationale de l'Automobile FIA, the Alliance Internationale de Tourisme AIT and the Fédération Internationale Motocycliste FIM.

The headquarter of the ÖAMTC was built and opened in 2016, located in the Baumgasse 129 in Vienna's 3rd district and accommodates, according to the architect's partner FCP, an office area, support functions, membership services and a heliport.

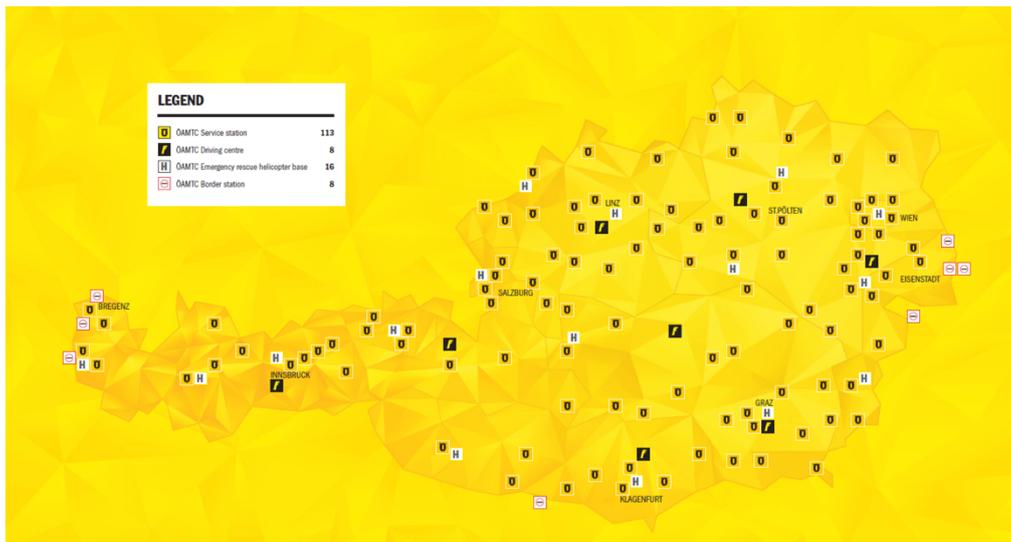


Figure 2. The ÖAMTC's Service stations, Driving centres, helicopter bases and border stations (ÖAMTC Annual Report, 2016)

3.2 Memberships and numbers

The ÖAMTC offers a few different types of memberships.

The car membership includes all services, car, motorcycle and touring (bike, bus, train), the motorcycle one excludes car services and the touring membership includes only touring services. Children of members aged up to 14 years will have the possibility to get a free touring membership, while all teenagers aged between 15 – 19 can receive a free car membership.

In addition to the standard memberships, the ÖAMTC offers the assistance booklet, which covers vehicle recovery, towing service, repatriation of sick or injured persons, helicopter rescue and medical services in Austria and abroad. The assistance booklet is applicable in Austria, all European countries and some more, including the Russian Federation, the Mediterranean islands and the Canary Islands. (ÖAMTC Annual Report, 2016)

As stated in the Annual Report of the year of 2016, the ÖAMTC had approximately 2.1 million members in the respective year, excluding the ones owning a free membership.

In 2016, the ÖAMTC registered 686,802 roadside assistances and 51,128 emergency road services abroad. The so-called “Christophorus”, the rescue helicopters, started 17,814 times and 118,300 participants attended safe driving trainings. (ÖAMTC Annual Report, 2016)

As the main duty of the ÖAMTC is the emergency roadside assistance, it has several call centres in all of Austria, handling calls from its members. The biggest one is the call centre in Vienna, the so-called NIS East, which handled over 1.7 million calls in 2016, which comes up to 4,600 calls daily for the 266 call centre employees. It organised over 300,000 roadside assistances in Vienna, Lower Austria and the Burgenland in 2016 and nearly 250,000 other services. (Mein Club, 2017)

3.3 History

The two forerunners, the “Österreichische Touring-Club”, ÖTC, and the “Österreichische Automobilclub”, ÖAC, were originally founded in 1896, but abolished in 1938 due to the Annexation of Austria and re-set up after the 2nd World War and unified in December 1946. (ÖAMTC Geschichte, n.d.)

3.3.1 The Österreichische Touring-Club

According to its intranet, on October 24, 1896, an appeal was made in the magazine for cycling and athletics to establish the ÖTC. Around that time, approximately 11,000 cyclists already existed solely in Vienna, however, only few people had cars.

The first constituted general assembly was held on March 30, 1897, when the ÖTC had 650 members, five months later however, it already had around 2,000. The goal was to support cyclists that used their bikes apart from the already well-organised professional races for individual use. Some first implementations were the creation of bikeways, the building of help stations and the improvement of boarder traffic. Furthermore, some achievements were made like the possibility to transport bikes via train, the issuance of touring cards and maps, and the arrangement of street signs.

Also, the first premiums for accident and indemnity insurances were made. (Baaz-Eichhorn, 2016)

3.3.2 The Österreichische Automobil-Club

The ÖAC was founded on February 6, 1898, when there were only 15 gas-operated automobiles in Vienna. The majority of its 206 members were aristocrats, Grand Burghers and manufacturers, whom would all see the early potential of individual transport. Back then, the main aim was to support automobiles and ensure the necessary regulation of road traffic through the ÖAC's car rental, the creation of gas stations and driving courses, the organisation of races and the issuance of touring sets. (Baaz-Eichhorn, 2016)

3.3.3 1914-1946

There were around 6,000 cars in Vienna before the 1st world war, out of which around one fourth were taxis.

The 1st world war turned out to be a major setback for the automotive industry, which was also strongly noticeable for the ÖTC and the ÖAC. It was not until the 1920s, when the automotive industry started getting back to the pre-war period and when motor vehicles began to play a big role in daily life. It was around that time, that the ÖTC started to turn towards motorcyclists and car drivers. At the end of the 1920s, the Austrian automotive industry was booming: 20,000 cars and 40,000 motorcycles were registered.

The ÖTC and the ÖAC separately implemented new achievements, such as the improvement of roads, the sale of first aid packages, comprehensive touristic services for members and first plans for the introduction of emergency rescue.

In 1935, the two clubs decide upon its first step towards a future cooperation. The consortium, the ÖATC, was set up in order to achieve higher efficiency and faster outcomes, while both clubs stayed independent.

A few days after the National Socialist takeover in March 1938, the ÖTC and the ÖAC were forced to be closed. At that point of time, the ÖTC had around 30,000 members and the ÖAC 18,000. (Baaz-Eichhorn, 2016)

3.3.4 Since 1946

After the end of the 2nd world war, both clubs were reorganised and were merged on December 17, 1946, to become the ÖAMTC. Since then, the following events happened (Baaz-Eichhorn, 2016):

1947. The first issue of the magazine Auto-touring was published.

1951. The first technical checking service was started at a garage in the 5th district of Vienna.

1954. This year counts as the birth of the mobile breakdown service and the milestone of 100,000 members was achieved.

1959. The assistance booklet was introduced.

1968. The 24-hour breakdown service was established.

1971. The ÖAMTC reached 500,000 members.

1973. The permission of conducting the § 57a motorway permit sticker check was awarded to the ÖAMTC.

1981. The ÖAMTC introduced its club card.

1983. The first emergency rescue helicopters started its operation in Innsbruck and Krems.

1990. This year marks the achievement of 1 million members.

1995. The ÖAMTC becomes the first European mobility club to be represented in the web.

2001. The emergency rescue helicopters are now operating nationwide.

2007. 1 million members are now also in possession of the assistance booklet.

2015. This year, the ÖAMTC passes the 2 million members mark and introduces the e-bike breakdown assistance in Vienna.

2016. The ÖAMTC celebrates its 120th anniversary.

3.4 The ÖAMTC as an employer

Mag. Christoph Mondl, the former CFO and deputy CEO at ÖAMTC stated the following:

“The ÖAMTC is an association from people for people. Motivated and well-educated employees are our key to outstanding service. Hence the ÖAMTC is willing to provide its employees an attractive work environment at any time. We want to support them during important stages of life like during parental leave and make sure, they return to professional life with their knowledge and experiences slowly but surely.” (Unsere Partner, n.d.)

According to the Annual Report (2016), the ÖAMTC had 3,741 employees in 2016, all of which adhere to the employee guidelines as follows:

- Reliability
- Rapid response
- Competence
- Accessibility
- Courtesy
- Comprehensibility
- Credibility
- Understanding
- External impact

3.5 Innovation at the ÖAMTC

Over 120 years ago, there were two associations which had the common goal to support their members concerning mobility. Ever since then, many years have passed and the ÖAMTC has evolved to become a highly innovative association which tries to focus on the future of mobility on a day-to-day basis. (Fischer, 2018)

The fact that the ÖAMTC is focusing on the future development of mobility can also be approved when looking at the innovation and mobility department. This executive department forms part of the general secretariat and analyses current and future trends and accompanies developments at the ÖAMTC across all departments. (Moosbeckhofer, n.d.)

However, changes in mobility do not only concern the innovation department, but all departments at the ÖAMTC. Therefore, many changes have been made towards a more innovative development of mobility, some of which include the ones presented below. (Fischer, 2018)

One of the major developments of the ÖAMTC has been the introduction of a 24-hour helicopter emergency rescue service, which has been in use for the C2 in Krems. Furthermore, the roadside assistance was revolutionised by introducing e-bike roadside assistance in Vienna. This idea has been adopted in several countries, including Germany, the Netherlands, Switzerland and the USA. Another step was the creation of “Connected Car” and with that, the development of an OBD on-board diagnosis plug which allows the reduction of roadside assistances by detecting issues early, making use of predictive service, e.g. if the car battery’s voltage is too low. This idea has already been adjusted and introduced in Australia, the United Kingdom and the Netherlands. The ÖAMTC has also seen drones as one of the major developments of the last years and has therefore introduced a drone security package, which includes a mobile application, a drone training and indemnity insurance. (Fischer, 2018)

The most recent and most successful project was the ÖAMTC Startup Challenge, which started in August 2017 and supplies the winners with an office space at the ÖAMTC

headquarter and the help and large network of the company. (Kumnig, 2017) Three start-ups won the competition, as follows:

- (1) Projekt Volare developed a highly-automated aircraft which can be used for individual transportation of passengers.
- (2) Roomchooser is a start-up focusing on providing a booking portal for barrier-free hotel rooms.
- (3) BikerSOS is a mobile application which is able to identify accidents of motorbikes and can automatically call emergency help – either a private contact person or an institution like the ÖAMTC. (Kumnig, 2017)

All three start-ups build part of the highly innovative corporate culture at the ÖAMTC and fit perfectly with the idea of developing and changing mobility. (Kumnig, 2017)

This is where a chatbot could form part of the innovative aspect of the ÖAMTC. According to Markus Matzak-Precht, Executive Partner Automotive at IBM Germany, top challenges for all industries include the growth of health data, out of which 88% is unstructured, insurance data, 84% unstructured, automotive data, 84% unstructured, and the growth of manufacturing data, 82% unstructured. Developments concerning the automotive industry include the connected car, connected retail, electric car, intelligent car and autonomous driving. Intelligent data evaluation is and will be key for success, particularly concerning unstructured data. Cognitive systems provide more intelligent business insights than traditional systems, being characterised by an understanding of unstructured data, including Natural Language Processing of written word, vocal and visual data, reasoning and learning. (Matzak-Precht, 2017)

3.6 The RMS department

The RMS department, short for Reise- und Mobilitätsservice, translated travel and mobility services, was former called Touristisches Informations- und Produktmanagement TIP, touristic information and product management, and is a department at the ÖAMTC, responsible for the touristic content of the ÖAMTC.

Its functions and offers include:

- (1) Online route planner: The route planner offers trans-European routing for a vehicle of individual choice. While doing so, it is able to calculate up to ten stopovers and will provide full detail about the current toll charges, the exact number of kilometres and the itinerary. This service is available to anyone, not just logged-in members, and is offered for free. (Sunjic, 2012) In 2017, approximately 1.45 Million users used the route planner and around 3.95 Million routes were calculated. (Leistungsbericht ÖAMTC, 2017)
- (2) Country database: The country database offers detailed information about all countries of the world. These include information about breakdown and emergency services, climate and best time for travelling, health and vaccinations, accommodation and suggestions for excursions, necessary documents, security, tolls, traffic rules, public holidays and much more. (Dworak, 2015) In 2017, the country database had around 930,000 users. (Leistungsbericht ÖAMTC, 2017)
- (3) City Guide: The City Guide is a service offered by the ÖAMTC which provides information and tips for many European cities. These tips include sights, journey or arrival, public transport, city cards, parking and many more. The City Guide is available online or via the City Guide App for iOS and Android. (Sunjic, 2012) As of December 2017, 30 cities are available. The City Guide app was downloaded nearly 130,000 times between May 2012 and December 2016. (Teuschl, 2016) In 2017, the City Guide website and the app had over 162,000 users. (Leistungsbericht ÖAMTC, 2017)
- (4) Travel checklist: The travel checklist is a packing list that gives users the ability to make individual adjustments. These include type and length of stay, fellow passengers and the mean of transportation. Furthermore, some pre-defined packing lists are available, e.g. for a holiday at the seaside. (Sunjic, 2012) The travel checklist had more than 41,000 users in 2017. (Leistungsbericht ÖAMTC, 2017)
- (5) Travel info set: The travel info set is a usually yearly-revised country- or region-specific brochure which includes detailed information about cities and countries, touring plans, travel maps, city plans and much more. (Sunjic, 2012) It is available for most regions of Europe, the USA, Canada, Australia and New

Zealand, is offered at all ÖAMTC offices, and serves as a member-only service, which is for free. (Dworak, 2015) In 2017, over 138,000 travel info sets were handed out. (Leistungsbericht ÖAMTC, 2017)

- (6) Travel information papers, touristic brochures, training documents, workshops, cooperation with tourist boards and handling enquiries: These duties include letters of authorisation for children travelling alone, documents about rights before, during and after a trip, information about low-emission zones in Germany and driving bans in Italy, dictionaries for allergies in ten different languages and much more. Furthermore, many press releases and interviews were held concerning tourism issues. (Dworak, 2015)

The RMS department is trying to achieve higher performance on a daily basis. As of 2017, the department's goals were the following (Dworak, 2017):

Generally, the aim is to reach a higher number of users, shift the proportions of new users and returning users, to increase the number of new registrations and users of touristic services at "Mein ÖAMTC" and to increase the number of conversions achieved through touristic services.

- (1) Travel application: The RMS department will soon launch the travel app and would like to achieve a high number of downloads and to offer emergency relief via the app. Until the travel app will be launched, all goals above apply to the City Guide app.
- (2) Route planner: Some ambitions with regards to the route planner include the ability to be able to differentiate between internal and external users and between anonymous and registered users, and to increase the number of registered users' use of the route planner.
- (3) Travel checklist: Similar to the route planner, the desire is to be able to differentiate between anonymous and registered users.
- (4) Country database: Concerning the ÖAMTC's country database, the aim is to be able to directly offer newsletter subscriptions of the country news.

4 Methodology

The most popular and known chatbots are ones that require programming and are able to process natural language in order to reach an accuracy of understanding queries of 90%. However, as these kinds of chatbots require a lot of resources and extensive knowledge, the chatbots used for this analysis are such with no coding requirements, i.e. where each possible input and the associated outcome are put into the system manually. Another reason is that as the ÖAMTC is located in Austria and its operational language is German and many chatbots do not support a German version, so finding a matching chatbot could become a difficult task, especially with a certain budget in mind.

To find out which inputs and outputs are needed and important, interviews with employees of the travel and mobility department at the ÖAMTC were conducted. Those interviews covered topics related to the enquiries received and are held in German and later translated to English, see Appendix. The main focus is to find a scheme for all types of enquiries, provide a list with the topics that can be handled by the system and the ones that require an expert and possibly reduce the time invested into handling those enquiries or trying to find the best contact person.

To do so, after conducting the interviews, the results were converted into inputs and outputs and the chatbots were set up with those. An explanation of each individual chatbot program is provided, alongside with its individual features and pricing, if relevant. The used chatbots are ones that are to be incorporated on Facebook pages only.

Afterwards, a personal examination of the chatbots will be done and presented in terms of easiness to set-up, the general layout and usefulness and a list of each of the chatbots' capabilities and functionalities will be prepared. By evaluating both, the usability to set-up of the chatbot and the usability of the chatbot itself, an appropriate decision is made as for which of the chatbot programs should be used by the ÖAMTC's travel and mobility department.

5 Interview results

Two interviews with the head of the RMS department, Ms Mag. Dworak, and Ms. Mag. Tauer, an employee, were conducted and the outcomes have shaped the decision-making process concerning chatbots.

The travel and mobility department receives mainly complex enquiries which are mostly hard to be standardised and put into a chatbot. According to Tauer, some enquiries concerning the route planner could possibly be standardised as they require no research. However, these simple enquiries are a minority at the RMS department. This aspect, nonetheless, is only applicable to this specific department, as other departments receive different enquiries, out of which some are touristic related as well.

Although the majority of enquiries received at the RMS department are complex, the time invested is manageable as the number of enquiries is rather low. However, there is a seasonal peak between the Easter holidays and September when more enquiries are sent.

Dworak has been thinking about implementing a chatbot and, together with the project team, has decided to abandon a chatbot and introduce a chat service, i.e. an interface for customers to communicate with the ÖAMTC via chat.

The project is currently at the beginning phase and is to be implemented as a pilot project for the country database by the end of February 2018. Afterwards, the chat service will be tested for six months and later either be adapted or abandoned, depending on the outcomes and satisfaction of both, the customers and the employees. However, it is to notify that as of April 2018, the chat service was not yet implemented due to launch of the travel app.

The reasons the project team decided against a chatbot are quite straight forward. Firstly, they have tried out several players on the market and have found the results to be insufficient, especially because the desired language is German and many chatbots are English-only. Furthermore, Austria has many different dialects and the chatbot was simply unable to identify any dialect words used. Additionally, the

ÖAMTC has four call centres all over Austria and has sufficient personal resources to handle all complex enquiries. This imposes the question why they should risk using a chatbot that is currently still insufficient of solving the problems as good as an employee can. Lastly, it is at this point difficult to know which enquiries will be sent concerning the country database, so creating a sufficient input-output-structure is challenging. Additionally, the time-saving argument is rather weak as an estimated 15-25% of all enquiries are standardisable and relevant to be answered by a chatbot.

At the ÖAMTC, the human being is always in the spotlight, both, on the customer's side, as well as on the employee's side, which would be a reason against a chatbot and for a chat service. However, Dworak realises the importance of going along with the zeitgeist and enabling customers to receive a quick answer without having to call someone or write a formal email.

Using a chat service will shape the future because emails will get less over time and the ÖAMTC sees a need for enabling their members to ask questions quickly and open a new channel of communication. Even though this could possibly imply more work for the employees as the customers expect a quick answer, Dworak believes those aspects will be offset by a higher satisfaction amongst customers.

5.1 Summary

Some principle reasons for the ÖAMTC's decision against a chatbot can be summarised as follows:

- The majority of enquiries received by the RMS department are complex and difficult to standardise.
- Dworak believes a too high percentage of enquiries would not be understood.
- According to Dworak, the tested chatbot providers produced insufficient results. Furthermore, she assumes this is also due to the fact that chatbots are not as advanced in German as they are in English.

- Dworak is certain that a chatbot would be unable to understand the different Austrian dialects.
- Tauer presumes that as the number of enquiries received are rather few compared to other service industries, the overall time saving of implementing a chatbot would be negligible.
- Creating a flawless input-output-structure would take up a lot of time.
- The ÖAMTC has enough staff to handle all enquiries on a timely basis. Therefore, introducing a chatbot will be unnecessary.

Based on the findings from the interviews conducted, high importance was drawn to addressing if any or all of these perceived problems may be resolved by current chatbot implementations during the evaluation of the chatbots.

6 The chatbot platforms

Chatbots have been originally made for websites only, but have now spread across different messaging apps like Telegram, Kik and Facebook, the latter of which the chatbots used in this analysis will be applied to. Those adopted bots are automated accounts from organisations trying to provide their users with news, entertainment or information through the chat. (Russell, 2016)

Generally, chatbots are described as a computer application designed to conduct a dialogue with the user, using Natural Language Processing. (Jessa & Lasek, 2013) This means that those chatbots are programmed in a way that they will save the newly learned input and later derive possible solutions for solving input that was yet unknown. Therefore, it will keep on learning from the natural language input and will become more precise over time. However, as these chatbots require extensive knowledge and many other resources, three of the four chatbot platforms used here are ones that offer a so-called self-service platform, meaning that the inputs and outputs have to be created manually. This is a popular version of creating a chatbot since many of those are for free and require no coding. (Russell, 2016)

Typically, such chatbot applications have five common interfaces, as listed below (Iurchenko, 2013):

Onboarding. When starting a conversation with a chatbot, there is a Welcome message. This feature is usually restrained to a certain number of characters only, limiting the introductory part of the bot. It should be used to explain what the chatbot is for and what it can help the user with. As explained by McCall (2017), companies should stay honest and not try to hide from the user that they are talking to a chatbot. Additional buttons can be used for a better message structure and a faster enquiry handling process. Thanks to the amount of personal data on Facebook, the onboarding message can be personalised easily. There also exists a default message for the occurrence of the chatbot's failure to find the correct answer which is structured similarly.

Messaging. The messaging part covers all the possible answers that will be put into the system and their respective response. Those responses can include not only text, but also images, videos, audios and general files. Emoji, smileys and emoticons can be added as well and have, according to Ondrisek (2016), proved to add personality and depth to a chatbot and therefore improved a user's experience when general misconceptions and cultural differences are taken into consideration. To eliminate the problem of a non-matching result, structured messages can be sent. In result, users will be asked to choose a fitting button and will be provided with an appropriate answer.

Navigation. The navigation, also called the persistent menu, will appear automatically if the user returns after some minutes away from the chatbot. The goal of the persistent menu is to try to keep users engaged and keep them from getting lost.

Templates. Facebook offers several templates, including receipts or lists for an e-commerce activity and many more.

Buttons. Depending on the chat history and outputs, companies can provide users of the chatbot with several buttons to choose from, including a URL button, a buy button and a share button. As the first three seem clear, there are also two buttons that might lead to confusion. The web view button will make it possible to show the chatbot's information in a different format than on Facebook Messenger, supporting HTML, CSS and JavaScript. When the chatbot requires particular information from the user, it will make use of the quick reply button, having the possibility to load it with a maximum of five answers to choose from. Once the user has chosen his answer, the chatbot will remember the information and the answer will not be changeable.

6.1 Chatfuel

Chatfuel is a free self-service platform, offering additional features for a monthly fee of 30 USD. Founded in summer 2015, it has expressed its goal as making bot-building easy for anyone. Their first messenger used was Telegram and they later, after a grand

success thanks to millions of users, added their chatbot service to the Facebook Messenger. (What We Do, n.d.)

Chatfuel's website is simple, yet appealing. It is very easy and quick to find what you are looking for thanks to their compromised tabs. In order to build a chatbot, the creator of the bot has to log in. Chatfuel will ask and redirect the creator to Facebook if he was already registered before, handling the task in a rapid manner, just as quick and easy as the navigation through the website. After continuing and accepting the log in via Facebook, the creator will be led to a similar looking website, but with different navigation tabs. This is the stage where the first problem for Mac users may occur. As a Safari user, the creator is facing some troubles with the compatibility, which as a suggestion, should be substituted with Google Chrome in order to work perfectly with Chatfuel.

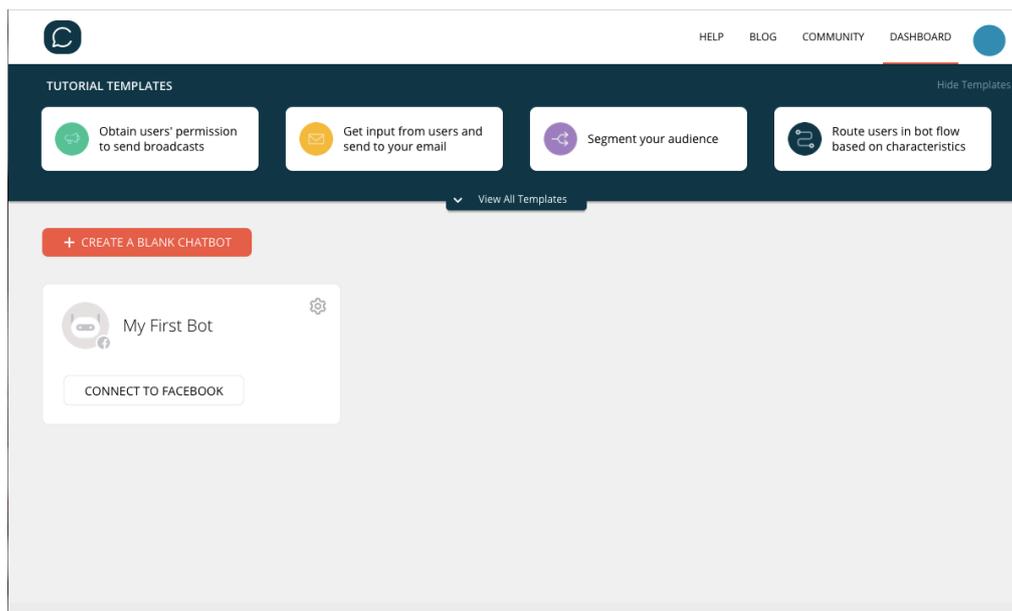


Figure 3. Screenshot of Chatfuel

Once the dashboard is opened, it gets rather easy. Naturally, it is required to own a Facebook page, as it is not possible to build a chatbot without one. However, one can for now simply create a blank chatbot, meaning that it will get connected to the Facebook page at a later point of time. Chatfuel even offers some tutorials templates of which creators can make use of.

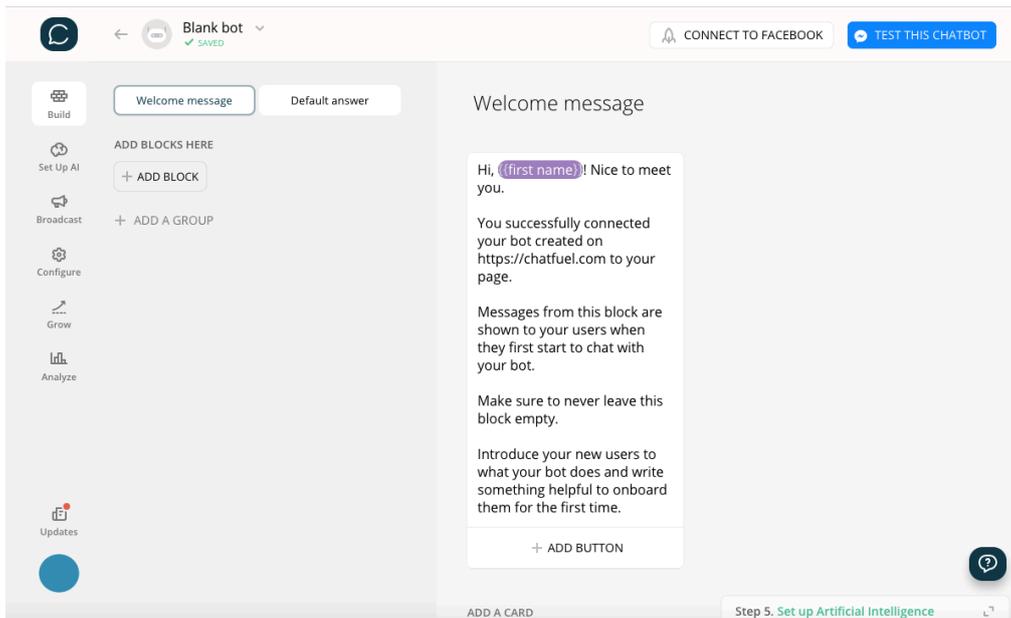


Figure 4. Screenshot of Chatfuel

Once a Facebook page or a blank bot is chosen, creators will be faced with setting up the outputs and inputs, as seen above. On the left, there are different actions one can take. They help creators build the chatbot and set up AI and offer many features. For example, one could ask to unsubscribe from a newsletter and the chatbot will be able to do so for the user. Furthermore, the menu offers tools in order to help creators to analyse the chatbot and to make it grow.

The most important part is to build the chatbot and to do so, the first part is to create a welcome message, that is messages shown to the user when they first start the conversation, and a default answer, meaning an answer for when the chatbot does not understand the user.

Thank you for your enquiry. A member of staff will look closely into your case.

Please, if you wish so, try to solve it yourself and choose a quick reply below.

Figure 5. Default answer

Creators can connect the welcome message to a quick reply, which is linked to a certain block, providing the correct answer. The user will therefore find suggestions instead of typing his answer by himself and errors will be eliminated. When using blocks, creators have the possibility to add a text, images, galleries and many more and to connect those ones with a URL or even a buy button.

However, some sets of enquiries require the set-up of Artificial Intelligence, meaning to create inputs and match them with outputs. Certain inputs can be matched with a text as an output or a block, as described above. An added AI rule will therefore consist of the inputs in green and the outputs, e.g. blocks in grey. This has to be done individually for all possible outputs.

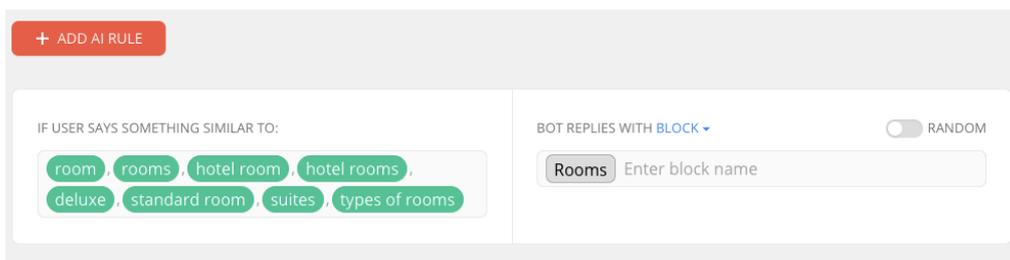


Figure 6. Screenshot of Chatfuel

Another feature of Chatfuel is broadcasting, sending information to the users. Those users can, if desired, be filtered and the messages to be delivered can be scheduled for a certain date and time. This provides a good way for a company to reach all users and therefore, potential customers.

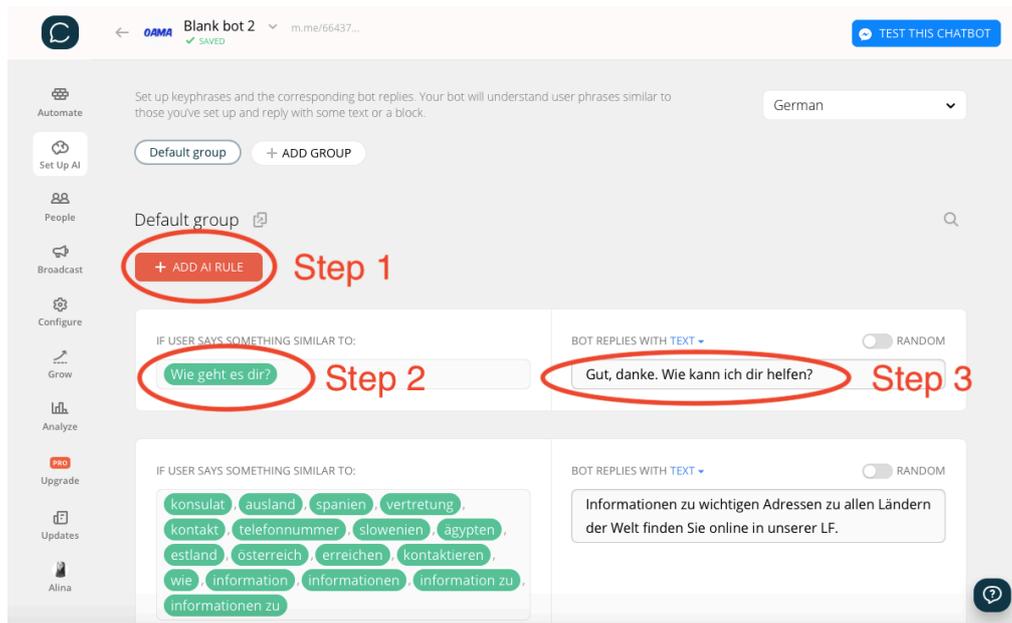


Figure 7. Steps to associate input with output for Chatfuel

Figure 7 depicts the steps required to create a rule and associate input with output on Chatfuel.

Step 1. An AI rule has to be added.

Step 2. Phrases, sentences or sets of keywords a user could put into the conversation can be added. Thereby, Chatfuel offers the possibility to make use of keyword-matching, ensuring that the input provision does not have to be exact and providing more flexibility to interpret text.

Step 3. One or more output possibilities can be added.

6.2 Botsociety

The structure of Botsociety's website is quite similar to Chatfuel's. It is fairly easy to handle and work with. Botsociety supports Facebook Messenger, Slack and Google Home, and offers many different features to allow individual design for each chatbot created. (Botsociety Features, n.d.)

First, one chooses the Facebook page to which the chatbot should be applied to, after which the main menu will open. Other than Chatfuel, Botsociety's website consists of a simple one-page design, which does not require the switching of sites while setting up the chatbot, which in turn makes the creation rather easy.

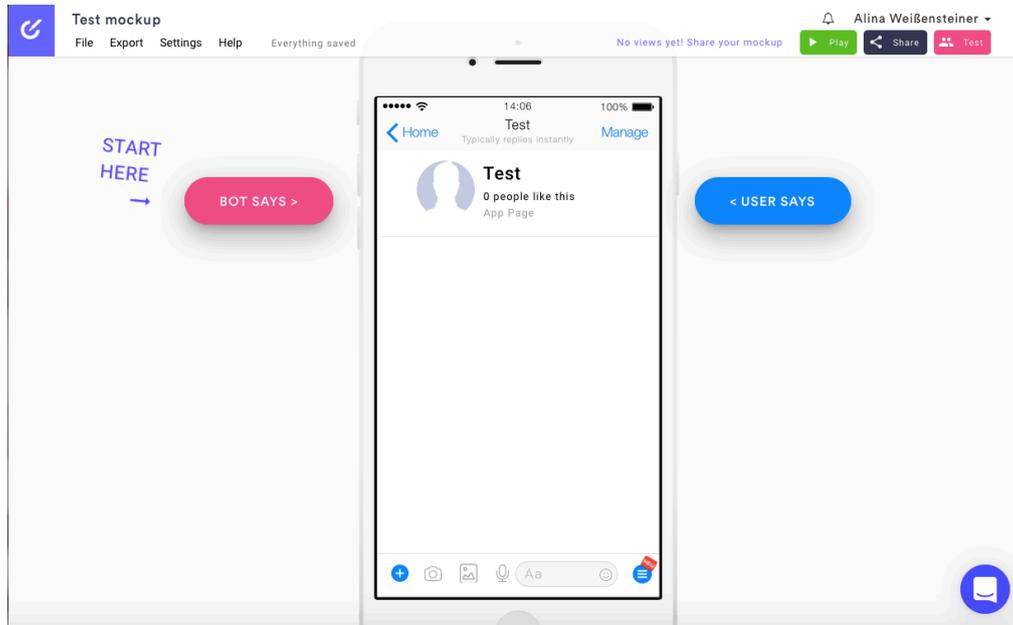


Figure 8. Screenshot of the menu of Botsociety

Botsociety is structured into two major parts: the bot says, or outputs, and the user says, the inputs.

The “bot says” section is the part where the creator can enter all inputs required and structure the data. Standard text messages, images, buttons and quick replies make the creation of the chatbot’s output simple.

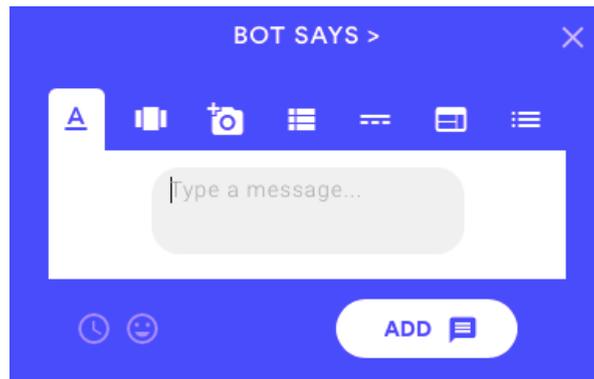


Figure 9. Bot says

The “user says” section enables the creators to enter the input into the chatbot. Text messages, images and locations can be shared; voice messages will be enabled soon as well.

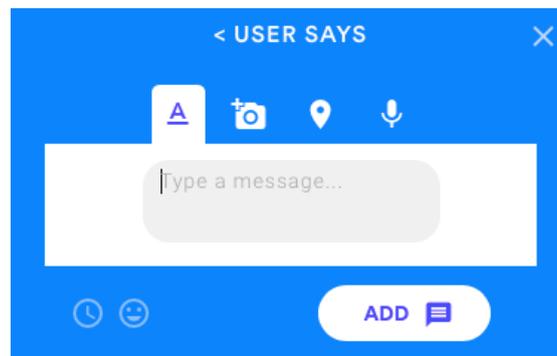


Figure 10. User says

Once inputs and outputs are put into the system, they can be matched. The fact that the creator can see the outlook immediately while setting up the chatbot makes it easy to imagine what the future conversations will look like.

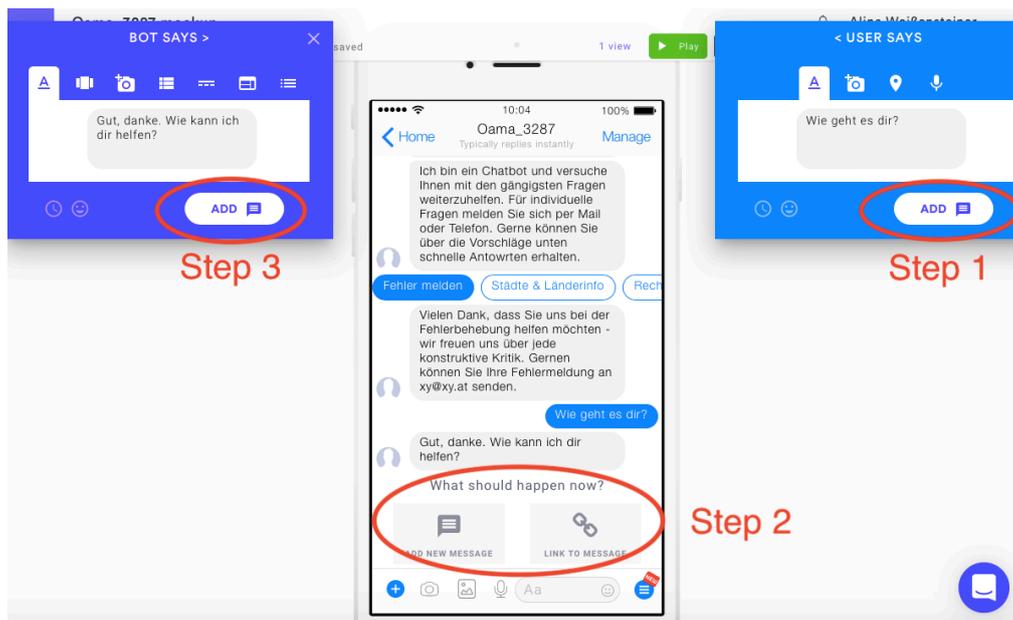


Figure 11. Steps to associate input with output for Botsociety

Figure 11 depicts the steps required to associate input with output on Botsociety's chatbot.

Step 1. An input has to be provided, to which the user's real input has to correspond exactly in order to be matched. Naturally, this limits the accuracy of the provision of results because it is almost impossible to provide all potential inputs exactly.

Step 2. A link has to be set to the corresponding output.

Step 3. The corresponding output has to be created.

6.3 ItsAlive

ItsAlive is a less known chatbot creation platform, which offers a free self-building chatbot and solutions for organisations which prefer not to build the chatbot themselves. It can be used for helping to handle frequently asked questions by detecting keywords in Facebook Messenger, for enabling users to subscribe to the chatbot and receive updates, and notifying users by sending out messages. However,

the free version only offers 1000 messages per month, which could become a constraint for many companies. (It's Alive Facebook Chatbot, n.d.)

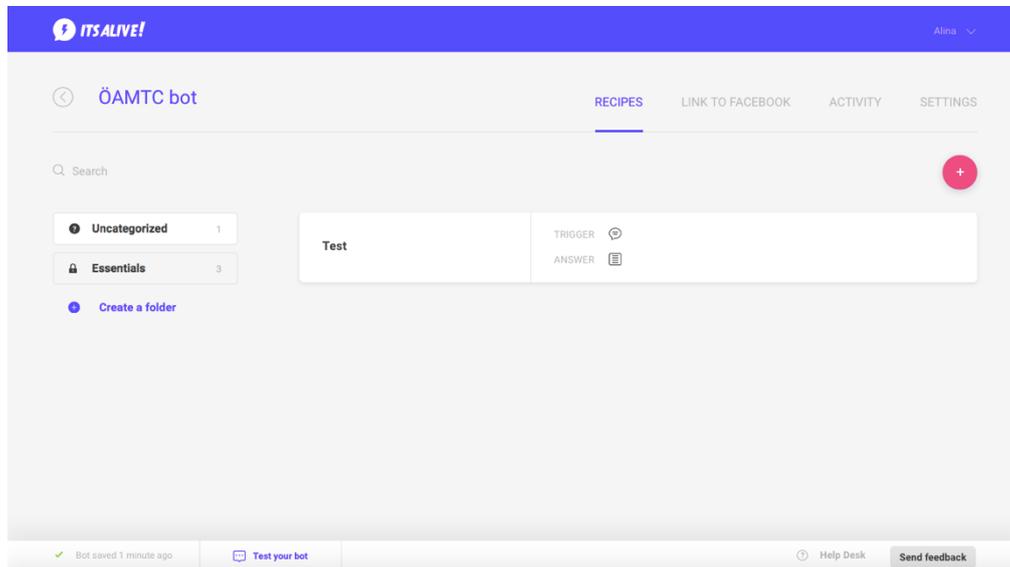


Figure 12. Screenshot of the menu of Itsalive

The ItsAlive chatbot will consist of such-called recipes, which are composed of triggers, the condition that will trigger the content, and answers, the content which the chatbot will send to the users. The creator can choose whether he wants to use button answers only or allow messages as well. Creating the persistent menu makes it easier for users to be redirected to other recipes or external websites.

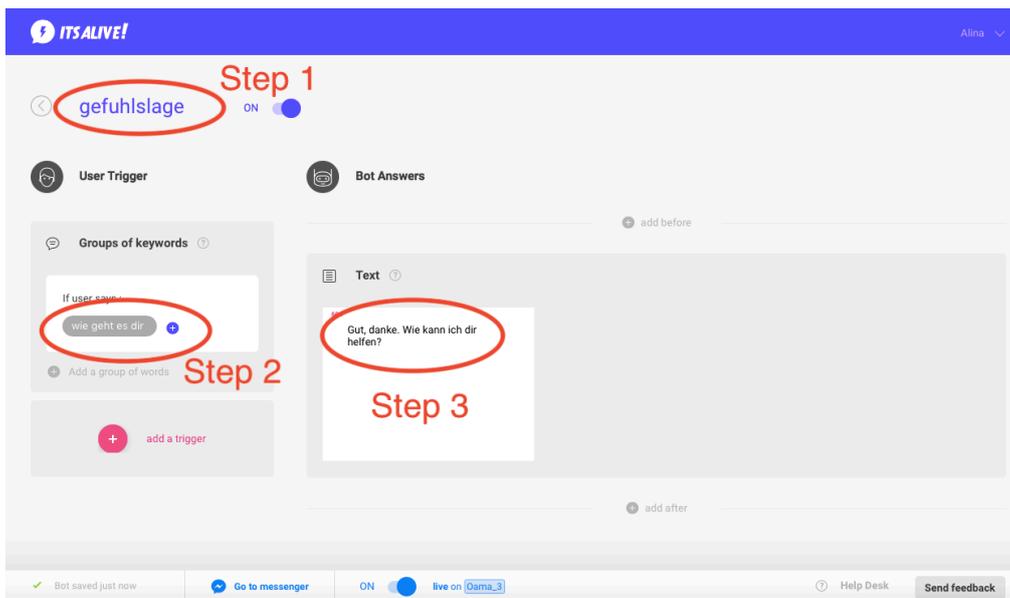


Figure 13. Steps to associate input with output for ItsAlive

Figure 13 depicts the steps required to create a recipe and associate input with output on Chatfuel.

Step 1. A recipe has to be created.

Step 2. Phrases, sentences or sets of keywords a user could put into the conversation can be added. Thereby, ItsAlive offers the possibility to make use of keyword-matching, ensuring that the input provision does not have to be exact and providing more flexibility to interpret text.

Step 3. An output has to be added.

6.4 Onlim

Different to the above-mentioned self-service chatbot applications, there are many channels, especially ones consisting of mainly complex enquiries, which require the acquisition of customised chatbots offered by companies like Onlim. In contrast to self-set-up chatbots, the majority of these chatbot applications is based on a monthly or yearly fee, which again, would mean higher costs. Quite typically, there also exist

free versions of these chatbots, which only offer limited resources and do not maximise utility for the customer in the long run. However, such chatbots offer the big advantage that they start a rule-based conversation, ensuring that the chatbot will memorise the input and learn from it, i.e. the application of NLP. Furthermore, these chatbots are generally more technically advanced and therefore offer more dynamic conversations, which means that they will be less likely to provide an unsatisfying or incorrect answer to the user. (Chatbots and Social Media, n.d.)

As marketing technology evolves, companies like Onlim will ensure that content marketing is brought to a higher level, providing different types of searching and with that, a new set of challenges. Onlim's offers include the development of customised chatbots in order to be able to enter into a more personalised and automated way of customer communication. (Chatbots and Social Media, n.d.)

To do so, three steps seem important:

The first step is to analyse. This includes developing the chatbot's main requirements and to define the details of the project. This is followed by the implementation phase, which covers the application of the chatbot framework and the static dialogues, followed by the development of dynamic rule-based reasoning. Furthermore, once implemented, ongoing testing procedures will ensure the appropriateness and functionality of the chatbot. The last step is the operating part. This phase includes hosting the chatbot and ensuring support. Onlim's customers will have the possibility to use the provided backend interface in order to change and adjust the content of the chatbot. (Chatbots and Social Media, n.d.)

Therefore, one can say that Onlim optimises the task of social media and content marketing for all kinds of businesses through the use of only one platform. According to their website, the simple interface ensures high usability for everyone. Currently, Onlim's products can be published on Facebook, Twitter, LinkedIn, YouTube, Xing, Flickr and Slack. (Onlim Company and Team, n.d.)

Onlim offers three different pricing plans, which differ in offers available. The "professional" plan is for free but includes only the editorial calendar, social networks, content sources and statistics. The "business" plan costs 49€ monthly and, in addition

to the features from the free version, offers a multi user account. The most expensive plan is the “enterprise” plan which is the only pricing plan including content distribution to chatbots and artificial assistants and a customised chatbot. (Pricing, n.d.)

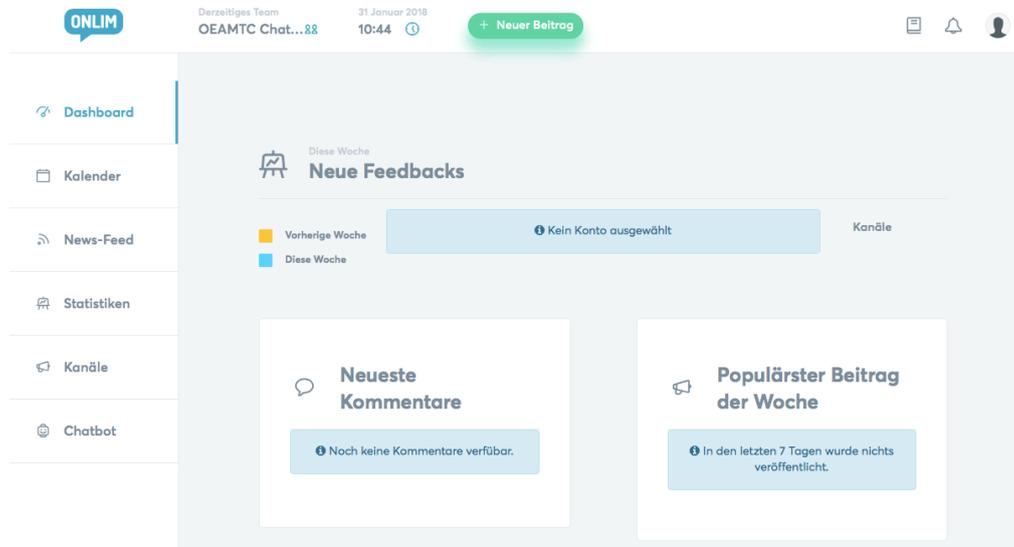


Figure 14. The dashboard of Onlim

To use Onlim, one would need access. Once logged in, the homepage looks like an appealing interface where the creator has the possibility to look at the calendar, the news feed, the statistics and the channels all at once. These features can be clicked onto on the left side of the page. There is also the possibility to watch some tutorials in case help is needed and to create and manage the chatbot.

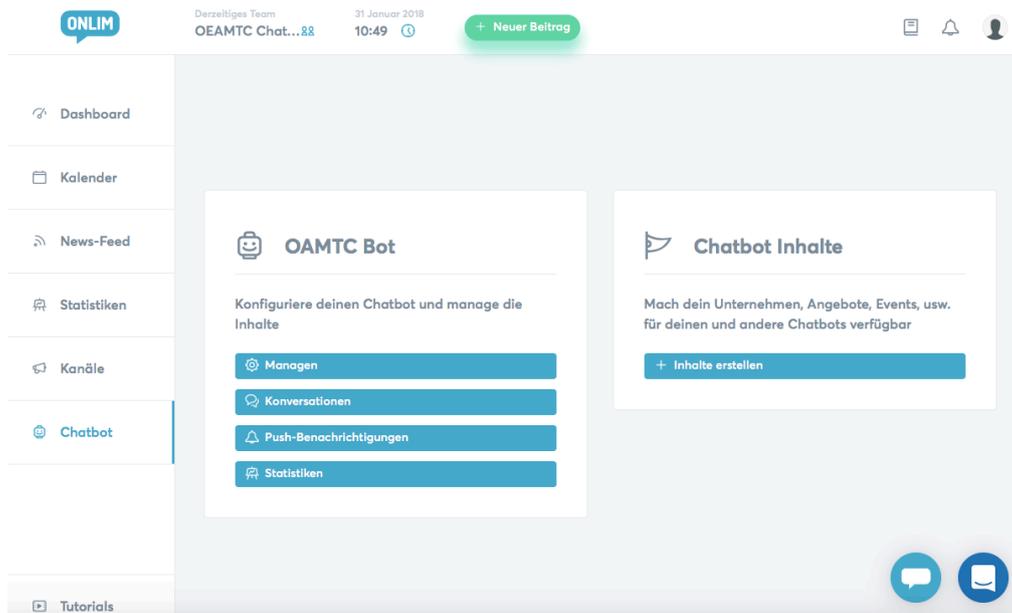


Figure 15. The chatbot interface

Managing a chatbot is easy with Onlim, as it even allows creators to add a profile picture or to change the service hours to ensure a pleasant procedure for the user. Each chatbot is provided with some common small talk intents from Onlim beforehand, which makes it easier for any company to incorporate a chatbot because this relates to less work needed to be invested. The company can see all conversations at any time and interrupt the chatbot in order to continue the conversation with a human.

The actual provision of intents is to be done on Dialogflow, which an additional account is necessary for. Further information on the easiness-to-work with Dialogflow to be followed in the analysis section.

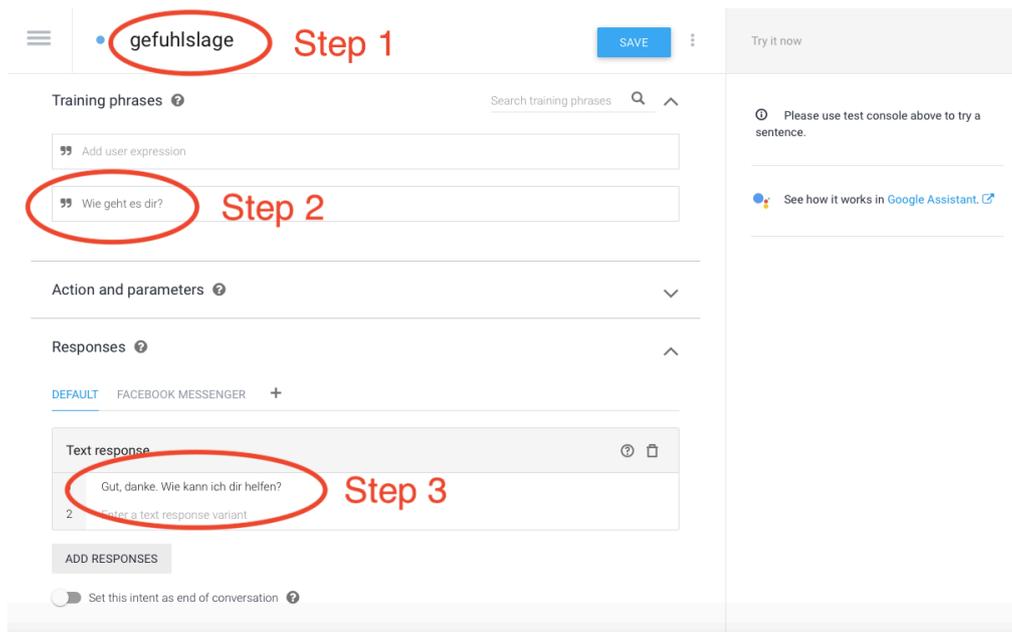


Figure 16. Steps to associate input with output for Onlim

Figure 16 depicts the steps required to create an intent and associate input with output using Dialogflow for Onlim.

Step 1. An intent has to be created.

Step 2. Phrases, sentences or sets of keywords, so-called training phrases, can be added. Thereby, Onlim offers the possibility to enter more keywords for the same set of outputs, increasing flexibility to interpret text. Furthermore, Onlim's chatbot is the only one offering rule-based matching and ensuring a dynamic and ever-learning engine behind the conversation. (Chatbots and Social Media, n.d.)

Step 3. One or more output possibilities can be created.

6.5 Summary

The table presented below provides a summary of the major differences between the considered chatbot platforms.

	Chatfuel	Botsociety	ItsAlive	Onlim
Is simple to use?	Yes	No	Yes	Not at the beginning
Is the interface appealing?	Yes	No	No	Yes
Can be applied on?	Facebook Messenger, Telegram	Facebook Messenger, Slack, Google Home	Facebook Messenger	Facebook Messenger, Website
Is it for free?	Yes	Yes	Yes	No
Needs to be connected to a Facebook page?	No	Yes	No	No
Are tutorials available?	Yes	No	No	Yes
Is setting up AI possible?	Yes	No	Yes	Yes
Are analytical tools available?	Yes	No	No	Yes
Are other marketing offers or tools available?	Yes	No	Yes	Yes

Is the chatbot flexible to interpret input text?	Yes, keyword detection	No, only exact match	Yes, keyword detection	Yes, NLP-based
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7 Analysis

7.1 Structure

In order to analyse the four chatbots individual Facebook pages were created for each respective chatbot. In the interest of not damaging or changing the image of the ÖAMTC, the chosen names of the Facebook pages do not imply any relation with the ÖAMTC. Similarly, no specific product names will be used in the chatbots and no links will be forwarding anyone to the ÖAMTC website. Any product names were substituted with the initials and mail addresses with example letters. Typically, every answer would be linked to a website, however, no websites were included in the outputs provided in this research. This is to ensure that the testing of the chatbots is touristic-related, yet not to establish a link between the chatbots and the ÖAMTC.

The four Facebook pages do not differ in terms of category of business, but only in terms of name and font colour of the picture. The created page names are as follows:

- (1) Chatfuel: Oama_3277 (blue font)
- (2) Botsociety: Oama_3287 (green font)
- (3) ItsAlive: Oama_3297 (red font)
- (4) Onlim: Oama_4277 (pink font)

In order to create a fair basis, all four chatbot applications were provided with the same input-output-structure, as enclosed in the Appendix. However, this list is very limited and creating a more detailed structure will take time as it is not yet known which questions will be asked to the chatbot. It was the aim to create as many quick answers as possible in order to minimise errors and wrong answers and, in turn, unsatisfied customers. As the ÖAMTC is an Austrian organisation, its working language is German and therefore, the chatbots were set up in German. All chatbots received the same five questions, as follows:

- (1) Wo finde ich Informationen zu Estland? Information Estland, Estland Information, Informationen Estland, Estland Informationen
Where do I find information about Estonia?

- (2) Wo finde ich Informationen zu London? Information London, London Information, Informationen London, London Informationen
Where do I find information about London?
- (3) Wo finde ich Informationen zur Sicherheitslage in Ägypten? Sicherheitslage Ägypten, Ägypten Sicherheitslage
Where do I find information about security in Egypt?
- (4) Wie teuer ist die Maut in Slowenien? Maut Slowenien, Slowenien Maut
How much does toll cost in Slovenia?
- (5) Wie erreiche ich das Konsulat in Spanien? Konsulat Spanien, Spanien Konsulat
How do I reach the consulate in Spain?

Furthermore, the chatbots' quick replies were followed in order to find information about the following five categories:

- (1) Passagierrechte beim Konkurs einer Airline
Passenger rights in case of bankruptcy of an airline
- (2) Carnet de Passages
- (3) Versicherungen im Ausland
Insurances abroad
- (4) Tempolimits in Europa
Speed limits in Europe
- (5) Vollmacht für alleinreisende Kinder
Authorization for children travelling on their own

Each chatbot application received two welcome messages, which are connected to the phone number in case of urgency and to quick replies. Similarly, the default answer was populated and comprises a phone number. Onlim's chatbot included a small talk intent, however, all others did not because it is simply not the aim of this research, but it could be taken into consideration for further usage and implementation.

Besides setting up quick replies, the chatbots should be able to understand the expression of one’s thanks, greetings, wellbeing, existence and questions about categories of the country database.

7.2 Chatbot platforms and their capabilities

As discussed in the literature review, chatbots have to fulfil some capabilities in order to be functional for a company. In addition to the metrics and functionalities proposed above, some personal evaluation was done to be able to differ between the four chatbot applications.

To notify, all evaluation below was done based on the versions available to the author of this research. Therefore, using premium chatbots and paying for them could have resulted in a different outcome of the analysis.

7.2.1 Functionalities and metrics

Capabilities	a) Chatfuel	b) Botsociety	c) ItsAlive	d) Onlim
Total percentage number of matches found*	25% Quick replies: 100%	This could not be evaluated.	15,79% Quick replies: 80%	100% Quick replies: 100%
Scheduling	Possible	Not possible	Not possible	Possible
Summaries and statistical data	Not available	Not available	Not available	Available

Analysis of unstructured data	Not available	Not available	Not available	Available
Quick answers	Available	Available	Available	Available to add options to the menu
Only buttons, or buttons and open replies	Available	Not available	Available	Not available

*The chatbots have been set up with the intent structure as provided in Appendix 3. The calculations for percentage number of matches found is based on the accuracy of the provision of results by the chatbots as can be found in Appendix 4.

7.2.2 Personal evaluation

Admin interface:

a) Chatfuel

Chatfuel offers a highly appealing interface and its features are easy to detect. It is possible to start setting up a chatbot and only connect it to a Facebook page at a later point of time, i.e. the chatbot will only be ready once it is completely finished. Furthermore, Chatfuel provides the possibility to send out messages to the user certain hours or days after the conversation has ended in order to be able to promote customer loyalty. However, some features are only available after upgrading, like changing the language of the small talk provided. Additionally, the quick answer buttons have a limited word count, likely making it difficult to deliver a certain message.

b) Botsociety

The admin interface of Botsociety is functional as it displays an iPhone and demonstrates changes of the chatbot immediately on it. This way, admins can instantly view how adjustments affect the user's perspective. However, this interface makes it quite difficult to find certain features, such as connecting the chatbot to a Facebook page. Unfortunately, there only exists the possibility to share the chatbot mock-up and the preview as a video on Facebook. Obviously, this will limit the extent to which Botsociety's chatbot can be taken into consideration for this research and analysis.

Furthermore, there was no possibility to enter a default message found, which limits the convenience for the user in case of error. Although it is possible to enter quick replies, they are limited to seven answers only and no links can be added. Botsociety does not offer an Artificial Intelligence function, i.e. not more than one input can be related to a certain output and the user's input has to be the exact same as defined by the admin. Lastly, the website is not responsive and only works smoothly with large screens.

c) ItsAlive

The first inconvenience issue will encounter the admin when first logging into ItsAlive as there is no social login available and one has to register from scratch. The free option is limited to one chatbot only with a maximum of 1000 messages a month, has an ItsAlive watermark and does not receive any support from the company.

The admin interface is not responsive and works only on relatively large screens. It is not possible to add more than one welcome message and it can be associated with only six quick replies. Adding more than one answer to quick replies is not possible and instead, cards have to be used. These cards have a very limited word count and only ten cards can be displayed on Facebook at once. Therefore, not everything is visible at once and there is a potential to lose customers looking for a specific question as it takes time to scroll through the cards. When entering a group of keywords to set up AI, one always has to click on the plus and it is not possible to save a keyword with simply pressing enter, consuming more time.

d) Onlim

Onlim’s interface is easy to work with. The features are kept simple but efficient and are quick to be understood. However, the intents are not provided into Onlim’s interface, but into Dialogflow, which looks very different to Onlim’s website. It takes time to find out everything about the various features offered on Dialogflow, nonetheless, it is well-structured and makes everything you wish possible. Working with Dialogflow could be an obstacle for someone who has never worked with setting up chatbots before as some of the elements can be unclear at the beginning.

The intents themselves are created on Dialogflow and have to be unlocked by Onlim. After doing so, the admin can enter the different answers using Onlim’s interface. One can choose between a text message, a picture, a quick answer, cards or a button. Thereby, it is also possible to enter a link or a phone number in case direct contact is needed.

An advantage of Onlim is that one can set up the chatbot without having to integrate it onto a Facebook page immediately. This makes optimising the chatbot easier and will reduce the percentage number of errors. Furthermore, Dialogflow lets admins see all conversations at once and it is possible to directly link an intent to a certain user input and thereby, train the chatbot based on real conversations.

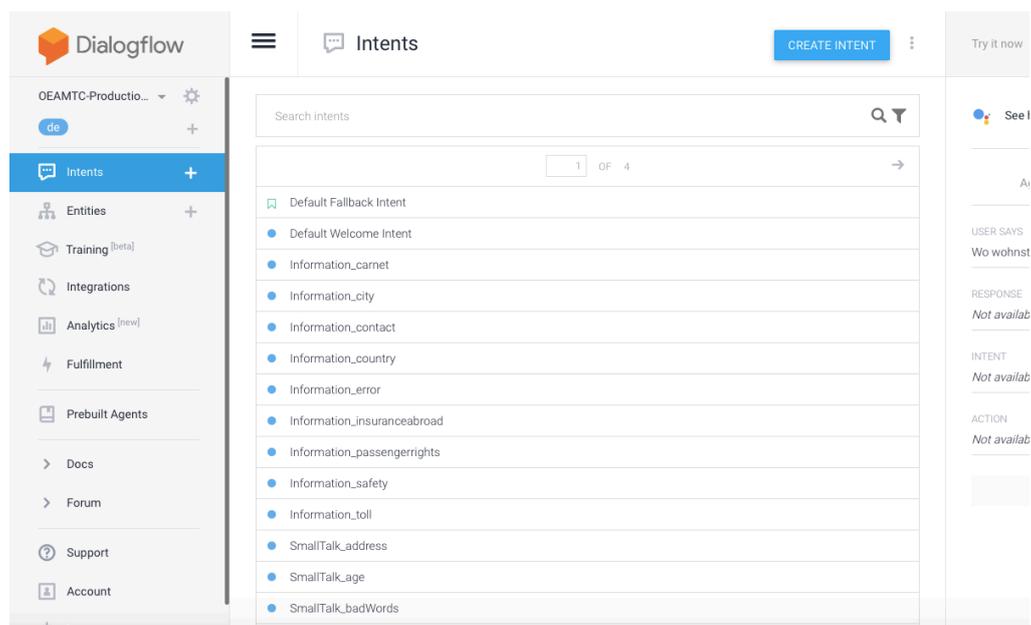


Figure 17. Dialogflow used for Onlim

One issue which the author was encountered with is that it is only possible to associate the persistent menu with 3 menu entries. This is one issue which could be solved by Onlim introducing more menu options. However, it does not mean that the chatbot is not useful since admins could simply redefine the structure of the chatbot and set up less categories, possibly introducing more submenus. Alternatively, the intents used for the menus could be provided with an answer which consists of cards, so that all possible categories are displayed.

Although it took some time to become familiar with Dialogflow, it is to say that amongst all four chatbot applications, Onlim's chatbot is the admin-friendliest one, provided that the admin has enough time to get to know the different components of Dialogflow.

Graphical user interface:

a) Chatfuel

The communication with Chatfuel is simple. At any time, the user has the choice to start all over again with a small button in the corner. This is especially useful if a user has more than one question or wants to start again because of a wrong output of the chatbot. The chatbot has been able to reply correctly to one fourth of all conversations which is a bad result concerning high quality service provision, but is the best result of the self-set-up chatbots. Although nothing was changed, Chatfuel's chatbot had problems understanding the same intent provided on different days, which obviously limits user satisfaction. Furthermore, after choosing a quick reply, it was highly irritating that all possible replies opened after each other as this takes time and makes it inconvenient for the user to read through every reply.

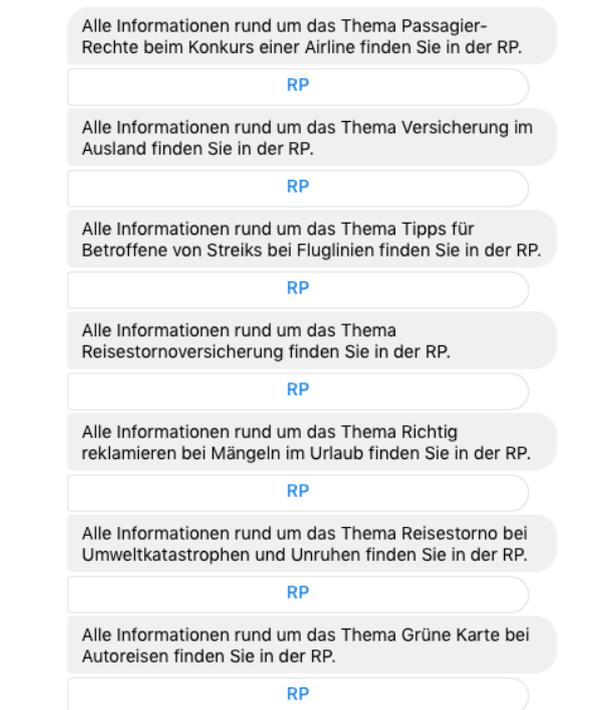


Figure 18. Screenshot of Chatfuel's chatbot

c) ItsAlive

ItsAlive was provided with the same intents as Chatfuel and scored low concerning the provision of correct results. This is also due to the reason that this chatbot provided the same output for all user inputs, although it was defined differently. There is no possibility to restart the chat, so it becomes troublesome when a user would like to ask the chatbot for advice again. Furthermore, the chatbot showed a second Welcome message, which was not put into the application.

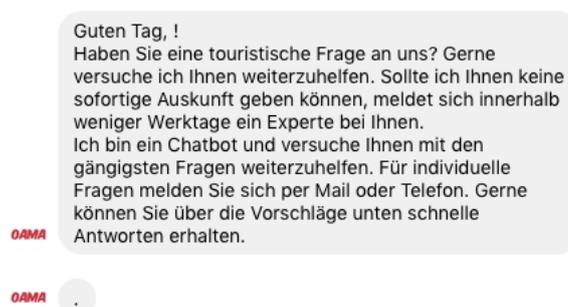


Figure 19. Welcome message of the ItsAlive chatbot

d) Onlim

Onlim provided the correct results for each input and has therefore, scored highest out of all four chatbot platforms. At any time, the user can restart the chat when pressing the persistent menu on the left, which makes the experience convenient. However, Onlim’s chatbot would certainly – like the other chatbots – score lower results when used with complex enquiries and it is therefore only advisable to be used with standardisable enquiries.

As mentioned above, the persistent menu can only be associated with three categories and the evaluation of the answers of the quick replies could become less reliable if not changed and arranged accordingly. This could increase the percentage number of incorrect results in the long run since quick replies are said to increase the provision of accurate results and can structure a conversation.

To summarize, the table below provides a personal ranking with scores from 1-4 (1 represents the best, 4 the lowest score) for both, the chatbots’ admin interfaces and graphical user interfaces.

	a) Chatfuel	b) Botsociety	c) ItsAlive	d) Onlim
Admin interface	2	3	4	1
Graphical user interface	3	4 (could not be used for evaluation)	2	1

8 Discussion

The chatbots used in this analysis have been evaluated from many perspectives and therefore, the decision towards or against a certain application is always a matter of individuality. The author has been influenced not only by the results of the analysis, but also by the interviews conducted at the ÖAMTC and thereby the opinions of the employees.

Generally, it is to say that three out of the four chatbots used were far below the desired metrics results, however, some features made certain chatbots stand out. Chatbots which allow to disable the user's input and only support the communication via buttons can reduce the dissatisfaction amongst users because they will always be delivered with the correct result. However, it is important to ensure that the user has the possibility to contact the organisation via mail or phone call in case he has a specific question not listed in the buttons available.

Furthermore, some features have a limited work count only which can make it problematic for the organisation to deliver an appropriate message. Therefore, applications which offer no limited word count could be preferred by certain companies. Additionally, the user's experience can be disrupted due to the numerous answers which appear after choosing a quick reply button. In contrast, It's alive offers cards, where the user has the possibility to simply swipe and find all messages next to each other, rather than listed underneath. However, Facebook allows a maximum of ten cards per quick reply, which suggests that the analysis of the chosen cards should be done precisely.

Botsociety has failed to deliver the results needed and was not evaluated. Not only was it difficult to set up the chatbot itself, but the author was also unable to connect it to a Facebook page and therefore, there was no decent analysis. When a chatbot application is used in a real-life setting, the admin would certainly have gotten desperate when trying to find a connection to Facebook after investing a lot of time into properly setting up the chatbot. Accordingly, it is the author's advice not to use Botsociety for creating a chatbot.

Chatfuel and ItsAlive received similar scores in the metrics, however, Chatfuel seemed to be better off by a small percentage. Chatfuel's chatbot was easy to set up

and there were no problems encountered. Its admin interface is more appealing than ItsAlive's, nonetheless, the chatbot of ItsAlive is more appealing due to the availability of cards. Therefore, companies with short and only few answer possibilities are advised to use ItsAlive, all others should take advantage of using Chatfuel.

Although creating the chatbot was simple for both, Chatfuel and ItsAlive, it is still to be considered that creating a large pool of Artificial Intelligence will take up a lot of time and testing. Only after testing a technology, as advised by Dworak, one will know exactly which enquiries will be sent to a chatbot. Creating chatbots from scratch can become highly time-consuming as the admin has to ensure to cover all possible inputs and match them with correct and satisfying outputs, which, in turn, will cost a lot of labour resources.

Inexplicably, both, Chatfuel and ItsAlive, had issues with matching the input to the correct output. On the one side, Chatfuel matched a certain input with the correct output on one day and the day after it was unable to match the same input. Furthermore, it is highly reliant on the correct use of capital and small initial letters. On the other side, ItsAlive provided the same and therefore mostly incorrect output for each individual input, which minimises the accurate provision of satisfying answers.

In a department where one can ask the same question concerning many different categories, setting up a chatbot can become a difficult task. At the ÖAMTC, information about all countries of the world and many European cities is provided. Setting up an input-output-structure will become challenging because it is not possible to simply provide a list of all countries and match them to each individual input. The admin has to set up all possible questions for each available country individually. Again, this will increase the time invested and thereby labour costs.

The task described above is not needed when using a chatbot like Onlim as the company typically installs the chatbot for the customer. Onlim's chatbot makes use of Artificial Intelligence and is not as bound to the specific wording of the input as the other chatbots. Different to the other applications, Onlim's chatbot is not available as a free version and will therefore result in higher fixed costs for the

organisation, however, it carries fewer labour costs as no set-up has to be done by the customer itself. Onlim scored the best results concerning the metrics and is the most efficient application out of the ones chosen for this research as no major problems, neither concerning the admin interface nor the graphical user interface, were encountered. Another advantage of using Onlim’s chatbot compared to the other ones is that an organisation will receive support from the team behind Onlim at any possible time and feedback and statistics from the interface.

8.1 List of enquiries

It is the aim of the ÖAMTC to find out which enquiries could be standardised and handled by a chatbot, which ones can be answered by an employee of the call centres and which ones require expertise. The table below should serve as a basis for fulfilling this desire. It is to acknowledge that some categories could be standardised to some degree, however, the enquiry could be detailed and could need to be tailored individually to the customer.

Enquiry	Chatbot	Call centres	Expert
Information about cities	X		
Information about countries	X		
Rented car	X		
Contact information	X		
Toll and congestion charge	X	X	
Emergency abroad	X	X	
Traffic regulations	X	X	
Legal information	X	X	
Passport	X	X	

Mandatory requirements for vehicles and motor bikes		X	
Personal documents		X	
Vehicle documents		X	
Drivers licences		X	
Traffic regulations		X	
Certificate of authority for children travelling alone		X	
Other enquiries, individually tailored to the customer's need			X

9 Conclusion

The central aim of this thesis was to find out whether chatbots are useful for the service industry and why an organisation should or should not use chatbots. For this purpose, a literature review and interviews were conducted and the findings were translated to the analysis afterwards. This examination enabled the author to gain knowledge about the usefulness and appropriateness of chatbot applications nowadays and to provide a recommendation for organisations operating in the service industry. More precisely, the findings of the second part are based upon firstly identifying the first and central research question concerning the practicality of chatbots. For this reason, it is necessary to address the findings corresponding to the first research question and, subsequently, provide recommendations.

Although chatbots have already been in use for some decades, it could be said that most of them still face some major problems concerning day-to-day business. One issue includes that users are always heterogeneous which implies that they are individuals and need answers to be personalised. This statement is especially true for service industries, where high quality consistency is crucial. (Pinhanez, 2011) The chatbots used in this research have been set up for solving the simplest queries and forward customers which have a specific enquiry, and thereby minimising labour resources in the long run. However, in such a high-quality service organisation like the ÖAMTC it is likely that the time needed to invest into correcting wrong answers provided by the chatbot and explaining to customers why their enquiry was interpreted inaccurately exceeds the time invested into answering all enquiries by themselves.

Chatbots are usually programmed by developers and any input provided into the conversation has to adhere to an expected path in order for the chatbot to be able to provide the correct answer. This, in turn, could mean that the user faces a more complicated conversation, trying to find the correct result. (Fakhrudin, 2017) As mentioned above, using chatbots which are not perfectly implemented and tested could result in dissatisfaction amongst users and employees having to apologise and correct the inaccurate results. Thapa (2016) mentions that chatbots are typically unable to understand forms of sarcasm and irony, which corresponds to the fact that Dworak believes dialects will not be understood well.

Despite the fact that it can be assumed that applying chatbots to service industries is difficult because of the high level of quality and individuality, using chatbots for simple tasks can reduce the overall time invested and thereby, reduce costs for the organisation.

However, besides the downsides of chatbots, they also carry along many advantages out of which the four main ones include added convenience, saved costs, the opportunity to maximise customer engagement and outreach and minimise customer service man hours. (Jain, 2016) Although chatbots are still limited, they will surely improve efficiency day by day and the advantages will come to show and should not be neglected because those can affect the business's performance drastically.

Many aspects have been included in the research of this thesis. Therefore, providing recommendations based on an examination is always highly individual, depending on an author's tendency. However, some general recommendations can be made and are listed below.

To start with, chatbots will not be able to solve all queries, especially in service industries, however, routine queries can be standardised and should deliver a high level of performance. (Guzman & Pathania, 2016) Although the chatbot platforms used here have not been able to provide the corresponding output for the specific input, with enough training and time invested, they should be able to. Guzman & Pathania (2016) suggest that at least five weeks of training are necessary, whereas Dworak put forward that six months are required at the ÖAMTC.

As mentioned by Tauer, the demand of enquiries varies depending on the season, which was also predicted by Pinhanez (2011). However, when monitoring enquiries over the long run, one can identify peaks and predict demand and labour resources needed depending on that. It is highly advisable to make sure that the pre-set goals are achieved and otherwise to abandon the chatbot.

Furthermore, chatbots have to be well designed in order to be accepted by the users, which highlights the importance of usability testing to assure that a chatbot is

useful. (Preece, 1994) The user should always be the first priority (Preece, 1994) because an organisation can take away as many advantages as possible, but if the user is unwilling to interact with the chatbot, there is no utility. Dworak mentions that it is crucial to be able to accept that a tested application does not work and not to be afraid to decide against it.

Chatbots have only been used commercially for the last few years. Consequently, there have already been issues with social engineering attacks, which, in turn, makes it highly important for a company incorporating a chatbot to assure that the chatbot is highly secure. Some user's willingness could be held back when the user is afraid of data security. (Fakhrudin, 2017)

The evaluation of the four chatbot platforms used in this analysis has proven the majority of findings from the literature review.

On the one hand, all three self-service chatbot platforms have scored insufficient results as compared to the metrics. Although some of the chatbots' set-up was easy, each individual platform had – partly even significant – weaknesses. These chatbots have no fixed costs themselves, however, the author believes incorporating a chatbot that is not capable of understanding users' phrases – even ones that correspond exactly to the intents provided – will result in more time needed to correct the results of the chatbot. This, in turn, could lead to more man working hours and higher variable costs, also decreasing loyalty and satisfaction amongst customers.

On the other hand, Onlim's chatbot satisfied with a high number of enquiries solved during this research. Therefore, a chatbot like Onlim's could be used for simple enquiries, requiring no individual tailoring to the individual user. Whether a service offered by a company could be standardised is to be determined by the percentage number of complex enquiries. The higher the number of complex enquiries, the lower the results achieved by a chatbot will be.

Coming back to the problems identified during the interviews, some could possibly be solved.

Naturally, the RMS department at the ÖAMTC could receive low scores concerning the provision of correct results by chatbots if introducing a chatbot for all enquiries. However, as an example, there could be a decision to introduce a chatbot for only the route planner, the country database or a different, more simple-to-standardise department of the ÖAMTC. Tauer's apprehension could turn into reality as the RMS department receives few enquiries compared to other departments, which could, in turn, decrease the overall time saving when implementing a chatbot.

The problem that too few enquiries would be understood by the chatbot, as mentioned by Dworak, could be solved by only partially introducing a chatbot or by training the chatbot extensively. As an example, Onlim's chatbot can be trained based upon earlier conversations and user inputs, using Dialogflow. Additionally, enough time should be invested into setting up the intents, which will pay off in the long run.

Dworak commented that she believed the chatbot providers tested at the ÖAMTC scored insufficient results because chatbots are not as advanced in German as they are in English. This argument could be contradicted, since Onlim's chatbot provided sufficient results and was used in German only. In contrast, the problem of the misunderstanding concerning Austrian dialects is still an issue. Advanced chatbots are beginning to offer a possibility to enter synonyms for specific words, which could also enhance the experience of users writing a conversation in a different dialect. It would also be important to know whether the percentage number of users communicating in a dialect is high as the author expects only few users to write a formal enquiry in an informal way, i.e. in a dialect.

As proposed by Dworak, the ÖAMTC has enough employees to handle all enquiries on a timely basis. However, introducing a chatbot at this organisation is not unnecessary since the chatbot is, in contrast to the majority of staff, always available and will ensure high consumer satisfaction and loyalty when used in an appropriate setting and set up and tested well.

Taking the findings from this research in mind, the author has some personal recommendations to give.

Firstly, it is to acknowledge that companies operating in the service industry should find the individual degree to which their enquiries are standardisable and base their decision towards or against a chatbot on this result. Whether a chatbot is useful for a certain company or department is always a subjective matter and cannot be generalised easily, not even for similar departments, because typically, the enquiries received vary heavily.

Secondly, no matter which chatbot is used for whichever domain, a chatbot will require a proper set-up and long testing phase. Any organisation seeking to incorporate a chatbot should have in mind that the time invested into preparing the chatbot should never exceed the time saved by implementing a chatbot. For ensuring that the project of setting up a chatbot works as expected, a detailed plan is required. This plan should not only include the expected time spent to set up the chatbot and saved by using the chatbot in day-to-day business, but also the required cash saved in the long run. If the configuration does not work as planned or if the expectations are not met, the company should consider relinquishing or adapting the plan.

Through the careful study of the findings of this research, the author has come to the conclusion that, although some scored better than others, all three self-service chatbot applications are not ready to be used in a professional setting yet. Those chatbots could be used for very simple enquiries on Facebook, however, some did not understand the enquiry although it was provided to the chat in the exact same way as in the intents. However, Onlim has stood out with its Metrics score and has convinced the author to recommend using Onlim's chatbot when looking for a chatbot to be used in day-to-day life. Onlim does not only offer an efficient interface and an operative chatbot, but also support whenever a company is in need of help or assistance.

Lastly, the analysis of the chatbot applications and the interviews has led the author to recommend that the RMS department receives too complex and individual enquiries in order to profit from incorporating a chatbot. However, it could be advisable to use a chatbot in case a customer does not find the matter he is looking for or for giving recommendations or reporting errors in the country database and the route planner. A pop-up chatbot could be used when ensuring that the chatbot mentions what it is able to solve and help with and providing a phone number or email address in case a different question is to be sent. This would help in reducing the total number of enquiries received by email.

Additionally, it could be advised to incorporate a chatbot in other departments at the ÖAMTC. As mentioned by Dworak, the online form to conclude a membership is used frequently, but many users back out at a certain point. If the ÖAMTC would be able to find out at which exact point of data input those people stop putting in their details, a chatbot could be used to pop-up and to provide the help and assistance that is needed. Nonetheless, this represents only of the many uses a chatbot could have within the ÖAMTC.

10 Future work and limitations

Although all research has been done in a careful manner, some limitations must be taken into consideration before generalising any results.

Firstly, the chatbots were not tested with real users and a different evaluation could therefore lead to a different result. Only analysing a chatbot from the company's perspective and deciding on the best one might cause a different result as to when the chatbots are tested amongst potential or real customers.

Furthermore, the chatbots used were only applied to Facebook, a social media platform, and not onto a website. This could naturally lead to fewer people using the chatbot and to different results as compared to chatbots used on websites.

Since the results are found specifically for the touristic enquiry process at the ÖAMTC, an Austrian company, outcomes of other departments, other processes or even other companies in a different location could vary strongly. Therefore, the generalisation of those results is limited.

The travel and mobility department at the ÖAMTC receives a lot enquiries of high complexity and individual research. This means that the difficulty of enquiries of a respective department drastically shape the decision towards or against a certain chatbot application or technological development generally. These findings may have been different in another department at the ÖAMTC which receives easily to standardise enquiries.

The decision and evaluation was done with respect to the interviews conducted with employees and the head of department beforehand. This implies that some parts could have been influenced by expressions and statements made during those interviews.

Additionally, three out of four chatbot platforms used are set up by companies themselves and free versions, which naturally leads to a different outcome than when using only programmed and high-professional chatbot applications. One could argue that comparing a free version to a professional and paid chatbot is not necessarily a fair procedure.

Furthermore, it is to acknowledge that all questions posed to the chatbots were in standard German and no dialects were used in this analysis. Therefore, analysing the chatbots in a real-life setting will lead to different results and may shift the decision towards a different chatbot application.

Given the study limitations presented above, generalisation of any results from this thesis have to be done carefully. Further research most likely needs to be done in this field in order to produce more robust and complete results.

It would make up an appropriate future work to properly test the chatbots amongst possible users and find out which chatbot works the best in a real-world simulation. Another possibility is to try and find similar results and the obstacles for employees concerning time and resources investment for a different department or a similar department in a different company.

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Appendices

Appendix 1

This interview was held with Mrs Mag. Erika Dworak on January 23rd, 2018.

Interviewer: On which domain did you plan on introducing a chat service? Do you plan on further expanding the domain at a later point of time?

Dworak: We very much like to work with pilot projects at the ÖAMTC, which means we try something on a manageable field and it will get expanded to a larger domain in case it works well. The current consideration is to offer a chat service in two areas. Firstly, we would like to try it with the country database because we want to give customers the possibility to communicate and work with us via chat and not only via email and telephone. Secondly, the ÖAMTC offers a join form for the membership and the assistance booklet on its website and when using Google Analytics, we notice that some people back off at a certain point. We believe that if they have the possibility to quickly ask something that is unclear, especially for those who do not want to call someone or write an email, then a chat service would be helpful.

Interviewer: Why did you think about introducing a chat service for the RMS department?

Dworak: I just realise that more and more organisations introduce a chat service and it simply corresponds with the zeitgeist, that people expect to receive a quick answer even if offices are closed and emails will not be answered before the next day. I personally experienced this very positively once with the company Jack Wolfskin. I always do my bills in the evenings and one day, a question regarding one popped up and I was able to solve my question within 5 minutes although it was nearly 10 pm. This is a very positive experience for me as a customer and I believe the ÖAMTC could offer this attractive service as well. However, we are currently just at the beginning. We have created the ideas we would like to implement and have forwarded it to the corresponding departmental heads. The whole chat service should operate via a telephone system which we just acquired and we are currently in the conception phase.

Interviewer: What are your motives behind introducing a chat service?

Dworak: I am very thankful to be in a wonderful position where I am welcome to bring in new ideas actively and I addressed the topic of chatbots and a chat service at the “Landesverein” touristic meeting, where we report our colleagues and introduce them to our plans for the upcoming 12 months. The result from this meeting was that we were asked to try it out as a pilot project. However, it is not advisable that our colleagues face a larger amount of work and this is why we would like to try it only on a small field. The difference for us concerning a chatbot is that we have clearly decided that principally the human being has to be at the end of the line because firstly, we have to collect empirical values and secondly, we do not yet know which exact questions will pop up concerning the country database. We might be able to consider implementing a chatbot of IBM Watson or other big players on the market at a later point of time, which we have already started to try. However, the results were insufficient as the chatbot was not able to understand any dialects and this is important for the ÖAMTC as its responsibility is for all over Austria. We have four call centres in Vienna, Innsbruck, Linz and Graz and the ÖAMTC would be able to manage a chat service personnel-wise.

Interviewer: You decided for a chat service and against a chatbot. What would have been reasons where you would have decided to abandon a chat service as well? Which goals have you set?

Dworak: The plan is to have the concept of how the new telephone system will work by the end of February 2018 and we would then install the chat service at the RMS department for six months. We always count how many contacts there are per week and how much time is invested and by this, I can determine my personnel resources needed – it always works like that. After these six months, the steering committee, a board of department heads, will receive information and reports about the results and discussions will follow. Decisions about the future of pilot projects are made together. I believe it is important to try new things but it is just as important to have the courage to cut off at a certain point if something does not work out as planned. There is nothing worse than to constantly take along projects that only cost resources but are not successful. And I define successful that they add value for the members – that is always our approach. Everything that contributes to the satisfaction of

members, either maintenance or acquisition, should be covered with resources. Everything that only costs resources and time should be rationalised.

Interviewer: What do you expect from introducing a chat service?

Dworak: I personally expect a new channel of communication. We noticed something interesting last year when we introduced an assistant for emergency services in our app. Once someone had a breakdown he could communicate via different buttons with us, but the users did not accept this and started using the assistant like a traditional chat. They started writing us messages that they e.g. managed to fix it by themselves, but the system was not prepared for this and did not appear like communication messages in our system. We then drove there and were unable to find the customer and these are experiences where we notice that those services are accepted and that people want to communicate with us in live chats. Especially when one is in an emergency situation he will not be willing to send an email and coming through to our call centres when there is a lot of work to do is difficult at times. Those are the moments where one wants to quickly talk to someone and that is why I am convinced that these chat services will open a new target group.

Interviewer: Do you think chatbots will be accepted by the target group of the ÖAMTC?

Dworak: I believe chatbots will be accepted because the ÖAMTC has the reputation of being a competent contact partner and I believe that people will come up to us with detailed questions. Our partner association, the ADAC, has launched a WhatsApp service called "Frag Julia" and although it was not majorly advertised, it was well accepted amongst members. People started asking questions about traffic jams or asked for help from a lawyer. I believe as we have the reputation to be both, objective and competent, the implementation of this channel will allow us to notice acceptance.

Interviewer: What are your personal thoughts concerning this topic?

Dworak: I think it is about time that we jump on this train. I am afraid we are not quite as progressed concerning some technological changes as other organisations, however, we should start catching up in order to signalise to the outside that we want to be reached via such a communication channel. And I personally believe this is also

the future because use of emails will start to decline and it is difficult for me to come through to the call centres if there is high demand. What I am happy about is that we avoided a telephone voice assistant at the ÖAMTC. I believe our slogan has always been that the human being is in the centre at all times, both, on the customer side and the employee side. The human being is in the centre and two people interact with each other in a dialogue – this is why I personally prefer a chat service over chatbots.

Appendix 2

This interview was held with Mrs Mag. Kristina Tauer on January 30th, 2018.

Tauer: As I said, it can be difficult to answer the questions you sent me at some parts because we do not handle the majority of enquiries, this is done by the counter workers or the Landestouristiker, which would be Susanne Neuwirth and Doris Kunc. They receive a lot of enquiries and the ones we receive are relatively few and it can be difficult to answer your questions, but let's just start and try.

Interviewer: How much time do you invest on answering the enquiries each week?

Tauer: This is totally different each week. It heavily depends on which time of the year it is. There are drastically more during peak season because it simply is the time when there generally are more enquiries at the ÖAMTC than compared to winter. One can say the time invested decreases heavily once holiday season is over in September and it increases again at around Easter holiday time, when people start going abroad to Italy or Croatia for example. To fix it by number of hours spent is simply too difficult and impossible to determine because it also depends whether the enquiry is highly time-consuming or not. There are enquires – and we will get to this in a minute as I can see from the questions – which require little time investment and some require a longer research.

Interviewer: What does the typical profile of the user look like?

Tauer: This is difficult to answer because it is part of the data protection and we do not look at our members. This means that when we receive an enquiry via email, we typically only see the name, the phone number and the club card number. We could

obviously take the club card number and enter it into our OTS and see who it is, but of course we do not do that. Sometimes one can see the academic degree so we can conclude he or she is an academic but we cannot say anything precisely about the member. However, I personally believe our users are mainly older people, but it varies hardly because we even get some enquiries via Facebook, which probably means they are younger than the typical user. However, as mentioned before, we cannot say anything precisely because we do not enter the club card number into the OTS.

Interviewer: Do you think the ÖAMTC can reach its target group with a Facebook chatbot? Or do you think a website chatbot would work better? Or do you believe a chat service would be the best alternative?

Tauer: Even though I just said we receive some enquiries via Facebook, we receive only relatively few questions via Facebook. I personally believe a Facebook chatbot would not necessarily be useful for us, our domain and our target group. A standard website chatbot might be useful to some extent, for example for the route planner when we receive simply to be standardised questions. However, most enquiries we receive are heavily time consuming and require a lot of research. This does not necessarily apply to the counter workers or the Landestouristiker, but to our enquiries. That is why I believe a chat service would make a lot more sense.

Interviewer: What do complex enquiries require? A fast reply? Are those enquiries always tailored to the individual person?

Tauer: Both. As I said, there are some enquiries which can be answered quickly and which the member could answer by itself if it would do some research on the website and the country database. However, the majority of enquiries are complex. Some of the enquiries are asked ahead of time, for example when someone drives through Siberia and crosses many borders or through China and these enquiries require a lot of research and time and they are specifically tailored to the individual. These complex enquiries take up almost all space as compared to easily answered ones.

Interviewer: Users of a chat service usually expect a quick answer. Do you think employees will face more work because they have to react more quickly?

Tauer: I believe so anyhow. Of course, we already make sure to answer every enquiry as fast as possible, but when you receive an email you can easily say I will answer that in an hour. We already established the rule that every enquiry should be answered in under two hours, even if it is just to say that the research will take up some more time. When an enquiry is sent in a chat, the reply will be delivered faster and more easily and you can ask for a more precise question. Of course, you can also answer stating that you will require some more time, but there is just a lower willingness to wait from the customer's side when it comes to a chat. So yes, I believe there will be more work facing the employees.

Appendix 3

This is the input-output-structure, which was provided to all four chatbot applications. However, for testing purposes only, the country and city list was limited to the desired destinations.

Intent name	Questions	Answer type	text
Welcome		Text	["Guten Tag, haben Sie eine touristische Frage an uns? Gerne versuche ich Ihnen weiterzuhelfen. Sollte ich Ihnen keine sofortige Auskunft geben können, meldet sich innerhalb weniger Werkzeuge ein Experte bei Ihnen."]
		Text	["Ich bin ein Chatbot und versuche Ihnen mit den gängigsten Fragen weiterzuhelfen. Für individuelle Fragen melden Sie sich per Mail oder Telefon. Gerne können Sie über die Vorschläge unten schnelle Antworten erhalten."]
Default		Text	["Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per Email kontaktieren

			möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun."]
Information_error	Ich möchte einen Fehler melden.	Text	["Vielen Dank, dass Sie uns bei der Fehlerbehebung helfen möchten - wir freuen uns über jede konstruktive Kritik. Gerne können Sie Ihre Fehlermeldung an xy@xy.at senden."]
	Ich habe einen Fehler zu melden.	Text	["Vielen Dank, dass Sie uns bei der Fehlerbehebung helfen möchten - wir freuen uns über jede konstruktive Kritik. Gerne können Sie Ihre Fehlermeldung an xy@xy.at senden."]
	Ich habe einen Fehler gefunden.	Text	["Vielen Dank, dass Sie uns bei der Fehlerbehebung helfen möchten - wir freuen uns über jede konstruktive Kritik. Gerne können Sie Ihre Fehlermeldung an xy@xy.at senden."]
	Es funktioniert etwas nicht.	Text	["Vielen Dank, dass Sie uns bei der Fehlerbehebung helfen möchten - wir freuen uns über jede konstruktive Kritik. Gerne können Sie Ihre Fehlermeldung an xy@xy.at senden."]
	Mir ist etwas aufgefallen.	Text	["Vielen Dank, dass Sie uns bei der Fehlerbehebung helfen möchten - wir freuen uns über jede konstruktive Kritik. Gerne können Sie Ihre Fehlermeldung an xy@xy.at senden."]
Information_city	Ich brauche Information zu einer Stadt.	Text	["Bei Fragen zu Städten finden Sie Auskunft in unserem CG. Zahlreiche europäische Städte stehen zur Auswahl."]
	Ich hätte gerne Informationen zu einer Stadt.	Text	["Bei Fragen zu Städten finden Sie Auskunft in unserem CG. Zahlreiche europäische Städte stehen zur Auswahl."]
	Ich möchte Informationen zu *city* .	Text	["Bei Fragen zu Städten finden Sie Auskunft in unserem CG. Zahlreiche europäische Städte stehen zur Auswahl."]

Information_ country	Ich brauche Informationen zu einem Land.	Text	["Bei Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt."]
	Ich hätte gerne Informationen zu einem Land.	Text	["Bei Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt."]
	Ich möchte Informationen zu *country* .	Text	["Bei Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt."]
Information_ enquiry	Ich habe eine Anfrage.	Text	["Spezielle Anfragen können Sie uns gerne per E-Mail an xy@xy.at zukommen lassen. Wir kümmern uns um eine schnelle Abwicklung."]
	Ich benötige Hilfe.	Text	["Spezielle Anfragen können Sie uns gerne per E-Mail an xy@xy.at zukommen lassen. Wir kümmern uns um eine schnelle Abwicklung."]
Information_ documents	Ich brauche Informationen zu Personaldokumenten in *country* .	Text	["Informationen zu Personaldokumenten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Welche Personaldokumente benötige ich in *country*?	Text	["Informationen zu Personaldokumenten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Welche Dokumente benötige ich in *country*?	Text	["Informationen zu Personaldokumenten zu allen Ländern der Welt finden Sie online in unserer LF."]

Information_ vehicle	Welche KFZ-Dokumente brauche ich in *country*?	Text	["Informationen zu Kraftfahrzeugdokumenten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Ich brauche Informationen zu KFZ-Dokumenten.	Text	["Informationen zu Kraftfahrzeugdokumenten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Ich hätte gerne Informationen zu KFZ-Dokumente in *country* .	Text	["Informationen zu Kraftfahrzeugdokumenten zu allen Ländern der Welt finden Sie online in unserer LF."]
Information_ luggage	Ich brauche Informationen zum Reisegepäck.	Text	["Informationen zu Reisegepäck zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was darf ich nach *country* einführen?	Text	["Informationen zu Reisegepäck zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was darf ich aus *country* ausführen?	Text	["Informationen zu Reisegepäck zu allen Ländern der Welt finden Sie online in unserer LF."]
	Welche Souvenirs sind in *country* verboten?	Text	["Informationen zu Reisegepäck zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was darf ich aus *country* mitnehmen?	Text	["Informationen zu Reisegepäck zu allen Ländern der Welt finden Sie online in unserer LF."]

Information_ safety	Wie sicher ist es in *country*?	Text	["Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie online in unserer LF."]
	Wie ist die Sicherheitslage in *country*?	Text	["Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie online in unserer LF."]
	Gibt es eine Reisewarnung für *country*?	Text	["Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie online in unserer LF."]
	Ist reisen nach *country* sicher?	Text	["Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie online in unserer LF."]
Information_ carrental	Was muss ich bei einem Mietwagen beachten?	Text	["Informationen zu Mietwägen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was muss ich bei Mietwägen in *country* beachten?	Text	["Informationen zu Mietwägen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was benötige ich, um ein Auto in *country* auszuleihen?	Text	["Informationen zu Mietwägen zu allen Ländern der Welt finden Sie online in unserer LF."]
Information_ border	Ich brauche Informationen zu Grenzübergängen nach *country* .	Text	["Informationen zu Grenzübergängen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was muss ich bei einem	Text	["Informationen zu Grenzübergängen zu allen Ländern der Welt finden Sie online in unserer LF."]

	Grenzübergang beachten?		
Information_toll	Wieviel kostet die Vignette in *country* ?	Text	["Informationen zu Maut und Vignetten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Wie teuer ist die Vignette in *country* ?	Text	["Informationen zu Maut und Vignetten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Welche Arten von Vignette gibt es in *country* ?	Text	["Informationen zu Maut und Vignetten zu allen Ländern der Welt finden Sie online in unserer LF."]
	Ich brauche Informationen zur Maut in *country* .	Text	["Informationen zu Maut und Vignetten zu allen Ländern der Welt finden Sie online in unserer LF."]
Information_traffic	Wie schnell darf ich in *country* fahren?	Text	["Informationen zu Verkehrsbestimmungen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Muss ich in *country* das Licht am Tag einschalten?	Text	["Informationen zu Verkehrsbestimmungen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Was muss ich in *country* mitführen?	Text	["Informationen zu Verkehrsbestimmungen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Welche Promillegrenzen	Text	["Informationen zu Verkehrsbestimmungen zu allen Ländern der Welt finden Sie online in unserer LF."]

	gelten in *country*?		
	Gibt es Bestimmungen zur Kindersicherung in *country*?	Text	["Informationen zu Verkehrsbestimmungen zu allen Ländern der Welt finden Sie online in unserer LF."]
Information_ emergency	Wen muss ich bei einer Panne in *country* anrufen?	Text	["Informationen zu Pannenhilfe und Notfall zu allen Ländern der Welt finden Sie online in unserer LF."]
	Wie lauten die Notrufnummern in *country*?	Text	["Informationen zu Pannenhilfe und Notfall zu allen Ländern der Welt finden Sie online in unserer LF."]
	Ist der ÖAMTC international erreichbar?	Text	["Informationen zu Pannenhilfe und Notfall zu allen Ländern der Welt finden Sie online in unserer LF."]
	Wie erreiche ich die Polizei in *country*?	Text	["Informationen zu Pannenhilfe und Notfall zu allen Ländern der Welt finden Sie online in unserer LF."]
Information_ contact	Wie erreiche ich das Konsulat in *country*?	Text	["Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF."]
	Wie erreiche ich einen Partnerclub des ÖAMTCs in *country*?	Text	["Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF."]

Information_ semesterabroad	Ich hätte gerne Informationen zu Auslandssemester	Text	["Alle Informationen rund um das Thema Auslandssemester finden Sie in der RP."]
	Ich benötige Information zum Auslandssemester	Text	["Alle Informationen rund um das Thema Auslandssemester finden Sie in der RP."]
Information_legal	Welche Rechte habe ich beim Konkurs einer Airline?	Text	["Alle Informationen rund um das Thema Passagier-Rechte beim Konkurs einer Airline finden Sie in der RP."]
	Bekomme ich beim Konkurs der Airline Geld zurück?	Text	["Alle Informationen rund um das Thema Passagier-Rechte beim Konkurs einer Airline finden Sie in der RP."]
	Gilt meine Versicherung im Ausland?	Text	["Alle Informationen rund um das Thema Versicherung im Ausland finden Sie in der RP."]
	Brauche ich eine Versicherung im Ausland?	Text	["Alle Informationen rund um das Thema Versicherung im Ausland finden Sie in der RP."]
	Was tun wenn meine Airline streikt?	Text	["Alle Informationen rund um das Thema Tipps für Betroffene von Streiks bei Fluglinien finden Sie in der RP."]
	Brauche ich eine Reisestornoversicherung?	Text	["Alle Informationen rund um das Thema Reisestornoversicherung finden Sie in der RP."]

Was bringt eine Reisetornoversicherung?	Text	["Alle Informationen rund um das Thema Reisetornoversicherung finden Sie in der RP."]
Was sind die Vorteile einer Reisetornoversicherung?	Text	["Alle Informationen rund um das Thema Reisetornoversicherung finden Sie in der RP."]
Mängel im Urlaub reklamieren	Text	["Alle Informationen rund um das Thema Richtig reklamieren bei Mängeln im Urlaub finden Sie in der RP."]
Deckt eine Reisetornoversicherung auch Umweltkatastrophen ab?	Text	["Alle Informationen rund um das Thema Reisetorno bei Umweltkatastrophen und Unruhen finden Sie in der RP."]
Wozu benötige ich eine Grüne Karte?	Text	["Alle Informationen rund um das Thema Grüne Karte bei Autoreisen finden Sie in der RP."]
Rechte bei Pauschalreisen Insolvenz	Text	["Alle Informationen rund um das Thema Pauschalreisen: Anzahlung & Insolvenz finden Sie in der RP."]
Fehler vermeiden bei Mietauto	Text	["Alle Informationen rund um das Thema Mietautofallen finden Sie in der RP."]
Ich benötige eine Vollmacht für ein Kind.	Text	["Alle Informationen rund um das Thema Vollmacht für alleinreisende Kinder finden Sie in der RP."]
Woher bekomme ich eine Vollmacht für ein Kind?	Text	["Alle Informationen rund um das Thema Vollmacht für alleinreisende Kinder finden Sie in der RP."]

	Wann benötigt mein Kind eine Vollmacht?	Text	["Alle Informationen rund um das Thema Vollmacht für alleinreisende Kinder finden Sie in der RP."]
	Was tun wenn mein Gepäck verloren geht?	Text	["Alle Informationen rund um das Thema Gepäckverlust finden Sie in der RP."]
Information_trafficabroad	Welche Promillegrenzen gelten im Ausland?	Text	["Alle Informationen rund um das Thema Promillegrenzen in den Nachbarländern finden Sie in der RP."]
	Was muss ich im Ausland als Motorradfahrer mitführen?	Text	["Alle Informationen rund um das Thema Mitführipflichten für Motorradfahrer in Europa finden Sie in der RP."]
	Was muss ich im Ausland mitführen?	Text	["Alle Informationen rund um das Thema Mitführipflichten für Autofahrer in Europa finden Sie in der RP."]
	Gilt Licht am Tag auch im Ausland?	Text	["Alle Informationen rund um das Thema Licht am Tag in Europa finden Sie in der RP."]
	Informationen zum Internationalen Zulassungsschein	Text	["Alle Informationen rund um das Thema Internationaler Zulassungsschein finden Sie in der RP."]
	Gilt meine E-Card im Ausland?	Text	["Alle Informationen rund um das Thema E-Card Europäische Krankenversicherungskarte finden Sie in der RP."]

	Informationen zum Carnet de Passages	Text	["Alle Informationen rund um das Thema Carnet de Passages finden Sie in der RP."]
	Wie teuer ist Maut in Europa?	Text	["Alle Informationen rund um das Thema Maut-Regelungen in Europa finden Sie in der RP."]
	Wie teuer sind Verkehrsstrafen im Ausland?	Text	["Alle Informationen rund um das Thema Verkehrsstrafen im Ausland finden Sie in der RP."]
	Informationen zu Umweltzonen in Deutschland	Text	["Alle Informationen rund um das Thema Umweltzonen in Deutschland finden Sie in der RP."]
	Wie schnell darf ich im Ausland fahren?	Text	["Alle Informationen rund um das Thema Tempolimits auf Europas Straßen finden Sie in der RP."]
	Welche Tempolimits gelten im Ausland?	Text	["Alle Informationen rund um das Thema Tempolimits auf Europas Straßen finden Sie in der RP."]
	Welche Geschwindigkeitsbegrenzungen gelten im Ausland?	Text	["Alle Informationen rund um das Thema Tempolimits auf Europas Straßen finden Sie in der RP."]

city	country	country	country	country
Athen	Algerien	Äquatorialguinea	Brunei Darussalam	Salomonen

Barcelona	Angola	Äthiopien	China	Samoa (amerikanisch)
Florenz	Benin	Antigua/Barbuda	Georgien	Samoa (West)
Istanbul	Botswana	Argentinien	Hongkong	Tonga
Lissabon	Burkina Faso	Bahamas	Indien	Tuvalu
Madrid	Burundi	Barbados	Indonesien	Vanuatu
Mailand	Demokratische Republik Kongo	Belize	Irak	Österreich
Rom	Djibouti	Bermuda	Iran	Albanien
Venedig	Elfenbeinküste	Bolivien	Israel	Andorra
Amsterdam	Eritrea	Brasilien	Japan	Austria
Hamburg	Gabun	Cayman Inseln	Jemen	Belarus (Weißrussland)
Kopenhagen	Gambia	Chile	Jordanien	Belgien
Stockholm	Ghana	Costa Rica	Kambodscha	Bosnien & Herzegowina
Warschau	Guinea	Dominika	Kasachstan	Bulgarien
Berlin	Guinea - Bissau	Dominikanische Republik	Katar	Deutschland

Bratislava	Kamerun	Ecuador	Kirgisistan	Dänemark
Brüssel	Kap Verde	El Salvador	Korea - Nord (Volksrepublik)	Estland
Budapest	Kenia	Französisch Guayana	Korea - Süd (Republik)	Finnland
Graz	Komoren	Grenada	Kuwait	Frankreich
Klagenfurt	Kongo	Guadeloupe	Laos	Fürstentum Liechtenstein
Linz	Lesotho	Guatemala	Libanon	Griechenland
London	Liberia	Guyana	Macau	Großbritannien
München	Libyen	Haiti	Malaysia	Irland
Paris	Madagaskar	Honduras	Malediven	Island
Prag	Malawi	Jamaika	Mongolei	Italien
Salzburg	Mali	Jungferninseln - amerikanisch	Myanmar	Kosovo
St. Pölten	Marokko	Jungferninseln - britisch	Nepal	Kroatien
Wien	Mauretanien	Kanada	Oman	Lettland
Zürich	Mauritius	Kolumbien	Pakistan	Litauen
	Mayotte	Kuba	Philippinen	Luxemburg
	Mosambik	Martinique	Saudi Arabien	Malta

	Namibia	Mexiko	Singapur	Mazedonien
	Niger	Montserrat	Sri Lanka	Moldau
	Nigeria	Nicaragua	Syrien	Monaco
	Reunion	Niederl. Karibik-Inseln	Tadschikistan	Montenegro
	Ruanda	Panama	Taiwan	Niederlande
	Sambia	Paraguay	Thailand	Norwegen
	Sao Tome & Principe	Peru	Timor-Leste	Polen
	Senegal	St. Kitts und Nevis	Turkmenistan	Portugal
	Seychellen	St. Lucia	Usbekistan	Rumänien
	Sierra Leone	St. Vincent und die Grenadinen	Vereinigte Arabische Emirate	Russische Föderation
	Simbabwe	Suriname	Vietnam	San Marino
	Somalia	Trinidad und Tobago	Australien	Schweden
	Sudan	Puerto Rico	Cook-Islands	Schweiz
	Swasiland	Uruguay	Fidschi-Inseln	Serbien
	Südafrika	USA	Französisch Polynesien	Slowakei
	Südsudan	Venezuela	Kiribati	Slowenien

	Tansania	Afghanistan	Marshall- Inseln	Spanien
	Togo	Armenien	Mikronesien	Tschechien
	Tschad	Aserbaidtschan	Nauru	Türkei
	Tunesien	Bahrain	Neukaledonie n	Ukraine
	Uganda	Bangladesch	Neuseeland	Ungarn
	Zentralafrikanisc he Republik	Bhutan	Papua Neuguinea	Zypern
	Ägypten			

Appendix 4

These are the tables from testing the respective chatbots, including the correctness of the chatbots' output provision. Based upon these tables, the scored metrics were calculated.

Chatfuel	Input	Output	Correct/incorrect
	Wo finde ich Informationen zu Estland?	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder	Incorrect

		per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.	
	Information Estland	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct
	Estland Information	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct
	Informationen Estland	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur	Correct

		Auswahl stehen alle Länder der Welt.	
	Estland Informationen	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct
	Wo finde ich Informationen zu London?	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.	Incorrect
	Information London	Leider konnten wir Ihre Anfrage	Incorrect

		<p>nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	
	London Information	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	Incorrect

	Informationen London	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	Incorrect
	London Informationen	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43</p>	Incorrect

		123456789 oder xy@xy.at tun.	
	Wo finde ich Informationen Sicherheitslage Ägypten?	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.	Incorrect
	Sicherheitslage Ägypten	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so	Incorrect

		können Sie das gern unter +43 123456789 oder xy@xy.at tun.	
	Ägypten Sicherheitslage	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.	Incorrect
	Wie teuer ist die Maut in Slowenien?	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail	Incorrect

		<p>kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	
	Maut Slowenien	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	Incorrect
	Slowenien Maut	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen</p>	Incorrect

		<p>telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	
	<p>Wie erreiche ich das Konsulat in Spanien?</p>	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.</p>	<p>Incorrect</p>
	<p>Konsulat Spanien</p>	<p>Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden.</p>	<p>Incorrect</p>

		Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.	
	Spanien Konsulat	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +43 123456789 oder xy@xy.at tun.	Incorrect
	konsulat spanien	Leider konnten wir Ihre Anfrage nicht sofort bearbeiten und ein Experte wird	Incorrect

		sich in kurzer Zeit bei Ihnen melden. Sollten Sie uns inzwischen telefonisch oder per E-mail kontaktieren möchten, so können Sie das gern unter +3123456789 oder xy@xy.at tun.	
	spanien konsulat	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct

ItsAlive	Input	Output	Correct/incorrect
	Wo finde ich Informationen zu Estland?	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect

	Information Estland	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Estland Information	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Informationen Estland	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Estland Informationen	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Wo finde ich Informationen zu London?	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect

	Information London	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	London Information	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Informationen London	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	London Informationen	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Wo finde ich Informationen zur Sicherheitslage in Ägypten?	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect

	Sicherheitslage Ägypten	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Ägypten Sicherheitslage	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Wie teuer ist die Maut in Slowenien?	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Maut Slowenien	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect
	Slowenien Maut	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Incorrect

	Wie erreiche ich das Konsulat in Spanien?	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
	Konsulat Spanien	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
	Spanien Konsulat	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
	spanien konsulat	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct

Onlim	Input	Output	Correct/incorrect
	Wo finde ich Informationen zu Estland?	Bei generellen Fragen zu einem spezifischem Land	Correct

		erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	
	Information Estland	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct
	Estland information	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct
	Informationen Estland	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct

	Estland Informationen	Bei generellen Fragen zu einem spezifischem Land erhalten Sie Auskunft in unserer LF. Zur Auswahl stehen alle Länder der Welt.	Correct
	Wo finde ich Informationen zu London?	Bei generellen Fragen zu einer spezifischen Stadt erhalten Sie Auskunft in unserem CG. Zur Auswahl stehen zahlreiche europäische Städte.	Correct
	Information London	Bei generellen Fragen zu einer spezifischen Stadt erhalten Sie Auskunft in unserem CG. Zur Auswahl stehen zahlreiche europäische Städte.	Correct
	London Information	Bei generellen Fragen zu einer spezifischen Stadt	Correct

		erhalten Sie Auskunft in unserem CG. Zur Auswahl stehen zahlreiche europäische Städte.	
	Informationen London	Bei generellen Fragen zu einer spezifischen Stadt erhalten Sie Auskunft in unserem CG. Zur Auswahl stehen zahlreiche europäische Städte.	Correct
	London Informationen	Bei generellen Fragen zu einer spezifischen Stadt erhalten Sie Auskunft in unserem CG. Zur Auswahl stehen zahlreiche europäische Städte.	Correct
	Wo finde ich Informationen zur	Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie	Correct

Sicherheitslage in Ägypten?	online in unserer LF.	
Sicherheitslage Ägypten	Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
Ägypten Sicherheitslage	Informationen zu Sicherheitslage zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
Wie teuer ist die Maut in Slowenien?	Informationen zu Maut und Vignetten zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
Maut Slowenien	Informationen zu Maut und Vignetten zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
Slowenien Maut	Informationen zu Maut und Vignetten zu allen Ländern der Welt	Correct

		finden Sie online in unserer LF.	
	Wie erreiche ich das Konsulat in Spanien?	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
	Konsulat Spanien	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
	Spanien Konsulat	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct
	spanien konsulat	Informationen zu wichtigen Adressen zu allen Ländern der Welt finden Sie online in unserer LF.	Correct