USER AND CUSTOMER SUPPORT
Handouts for trainers

Introductory instructions for trainers

We have prepared materials for trainers to follow. They include

- Introduction
- The complete texts as read by the machine voice. The trainer can choose what to say, for example by highlighting certain sentences or concepts.
- Recommendations on where to turn the sound on or off

The presentation can run in two modes

- With audio on
- Without audio on

Presentation with audio on

- In this mode, a machine voice is heard explaining the displayed texts, diagrams and animations.
- This mode is suitable for self-learning.
- The trainer is not recommended to go through the entire content in this way. The trainee's attention may be lost, and the trainee may not focus on what is most important in the content.
- We recommend using this mode no more than 2 times during the presentation.

Presentation with audio off

- If the presenter turns off the sound, they can give the participants an abbreviated version of what the machine voice is saying in the background.
- They can also highlight what is most important about the content being shown.
- The trainer needs to go through the course several times.
- This is because the background machine voice is running all the time, and until the narration is finished, the trainer has no opportunity to move on to the next step in the presentation.

The trainer can either

- do the content switching and scrolling on their own (recommended for online webinars)
- **or** their partner can do it, but it has to be well coordinated with them (recommended for larger audiences)

Link to the course

https://paitool.eu/courses/paitool-course/lessons/user-and-customer-support/

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Educational objectives

Each presenter must understand their educational objectives. In the case of AI, participants should gain the following knowledge:

- Understand artificial intelligence as an information system that is capable of learning,
- Know how to identify those processes where it makes sense to use artificial intelligence or machine learning,
- Know the prerequisites for deploying AI in the conditions of a specific company, such as the need for data, the personnel required, etc,
- Recognize the benefits of implementing AI and the risks associated with implementing the project.

Course of training

Introduction

Hello. Welcome to the presentation on digitalization and the use of artificial intelligence in customer service and user support. Today's contact centre and help desk environment faces many challenges. We will present how to use AI to bring innovation and effective solutions. Together, we will look at examples, problems, and most importantly, the solutions that the new era of customer service can offer.

I will now play a presentation, the voice of which belongs to artificial intelligence, as a demonstration of one of its capabilities.

START THE PRESENTATION

Slide 1 - Introduction

Digitization scenario using artificial intelligence

Slide 2 - Introductory example

Slide 3 - User and customer support

Today, companies and other institutions serve many customers, using contact centres for mass sales, marketing, or technical support of their employees. They solve problems with products, complaints, failures in the use of equipment, or answer questions from clients.

The workplaces that provide this support are called contact centres or help desks. They employ many people, and this can cause problems.

Problems in companies and other institutions that serve large numbers of users.

Click on the number buttons for more information.

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1. Labour costs

The workforce is expensive. This is even more true if they work at night and during the holidays.

2. Limited staff performance

One employee can serve only one client at a time or solve only one reported problem. In addition, employee performance changes over time, and people are subject to fatigue. They are less effective when they are distracted. Their performance may also be influenced by their mood or personal problems.

3. Staff turnover and dropouts

Workers come and go, and every change is reflected in the quality of the service provided. The retraining of a new employee drains the capacities of colleagues and superiors. It is also difficult to replace operators' dropouts due to illness.

4. Limited possibility to work with data

Humans can only work with a limited amount of information and are not capable of analysing large data sets and applying the analysis in a specific situation. The data from other successfully or unsuccessfully resolved cases are not exploited. It is complicated to work with the history of a particular customer, and the possibility of designing a precisely targeted service or product is lost.

5. Professional and language competence

In many cases, help desk or sales staff need specialized knowledge and cannot solve a broader range of problems. Their language skills are also limited to a maximum of a few languages. They cannot serve users, who are often all over the world.

Slide 4 - Solution using chatbot and artificial intelligence

A virtual digital assistant is an information and communication system that responds to human requirements. We can call it a chatbot.

STOP THE SOUND OF THE PRESENTATION

The text will be retold by the speaker in their own words while clicking the buttons with numbers:

1. It can be used on standard devices

It is available on most devices that target users work with, such as mobile phones or personal computers.

2. It communicates in natural language

It can communicate through messages or even by voice.

3. It can be connected to social networks

It can be integrated with popular applications or social networks such as Facebook or Slack.

4. It uses company databases and documents

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It can be supplemented by knowledge search in the provided documents, provision of information from databases and information systems, and running other computer programs.

5. It connects users to human operators

If it cannot help the user, it can connect him to a human call centre operator.

6. It can also take the form of an avatar

It can take the form of an animated character that appears on the user's device and speaks in an almost natural voice.

7. It uses artificial intelligence

Modern chatbots use artificial intelligence.

START THE PRESENTATION SOUND

Slide 5 - How it all works

Chatbot consists of several blocks. Each of them performs a unique function.

1. **Communication channel**

The communication channel can be a web interface or part of a web page. Chatbot frameworks often provide the ability to connect to popular applications or social networks easily. It is also possible to add authentication to this block. The most used chatbots are in the form of a messenger, in which the user writes down his requests and receives text responses. More advanced chatbots can communicate by voice. You will learn more about how to do this soon. Sometimes the chatbots also have a graphic form, such as an animated character of the contact centre operator.

2. **Natural Language Understanding (NLU)**

The purpose of this block is to understand the text entered by the user, which is called intent. The result is the recognition of one of the closed set of intentions. In case of low trust, the algorithm can write a backup response. For example, "I don't understand you; please try rewording the sentence."

The core of this block is the machine learning model for text classification.

3. **Named Entity Recognition (NER)**

It is an optional function, used almost always in practice. This block ensures the recognition of entities in the text entered by the user. There are several tools for recognizing simple entities such as first name, last name, and address. You must create your unique dataset to recognize specific corporate entities. This is done by identifying the entity in the text and then training the artificial intelligence model.

4. **Dialog Manager (DM)**

This block provides dialogue control. The dialogue management system monitors what intentions have been recognized in the NLU, which entities have been identified, and then provides an action. The standard action is a response, i.e., text, audiovisual content, information from an external system, the result of a program, or information sought in knowledge or documents. The core of this block is the machine learning model. The more conversation options are defined in the training data, the better the dialogue management works.

5. **Automatic Speech Recognition (ASR)**

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This is an optional component. This system transforms the user's speech into text. Automatic speech recognition systems currently operate with an error rate of up to 5%. Standard automatic speech recognition systems can only recognize words in a dictionary, which is reasonably limited for several reasons. For example, for specific domains such as healthcare, law, colloquial speech, etc. Designing your own automatic speech recognition system is very difficult and, in addition to experts in the field, also requires a lot of training data, which is very expensive.

6. The Text to Speech system (TTS)

It is also optional. It is also known as speech synthesis and converts text responses to speech. It is achieving excellent results, and the speech sounds almost natural. It is recommended to use cloud services that contain well-trained models. The text you are listening to was also created this way. Creating your text-to-speech system is complex and requires processing by experts in the field and high-quality speech data with accurate time-aligned transcripts.

STOP THE PRESENTATION

Discussion 1

1. *Are you registering an increased interest in smart solutions like chatbots lately or let's say since Covid?*
2. *If so, what types of companies are involved? Larger or smaller businesses? Can the most active sectors be identified? Does this apply to your business as well?*
3. *To what extent is your company also dealing with the idea of becoming producers as well as consumers? So-called PROSUMERS?*
4. *Do companies have clarity on the topic of energy management? Are they clear about what all Smart Energy solutions encompass?*
5. *Do customers also directly express a demand for the introduction of artificial intelligence? At least indirectly, e.g., by requesting the generation of predictions or the processing of unstructured data or similar?*
6. *How long does it typically take you to negotiate with suppliers from first contact to contract and project start?*

START THE PRESENTATION

START THE PRESENTATION SOUND

Slide 6 - Presumptions

Slide 7 - Choosing the right areas of use

Chatbots are commonly used mainly in the following areas:

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The text will be retold by the speaker in their own words:

Contact centres

Contact centres - a chatbot can serve some customers contacting the call centre. More manageable tasks are handled by chatbots very well, such as displaying the invoice amount. If the chatbot cannot meet the user's requirements, it can automatically connect the user to the operator.

Providing information to users

Providing information to users – a chatbot can provide users with information from available documents, answer frequently asked questions, or help diagnose a problem and identify a failure.

Self-service systems

Self-service systems - The user can order or modify a service or change system settings using self-service chatbots. In this case, authentication is required.

Advertising campaigns

Advertising campaigns - a chatbot for the ad campaigns can inform the user about the discounts, and the chatbot, not the user, triggers the conversation.

START THE PRESENTATION SOUND

Slide 8 - Data

Data for machine learning is required for

- Natural Language Understanding
- Named Entity Recognition
- Dialog Manager

Different chatbot functions are activated in each human-chatbot communication phase, and diverse data sources are used.

Training data for Natural Language Understanding must be created manually. In the case of individual intentions, it is necessary to define several options, which the user could write. The more options listed, the more natural it will be to communicate with the chatbot, and the sooner it will understand what we want from it.

There are two ways to prepare data for the Named Entity Recognition block. The first is freely available models, which recognize only a limited number of different entities. The second option is to identify individual entities in the training data, specifically in the Natural Language Understanding training data.

The most complicated and lengthy is preparing data for the Dialog Manager. In this dataset, it is necessary to symbolically write all or at least a significant majority of the possibilities for the development of dialogue. It is possible to define several response options to make the communication more natural and less machine-like. Chatbot then randomly selects a reply from the set of answers. For example, the answer to saying goodbye might be: "Goodbye," "Have a nice day," and so on.

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Slide 9 - Information systems

Chatbot solutions can be created using a cloud service or on your own devices. Cloud services are paid by default according to the number of sessions; in the case of speech recognition and text-to-speech systems, they are paid by the recording length in seconds. Today, cloud services and frameworks are designed to be easily integrated into the final solution.

The computational load generally depends on the machine learning methods used in the individual modules. More powerful hardware is needed to work with the spoken text.

There are two possible solutions:

- cloud service
- own facilities

STOP THE SOUND OF THE PRESENTATION

The text will be retold by the speaker in their own words:

Slide 10 – People 1

The supplier can solve the software part of the chatbot solution. However, it will also be necessary to create communication content, and the most competent people for its creation are employees of the company that wants to deploy the chatbot.

On the client's side:

Sponsor - the owner of the project, the person who handles the resources for funding

The top position on the customer side is the project sponsor, who is responsible for its financing and ensures the necessary cooperation or eliminates resistance to change.

Expert on the provided service - expert on the process, provides data samples and other necessary inputs.

From a technical point of view, the critical role is an expert in customer service or help-desk support. He collaborates with data scientists on identifying problems and goals, providing the necessary information, data, and process inputs

Support team - responsibility for partial tasks, artificial intelligence training

Employees responsible for customer service, sales, quality, and timeliness of service in the existing help desk, call centre, etc., are also important. They form a support team that performs partial tasks and oversees artificial intelligence training.

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IT specialist - is responsible for the operation of computer technology and network infrastructure

If automation applications are operated on the client's infrastructure, it is necessary to have an IT expert in the team, ensuring deployment and subsequent operational tasks.

START THE PRESENTATION SOUND

Slide 11 - People 2

On the supplier's side, it is necessary to have enough of the following profiles available:

Data scientists who prepare, study, visualize and model;

Data engineers manage the data and the relevant data platform to make it fully operational for analysis;

Experts in the technology of a particular chatbot;

IT architects, who manage the basic infrastructure needed to support data science;

Application developers with knowledge of machine learning algorithms who deploy models to applications;

ICT specialists responsible for implementing the solution in terms of both software and hardware;

A consultant with knowledge of GDPR is also responsible for anonymizing data.

Slide 12 - Organization

Practical cooperation of the professional teams of the supplier and the contracting authority is essential for the success of the project. Fundamental factors, in this case, are a project plan with appropriately set milestones, a communication model defining the system of project meetings, but mainly sufficient allocation of professional teams, and a flexible process model supporting the proactive definition of requirements and timely response to suggestions of the implementation team.

Project plan

- appropriately set milestones and sub-objectives of the project

Communication model

- interaction of professional teams
- regular meetings
- formulation of requirements
- responding to suggestions from the implementation team

Human capacity

- sufficient allocation of the experts
- flexible process model

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STOP THE SOUND OF THE PRESENTATION

STOP THE PRESENTATION

Discussion 2

1. *Building an IT environment is a gradual process; it starts with simpler solutions and can progress to artificial intelligence. What does this evolution look like in the cases you have personally encountered?*
2. *In your opinion, is the customer willing to pay for the analysis of their needs as well, or are they trying to take on this role themselves? When you come into contact with supplier companies, to what extent do you have clarity on what you need?*
3. *What problems do you encounter in getting data? Do we mean both technical problems (fragmented and distributed data) and, say, organisational or competency problems?*
4. *How many of your projects are about integrating your solution to third-party systems? How did it work, was it necessary to involve the suppliers of these solutions or did you as a client manage it with your own staff?*
5. *How long does the project probably take?*
6. *Did you experience any problems in getting sufficiently skilled staff? Did you have trouble freeing them up in sufficient numbers for the project?*
7. *What has been your experience supporting management? Are they aware of their role in the project?*

START THE PRESENTATION

Slide 13 - Benefits and risks

Slide 14 - Benefits

Following the introduction of the artificial intelligence chatbot, several vital benefits can be expected. Among the most important are:

STOP THE SOUND OF THE PRESENTATION

The text will be retold by the speaker in their own words:

Qualitative benefits:

- Increasing the number of served customers or problems solved
- Increased quality, thanks to the removal of the human factor
- Faster and targeted customer service
- Availability 24/7

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- Process automation
- Data collection to streamline the process and simultaneously improve the quality of machine learning
- Data analysis that can be used online

START THE PRESENTATION SOUND

Slide 15 - Benefits

In addition to the qualitative benefits, some benefits can be quantified.

Quantitative benefits:

Savings. Staff costs are much higher than costs for a chatbot solution. The savings are mainly on a smaller number of contact centre employees;

Higher yields. In the case of cloud solutions, you pay for each session, so the costs are paid gradually, and the return on investment is faster. In the case of development, it is necessary to count on the purchase or programming of your solution, the purchase of your servers with hardware accelerators, and the operating costs for administering these servers. This means that the return on investment is slower. In both cases, however, creating communication content and knowledge of the chatbot is necessary.

Slide 16 - What we should be careful about

As with any project, there are several risks to deploying a virtual digital assistant that can harm a successful outcome.

STOP THE SOUND OF THE PRESENTATION

The text will be retold by the speaker in their own words:

What we should be careful about

Poor datasets

Poor dataset creation means a serious project risk. Mainly for the dialog manager. In this case, communication with the chatbot can be chaotic, and user acceptance is shallow. This can hurt the return on investment.

Unsuccessful implementation

Hasty and ill-considered implementations often end in disappointment and zero or negative benefits for the company. Rather, such a solution may discourage customers from cooperating with the company or reusing the service.

Exaggerated expectations from artificial intelligence

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Artificial intelligence alone does not guarantee the successful resolution of requirements. For example, it cannot replace the messy work of service technicians. It also fails to eliminate dissatisfaction with the slow resolution of product complaints.

Personal data privacy

There is also a high risk of insufficiently implemented GDPR. This can lead to significant, even liquidation fines. Company management must also consider internal data protection guidelines. In the case of using cloud solutions, it is necessary to anonymize the personal data before entering the cloud and then reconstruct it after exiting the cloud.

STOP THE PRESENTATION

Discussion 3

1. *Do you have a solid business plan and payback calculation at the beginning of the project? If so to what extent are these realistic cost-benefit calculations?*
2. *Have you been able to frame the cost of the project in past cases? What might the price be based on?*
3. *What are the most common false expectations you have registered in your projects?*
4. *How long after project deployment did you contact the contractor for assistance? Did they provide it under warranty, or was it for services beyond warranty?*
5. *Is there an ex-post cost-benefit evaluation after the project is completed in the company?*

START THE PRESENTATION

Slide 17 - This course was created in collaboration

STOP THE PRESENTATION

Conclusion:

In conclusion, we would like to emphasize that properly implemented chatbots and digital assistants can effectively manage communication with users, reduce labour costs and improve the overall quality of services provided.

However, when developing and deploying chatbots, it is essential to pay attention to the quality of datasets, proper implementation and realistic expectations. Data privacy is a key consideration and therefore compliance with GDPR regulations is essential.

Ultimately, the success of the project is dependent on effective collaboration between the vendor and client's expert teams, a transparent project plan and a flexible process model.

We hope that our presentation has provided you with useful information and inspiration for the future of digital customer service.

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