# Ultimate guide to implementing Conversational AI in your business

stagezero.ai

What is Conversational AI and how does it work?

Conversational AI is a set of technologies that intelligently understand and form responses to text and speech given by the users. Popular examples include virtual assistants and chatbots. A recent report from Juniper Research forecasts that AI-powered chatbots will handle up to 70% of customer conversations by the end of 2023.

Conversational AI uses a combination of machine learning, natural language processing (NLP), and substantial amounts of data. This helps translate human conversations into what machines can understand and generate replies from information they learn from a specific given database.

With conversational AI, machines can learn to execute tasks such as recognizing speech and text, translation, and having human-like conversations.
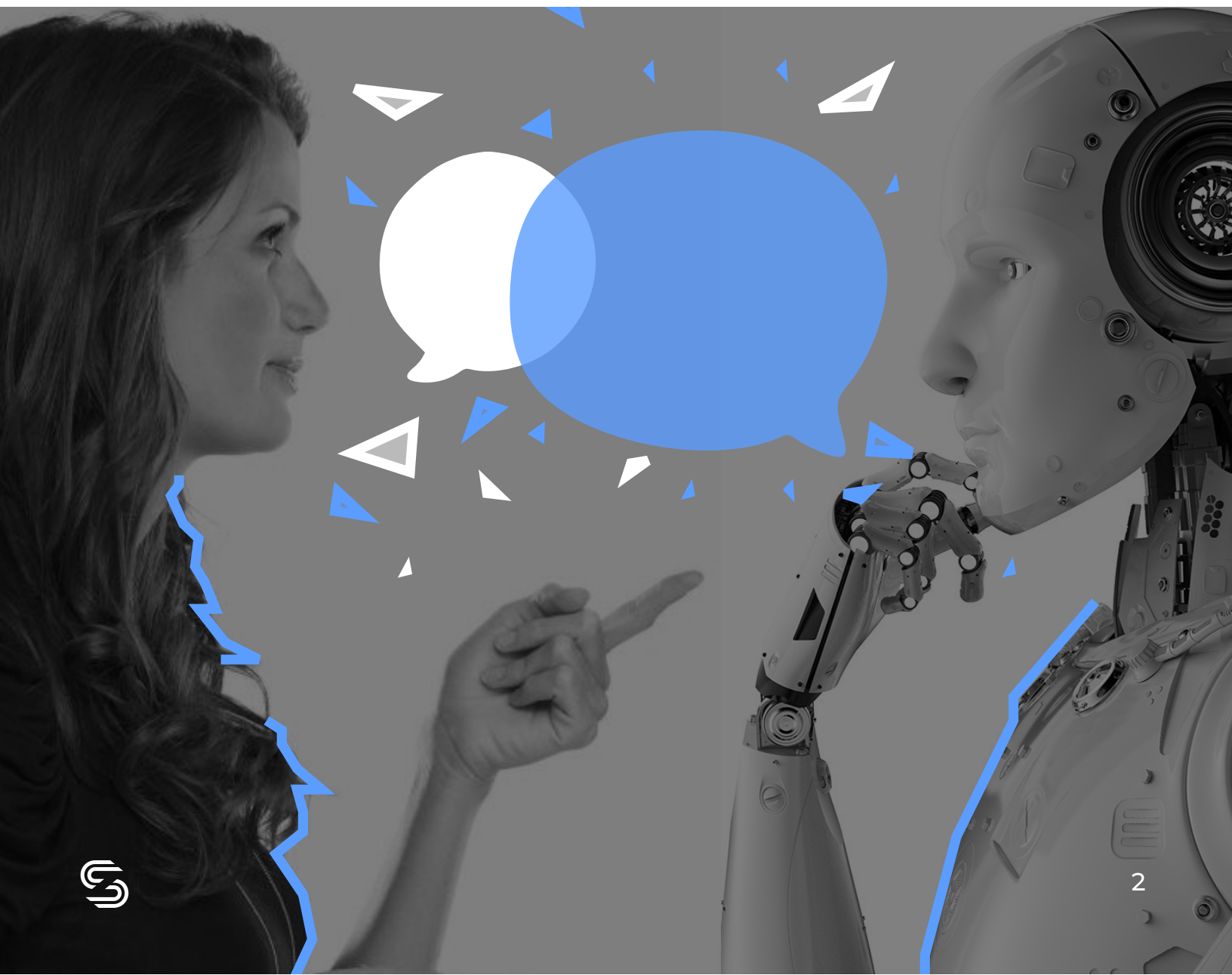
Types of Conversational AI technologies

- **Voice assistants:** A digital software that is usually used on electric devices such as smartphones, with the ability to recognize humans' voice commands, translate them into what machines can understand, then perform the requested tasks. A voice assistant uses voice recognition, NLP algorithms, and voice synthesis.
- **Chatbots:** Using AI and NLP, chatbots are computer programs that understand, simulate and process written or spoken human conversations. Chatbots are popularly used in customer service in order to help with responding to customer enquiries.
- **Interactive voice response (IVR):** Automated phone systems that respond to voice and keypad commands.
- **Virtual assistants:** Algorithms are used with an avatar interface to automate customer interactions or assist enterprises with repetitive administrative tasks. Usually, these technologies can combine voice assistance and text-based tasks, for example, to assist a customer with their invoice or to understand that an executive is asking them to retrieve a key phrase from a document.

Conversational AI use cases

Businesses use conversational AI for many purposes, but let's look at the most common use cases.

Customer service

Call centers and call automation

Recent advances in AI have now made it possible to reduce costs in call center use cases by over 50%. New AIs are available that can understand the speaker's intent in virtually any language and can be integrated into any calling system. The AIs are built to listen and react to calls in real time. Examples of use cases are calling forwarding, and doing various actions as identified in the call such as checking availability or people and/or requesting callbacks. To read more about the available solution, click underline.

Chatbots

The customer service industry utilizes chatbots in multiple ways, including greeting and offering around-the-clock assistance, personalized support and recommendations, and self-service options. Today over 25% of customer service interactions are handled by conversational AI agents, a number that is growing consistently regardless of industry.

By handling a certain amount of less complex, repetitive customer enquiries such as FAQs, conversational AI reduces call handling times by an average of 30% and enables human agents to work on more complicated tasks, hence enhancing efficiency and customer experience.

Self-service is now better than ever before! Businesses that successfully implemented conversational AI now have access to a much better leveraged database, which enhances customer self-service experience.

Overall, an increase in customer-case closure and decrease in response times can only mean a boost in business efficiency and customer satisfaction.

E-Commerce

Conversational AI is popular among online retailers also for the emergence of chatbots. It's estimated that by 2027, 80% of e-commerce platforms will use AI-driven automation. Chatbots support customers with their online shopping experience, such as providing product information, offering recommendations, and processing transactions.

Conversational AI has the ability to support customers with automatic purchases, setting up automated repeat orders, and any issues that happen during purchases. Virtual shopping assistants can personalize the customer journey, and this makes up an estimated 70% of use cases from which enterprises expect to see value in implementing AI. This helps improve the customer experience and boost conversion and retention rates.

The insightful data that is collected and analyzed by conversational AI can contribute tremendously to business strategies by displaying customer purchasing habits and obtaining feedback.

Data collection

Did you know that conversational AI can support businesses with data collection and analysis?

Data plays an important role in AI. The more high-quality data a business has, the more opportunities it has for utilizing that data for better business decisions.

Conversational AI can help businesses by collecting and learning from data from customer interactions, therefore providing important information to support strategic management and decision-making.

Moreover, businesses can use the data to improve the understanding of customer needs and detect issues in operational processes. For example, when customer expresses concern when they interact with the virtual assistant about a certain matter, conversational AI is able to collect this as sentiment data, helping to identify an issue.

Healthcare

Recent development of conversational AI has been extremely useful for the healthcare industry. Conversational AI tools are able to diagnose health conditions online only by asking patients questions about their symptoms. The tools then automatically learn from the patients' responses to gain insights into the health problems they are having without the help of a medical practitioner.

Medical scheduling also receives support from conversational AI when it comes to scheduling patients' appointments, giving information about their visits, and even managing patients' paperwork for a more streamlined process.

As we witness the rise of emotional AI, we see solutions appearing to address the mental health crisis. Researchers suggest that conversational AI "could have a mediating role in which it can engage users and patients in a conversation with restricted and well-defined purposes and goals" with regards to a therapeutic aid.

Banking and finance

It is hard to imagine dealing with banking matters without online services these days. Bank apps are so common now where customers can seek help from a customer representative or a virtual assistant without physically visiting the bank.

The current role of conversational AI in the industry of banking and finance is mainly to avoid problems and to make it easy for customers to manage their personal banking. Conversational AI in the form of a banking virtual assistant can execute many tasks including checking balances, processing transfers and transactions, changing limits, freezing accounts, and analyzing spending patterns to assist customers. Conversational AI tools in banking can also prevent fraud by their ability to detect keywords and phrases that indicate fraud thanks to Automatic Speech Recognition (ASR), and to acknowledge irregular activities that may indicate fraud.

Internet of Things (IoT) devices

IoT devices are everyday appliances that connect to the Internet – examples include mobile phones, smartphones, tablets, and smartwatches.

You might have already been familiar with smart device assistants such as Apple Siri, Amazon Alexa, Google Assistant, or voice assistant tools like Google Home and Amazon Echo for modern homes. These are examples of conversational AI devices that rely on speech recognition to interact with users.

How to start your conversational AI implementation

Step 1. Define your use case and goals:

It is important to identify your goals right from the start of your conversational AI implementation. Your goals should be clear and specific. Answering these questions might help:

- What is the problem you are aiming to solve?
- Which conversational AI technology might be the most suitable for solving that problem?
- What are your main challenges right now?
- How do you measure success? What will be your KPIs?
- What data do you already have and what additional data do you need for the implementation?
- What resources will be allocated for this project?

Clear answers for these questions will help establish your goals and business needs to prepare for the best solution for your conversational AI implementation.

Remember to use an iterative approach by breaking down your work into smaller steps. For example, to build a customer service agent, start by creating a solution that forwards customer contact information to the right person before trying to have the agent solve the problems independently.

Step 2. Evaluate your Conversational AI readiness and internal capabilities:

AI readiness means a business's capability to adopt AI and leverage AI technologies to achieve business goals. You can discover your AI readiness here.

Once you have defined your use case and goals, the next step is to assess the necessary tools needed for your business's Conversational AI implementation project.

When it comes to implementing Conversational AI, there are these few key factors:

Conversational AI experts:

Does your company already have in-house machine learning experts, IT specialists, and senior data scientists who specialize in implementing Conversational AI? It is important to note that the implementation would require both technical and commercial expertise. If there are not enough talents in your company to execute the implementation within the desired timeframe, would your budget allow outsourcing to a third party?

Data:

Data sourcing is by far the most crucial stage in AI development. How well (or not) your machine learning algorithm will perform will depend on the training data and its annotation quality. You want to avoid the unwelcome 'garbage in, garbage out' scenario.

Software development and maintenance costs:

Maintenance costs will vary depending on the solution that you go with. There are platforms that offer maintaining and serving your models and these will charge you a monthly fee. The other option is to maintain them yourself, however, that requires technical knowledge and dedicating resources to it.

When it comes to software development, the majority of the costs in any AI project are software development costs. The model work is generally less than 10% of the project. The data costs can reach up to an estimated 30% of the total budget unless you have data available internally. The rest of the cost will be software development, hardware, and maintenance costs.

Computing resources:

Computing resources will depend on the use case and solution. If you use an existing cloud solution, you will not need to manage computing resources yourself. In that case, the costs will be according to the cloud provider's pricing either hourly based usage or by processing cost.

In the case that you develop a solution using our own hardware or on a bare cloud, most language models are today trained on GPUs and inference can be run on CPUs. New models like OpenAI's models cost per API call.

Employee training:

In case you already collaborate with a partner who is experienced in Conversational AI development, there might still be the need to train your employees on the newly implemented technology in order to ensure efficient performance.

Step 3. Prepare your data:

What training data do you need for your Conversational AI project? Start by defining your process for getting the necessary data. Continue with the iterative approach and divide this process into smaller steps:

- Decide on what your datasets should look like in terms of type and quantity. For example, is it speech data you require? Do you need thousands or millions of voice recordings to achieve the desired result? Start small, see how it goes, learn from it and adjust your data requirements.

- Once you have determined your data needs, find a data partner. Make sure to agree they can provide data that matches your use case and decide on specifics such as data project management, how and when the data will be delivered, etc. before you negotiate and finalize the deal.
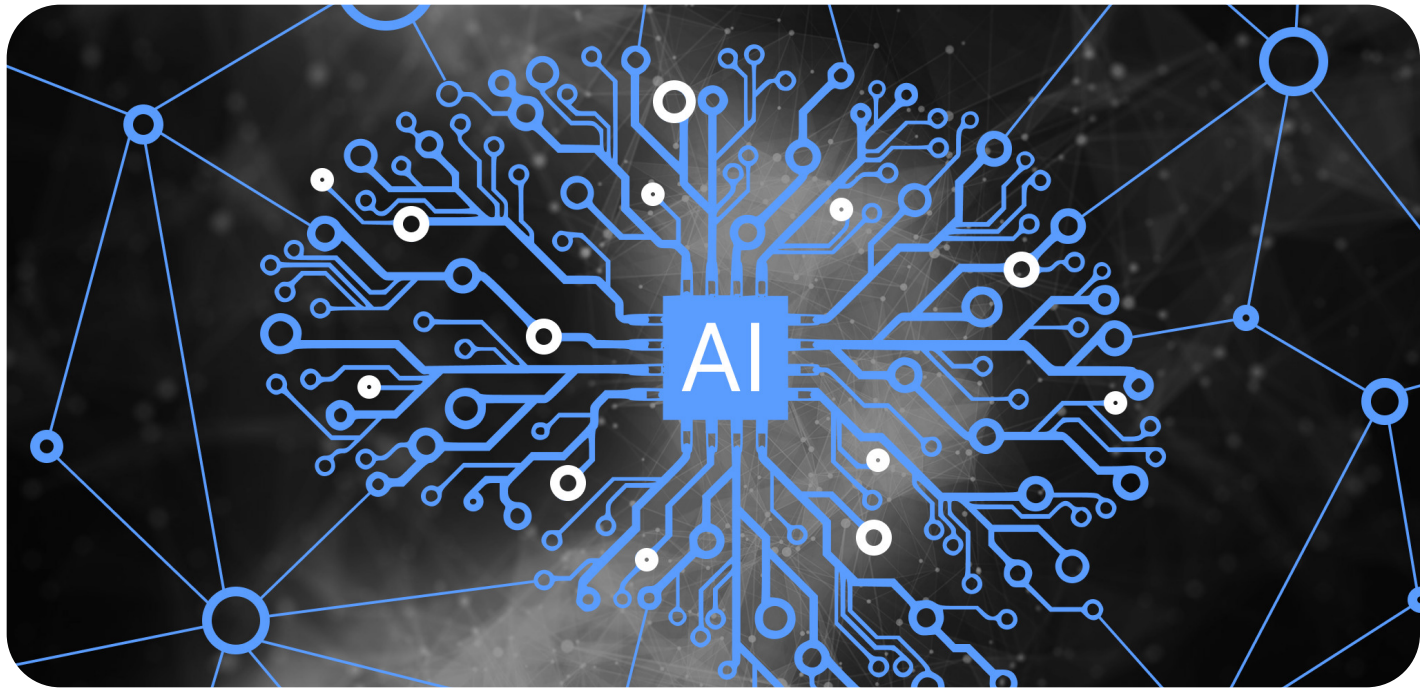
Step 4. Build and train your Conversational AI model:

Like data sourcing, AI model building and training should be a step-by-step process. Consider aspects such as:

- What technology will you use?
- Which algorithm will you be working with?
- Which platform will you choose?
- Will you build the model in-house or work with a partner?
- What is the training process going to look like?

If you've got the above figured out, define the features of your model. Unnecessary features can negatively affect accuracy, so you should only use components relevant to the model and your use case. Use tools and algorithms to help measure and remove unnecessary model features when needed.

We recommend building the first version of a system on top of existing cloud solutions and starting by fine-tuning the model to fit your use case. This will get you a working model faster and easier, however, paying for services available on Azure, AWS, or Google Cloud will cost more than running them yourself or running it on a bare cloud.

We recommend this approach as we think it is more important to get an early version of the use case up and running before optimizing the costs, as it reduces the risk and lets you focus on solving the problem rather than building related infrastructure.

Furthermore, it is easier to move one component at the time of a working system to a more optimized platform or a local solution that it is to build a solution that covers all potential needs in one iteration. We also recommend building your system using containers when possible. Docker is the most widely used solution. Containers reduce compatibility issues between hardware and make it much easier to, for example, deploy locally or switch the solution between clouds.

For easier result measuring, ensure that each model iteration is versioned and compared using the same data. When choosing the algorithm, consider if it will allow you to interpret the output without jumping through hoops. "AI model accuracy is closely connected to the quality of training data. Be specific and clearly define the steps you will take to collect data. A well-thought-out process for data sourcing can shorten your project by half a year." - Thomas Forss, Co-founder and CEO, StageZero Technologies.

Step 5. Test your Conversational AI model:

During the testing phase of AI development, you want to have some gold standard data to test against. Gold standard data is your perfect, correct dataset. Test each version of your model against this validation data to see how you are progressing and keep iterating until the model performance improves.

Edge cases, in particular, are where AI models struggle. Edge cases are rare happenings for which no data in the training dataset exists, such as, for example, a bird covering the license plate just as a truck drive past the gate. You will need to add more data to resolve such cases, and these cases will be hard to imagine before the product is live, which is why iterative development is recommended.

In speech recognition, one of the most common reasons models underperform is forgetting to include voice data with different accents. If a model is only trained with British English natives, it may not work when someone is speaking English but with a Spanish accent.

What accuracy should you aim for? It will depend on your use case. If we take a chatbot, 70% accuracy may be enough, but if it is a self-driving car - you want to aim for 100% for obvious reasons. The main goal of testing is to prepare the model for deployment and see that it can make business sense.

Step 6. Ensure you are ready for deployment:

As you prepare your AI model for deployment, consider the most efficient way to do so. Some projects might face regulatory issues. For example, because medical records in Finland cannot be processed elsewhere, a healthcare project may have to accommodate this.

In most cases, you can use a cloud provider to deploy your AI model, and different loud providers have servers located in different regions. If regulation requires you to host servers in a certain region, first check which cloud provider to use before starting the project. But if the project is large-scale, it might make sense to build your own server infrastructure or use a bare cloud solution and build your setup on top. There can also be examples when you might only deploy on premises with the end users: perhaps the model contains particularly sensitive company information or has no reason to be connected to the internet.

Evaluate whether you have achieved your KPIs and the goal of the AI project. If set parameters are not met, adjust/replace the model, or improve the quality/quantity of the training data. Upon meeting all defined parameters, deploy the model into the intended setup.

Step 7. Monitor and adjust for optimal results:

Set up a monitoring system to ensure your model is working as intended. A continuous model iteration is needed to respond to technology, business, or data changes. Regularly test output against the gold standard data and update the model with new data to ensure it still fits the use case.

If you have developed your models in containers as recommender, it will be easier to monitor and make sure that the models are reaching the required uptime. Expect your machine learning models to crash or go down from time-to-time. You can use solutions like Docker Swarm or Kubernetes to monitor and maintain uptime of your models.

Additionally, expect that the model will behave differently when deployed in the real world and the performance may vary over time depending on the use case. Pay close attention to irregular decisions or deviations from the pre-defined accuracy of the model. When the model fails above your set threshold or does not adhere to the set parameters, make necessary adjustments and fine-tune for optimal results using new data.

What's next?

If you have decided on the use case, StageZero Technologies can help you with the next step - from data sourcing to analytics and integrations.

- We offer an entire library of pre-collected and custom speech datasets, found here.
- We provide speech analytics that can be used in, for example customer service to automate calls or to extract information, found here.

If you are still trying to figure out what you need, reach out to us, and we will help you assess the solution that would work best for your project.

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