A guide to using Artificial Intelligence powered chatbots to reduce customer service costs, improve customer engagement and drive sales.
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INTRODUCTION

Chatbots, bots, virtual assistants, conversational interfaces are becoming increasingly important tools, for providing new ways to interact with technology.

As chatbots have become more powerful this has enabled them to take on more complex roles. Chatbots are the present and future of customer service and engagement. They provide an effective tool for businesses to handle customer enquiries 24/7, improve customer experience and drive sales.

This guide aims to help you learn about chatbots, what they are and how they can help as well as some useful tips on planning your own chatbot. After reading this you should have the information you need to choose an intelligent chatbot to deliver a personalised experience adding value to your business.
Chapter 1

What is a chatbot

A chatbot is a service, powered by natural language processing rules and artificial intelligence (AI), that you interact with via a voice or text-based chat interface. AI technology is used to enable the service to respond to specific user interaction. For example, a user could ask a chatbot a question or give it an instruction, and the bot could respond or perform an action as appropriate.

This chat service can take on any number of roles, providing answers, collecting customer information, suggesting products and making sales. They can live in any major chat product (Facebook Messenger, Skype, SMS, Slack, Telegram, Viber, Twitter). They can also be deployed into voice enabled assistants such as Amazon Echo or as part of a website. Chatbots can also be developed to include multiple language capability.

Conversational interfaces such as chatbots are considered the future of customer engagement. Chatbots provide a convenient, interactive way to connect with customers online and give them a similar experience to conversing with a live agent. Chatbots are an automated solution so they can provide customer support 24/7 as they have instant access to a broad array of information and functionality.

A chatbot is only as good as it’s training information. Often the real challenge is training the bot correctly so that the natural language technology can effectively support the range of questions that someone might ask. Designing the conversational workflow correctly is usually key to a chatbot’s success.
WHERE ARE WE TODAY

You will probably have heard a lot about chatbots in 2017 and this does not look like changing in 2018 and beyond. Gartner has predicted that 85% of the relationships between customers and a company will be managed without a human by 2020.

Businesses and customers have shown that bots can be a valuable tool when created thoughtfully and implemented in situations where they can be successful and provide an improvement to customer service and experience whilst reducing costs.

AI TECHNOLOGY ADVANCEMENTS

There have been considerable technological advancements in artificial intelligence technology driving the adoption of chatbots.

The improvement in Chatbot capabilities has been catalyzed by breakthroughs in an area known as machine learning. It involves “training” computers to perform tasks based on examples, rather than by relying on programming by a human. A technique called deep learning has made this approach much more powerful.

"More and more companies are using chatbots to provide an additional service to their customers."

The rate of acceleration is already astounding. After a couple of AI winters and periods of false hope over the past four decades, rapid advances in data storage and computer processing power have dramatically changed the game in recent years.

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2. www.wired.com/story/guide-artificial-intelligence
THE HISTORY OF CHATBOTS

While chatbots are at the forefront of new communication, they’re not necessarily new and have been around in various guises for a number of years. The history of chatbots go back to the earliest days of the computer, when the desire for artificial intelligence technology and a conversational interface first began.

The first chatbot ever was developed by MIT professor Joseph Weizenbaum in the 1966. It was called ELIZA and mimicked human conversation. Since then there have been a number of notable bots:

- 1988 Jabberwacky, was one of the earliest attempts at using AI to create a conversational chatbot.
- 1995 A.L.I.C.E, was a natural language processing bot.
- 2001 Smarterchild, an intelligent bot widely distributed across SMS networks.
- 2006 IBM’s Watson.
- 2010 Siri: an intelligent personal assistant, part of Apple’s iOS.
- 2012 Google now, developed for the Google search mobile app.
- 2015 Alexa: a voice service implemented in the Amazon Echo device.
- 2015 Cortana: intelligent assistant created by Microsoft.
- 2016 Facebook Messenger: allowing developers to create chatbots.
THE RISE OF MESSAGING

Whilst artificial intelligence technology is rapidly developing and improving chatbot capabilities we have also seen a rise in mobile messaging.

People are spending more and more time in messaging apps. The number of monthly active users of the top 4 messaging apps (Messenger, WhatsApp, WeChat and Viber) surpassed the number of monthly active users of the top 4 social networks (Facebook, Twitter, Instagram und Google+) for the first time in 2015.

Studies have shown that **over 51% of consumers would prefer businesses to offer their services 24/7, 45.8% would rather use messaging instead of email when it comes to contacting businesses and 49.4% would take messaging over calls.**

These messaging platforms have provided the perfect platform to implement chatbots so users can interact with them from inside their favourite messaging platform. According to BI Intelligence survey data, **Chatbots adoption has already taken off in the US** with more than half of users between the ages of 18 and 55 having used them.

Chatbots deployed in these ways are able to engage with users, providing an easy and convenient channel for advertising directly through the messenger interface.

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4https://venturebeat.com/2016/08/26/3-stats-that-show-chatbots-are-here-to-stay/
HOW DO THEY WORK

To help you understand chatbots it’s useful to have some understanding of how they work without going too deep in to technical details. One widely used term for a chatbot is conversational User Interface (CUI). A chatbot works in the same way as a human operator. It’s essentially an interface to carry out a task via a text or voice based conversation. When a customer opens a chat dialogue or speaks to a voice interface then the chatbot responds.

For example: If a customer types the question "can you suggest this seasons latest trends" then the chatbot will immediately respond with the correct information: "sure, I can tell you about Spring trends this year, but first I’m just going to ask a couple of questions to narrow my suggestions down, is that ok?".

A chatbot can leverage Artificial Intelligence to a greater and lessor degree. Some rely on hard-coded structured questions and answers and can become limited if a user strays from what is known as the 'happy path', in short they are only able to answer the questions they have been programmed to answer. Other chatbots rely more heavily on machine learning algorithms and can learn appropriate answers to specific user queries so that they can be trained to handle more question variations. This means that they are still able to understand a question worded differently to provide a valid response. For example: "tell me what’s on trend this season?", "what is going to be hot this season" and "what are the trends for summer this year?" would all be handled correctly as the chatbot understands they are being asked for advice on fashion for a specific season.

The principles of NLP6: Intent, contexts, entity and utterance are beyond the scope of this document. But explained briefly intents and entities help structure the chatbot contexts to handle conversational flow whilst utterances allow us to train the chatbot, essentially making it become smarter. Text-based chatbots can often support a combination of text and User Interface (UI) elements depending on the platform the bot is deployed on for example the Facebook Messenger Platform.

WHERE DO THEY WORK

Chatbots have been deployed in many different guises as they are extremely flexible and able to take on whatever business need arises. The possibilities are endless, here are some examples:

**CELEBRITY**
www.m.me/katyperry
Katy Perry's official Facebook Messenger bot.

**CUSTOMER SERVICE**
Vodafone TOBi
Vodafone's customer service chatbot is based on IBM's Watson & provides a fully integrated webchat for customers.

**PRODUCTIVITY**
https://slack.com/apps/A0GRU84TF-ace
AceBot a productivity tool with expense tracking & intelligent task management, deployed in Slack.

**INFORMATION**
www.m.me/hiponcho
Poncho The Weather Cat, a simpler weather service with a personality, delivered to you every day.

**E-COMMERCE**
www.m.me/LEGO
The official Lego Facebook Messenger bot. Ready to help your next LEGO purchase.

**HEALTH**
www.m.me/superizzyai
Izzy is a period tracking and pill reminder chatbot.
CHAPTER 2

WHY YOUR BUSINESS NEEDS A CHATBOT

We have already mentioned that chatbots are used for supporting customer service teams in their communications with customers. Providing accessible information 24/7 saves businesses money and time. By 2022 chatbots are expected to save $8 billion.7

Other benefits can be seen in customer service gains. According to Jon Davies, head of digital at Vodafone, their customer service chatbot, TOBI provides "a far more engaging and personal" customer experience, as well as improving completion rates and reducing transaction times. These types of successes are highlighted in improved net promoter scores (NPS).

They can also be used as an effective marketing tool. Substituting emails with push notifications which obtain much higher click through rates. Chatbots can be used to send users personalised tips, greetings and information, generating leads and forging stronger customer relationships.

Businesses are finding chatbots to be a great tool to engage with their market: "Our target customers are early adopters of social innovation so a chatbot is the perfect vehicle for us to communicate with them", Sarah Gower, Adidas.9

The business landscape is evolving faster and faster, so what can a chatbot provide to help you remain competitive.

**FAMILIAR TECHNOLOGY**

These days customers are savvier and demand an intuitive and seamless customer experience, using technology to fit in with their communication habits. Many prefer social media and mobile platforms for communication and expect businesses to be on-line when they are. If users are having a conversation with a chatbot in Facebook Messenger, they are using a conversation channel they are familiar with and they are already using the technology and don't need to install a new app. The numbers of messenger app users has been steadily rising. As of April 2017 Facebook Messenger had 1.2 billion monthly active users worldwide.¹⁰

It’s also important to note that 2 out of 3 customers actually prefer to message a business to submit an enquiry²¹ rather than use other more traditional channels such as email or phone. Every day 1.4 billion people around the world send over 50 billion messages to communicate with each other. As messaging becomes even more central in people’s lives, demand for service in messaging has continued to rise.²²

¹⁰https://techcrunch.com/2017/04/12/messenger/
²²https://www.wired.com/2016/01/why-facebook-messenger-for-businesses-is-about-to-kill-it/
IMPROVED COMMUNICATION

A chatbot can enter into personalized and automated communication with your customers.

Using push notifications to send new product recommendations and offers or gaining valuable feedback from harvesting reviews. A chatbot can be an ideal tool to broadcast information to customers. Opt-in targeted messages or push notifications have 90% read rates and a 40% click through rate.

Using these techniques a chatbot is able to reach participants wherever they are, regardless of where the chat session was initiated, whether on a mobile app, a website and even from social platforms such as Facebook Messenger.

In customer or technical support a chatbot can also be programmed to respond to users requests to speak to human operators or even be smart enough to hand over when an escalation is needed. This ensures that users are always able to converse with real people if needed, ensuring the optimal customer experience.
MULTI LANGUAGE CUSTOMER SUPPORT 24/7

For businesses the biggest challenge to serving your customers in several communication channels is responding quickly. Although a chatbot cannot handle all customer queries, it can be used to deal with a large number of the routine business enquiries which most companies deal with on a day to day basis.

One of the great benefits of a chatbot is the constant availability. Customer expectations are high expecting a quick response to enquiries. With a chatbot you can offer your customers a service which is available 24 hours a day even when there are no employees in the office. You can rely on your bot no matter what time of the day or day of the week or timezone the enquiry is coming from.

Chatbots can be enabled to understand multiple languages. NLP technology will understand queries in different languages and respond appropriately.

Chatbots are scalable and capable of handling multiple enquiries, ready to step up when enquiry demands are at their peak.

A well implemented and executed chatbot can give organisers the ability to have more conversations and help more people at once than other alternatives, for example live chat applications on websites. This ability to handle the frequent enquires where the responses are often similar facilitates businesses in freeing up staff to deal with the more complex issues. To avoid frustration, a chatbot can be developed to use a "sentiment" function to pass users onto a real advisor if the bot can’t help or if they are not satisfied.
DATA INTEGRATION

With the correct integration development a chatbot is able to answer complex enquiries by integrating with existing business systems easily.

Chatbots can handle transactions, provide technical support, authorise refunds or check details.

Connect your chatbot seamlessly with your entire business ecosystem - CRM, ERP, CMS, and other business critical applications.
CHAPTER 3

PLANNING YOUR CHATBOT

For many companies the question is no longer "whether they should have a chatbot" but rather how are you going to build yours?
Now that you have an overall understanding about what chatbots are and what they are capable of, let's look at some tips to planning your own chatbot and what you need to consider to ensure your planning and launch is a success.

SOME THINGS TO CONSIDER

1. **What is the purpose of your chatbot?**
   Why do you want to create a chatbot? What do you want the chatbot to do for your business and how will it achieve your business goals?
   
   Right from the beginning of the project, it's important for yourself and team to have a clear understanding about what your chatbot will do.

2. **What are the key goals of your chatbot?**
   What are the main aims of your chatbot?
   It could be to drive sales, provide 24/7 customer support or engage with new and existing customers by gathering customer feedback and delivering new product information.
3. **How will you measure your chatbot's success?**
   How will you determine the success of your chatbot? What will your Key Performance Indicators (KPI) be?

   For example, you could look at click-through rates, the numbers of enquiries handled correctly, or feedback statistics gathered.

4. **Who is going to use your chatbot?**
   Have a clear idea about who is going to use your chatbot, what will be the user demographic? This may influence your chatbot's persona.

5. **Where will your chatbot be deployed?**
   Your audience should drive your chatbot platform choice if possible. If you can collect information on which messenger platforms your audience use, then this should assist your decision. Now is also a good time to consider voice platforms such as Alexa or Google Home.

   With over 1 billion active users, Facebook Messenger is our favourite messaging platform.

6. **What will your chatbot do?**
   Here, you can really start to consider what sort of functionality the chatbot needs to provide and most importantly, the conversations it will be able to support.

   A good way to capture chatbot requirements is by looking at them as user stories. The story is in the same format:
   **As a , I want , so that:** for example:
   - I'm a participant, I want to check what time I can start my event, so that I can be ready to leave in good time.
   - As a business, I want to collect customer reviews, so that I can improve their experience.
   - As a customer, I want to access my account details quickly and receive an account update through my personal assistant.
7. **Will the chatbot have a character?**
   Will the chatbot have its own persona, will it have a character?

   Is the chatbot going to just be a polite assistant or does it need a character to carry through your brand.

8. **How will the chatbot create value?**
   Think about the overall chatbot experience for users. How will the chatbot ensure that users come back?

   For example by providing a simple and well executed personal assistant then customers are going to use this as their first port of call to find information and/or contact your company.

9. **How will people find the chatbot?**
   How are you going to drive people to find and use your chatbot?

   Links on your website and also advertising on Facebook can be great places to start as well as content on your Facebook page.

10. **How will you look after your bot?**
    How will you monitor the chatbots performance after its launch? In comparison to other projects, its important to note that once the chatbot is launched this is just the start of your journey. Essentially you are at the start of the optimization phase. You will need to provide resources to get the most out of your chatbot after it’s launch.

    You will need to monitor user interactions, reactions, unanswered requests so you can train your chatbot and improve overall user experience, training your chatbot is key!
TIPS FOR A SUCCESSFUL CHATBOT

Here are some tips to help ensure your chatbot project is successful.

1. Find the right use case
   Ensure you have considered your chatbots use case carefully. It's often best to start with one single topic that your chatbot should handle and try and go as deep as possible. This enables the chatbot to answer a lot of related questions so it is better that your chatbot development starts with one or two topics.

2. Plan your dialogue carefully
   Planning conversational dialogue takes skill and experience. The conversations we have can be unpredictable. Your chatbot needs to handle: Alternative choice questions, Who, what, where, when, why questions, Yes or no questions and small talk. It’s also best to steer clear of rhetorical questions.
   One of the real challenges is providing the data which natural language technology can leverage to support the range of questions that someone might ask, or in other words training your intents.

Using real message chat data or enquiry dialogue if available can be very useful to bootstrap the system. Having an initial 5-10 utterances for each of your planned intents is a good start.

3. Combine text and UI elements
   Utilise text and graphical interface elements. Many chat platforms including Facebook Messenger, Google Assistant and Kik allow web views on which developers can create completely customized graphical interfaces. Leverage these elements when harvesting user data, notification enrolment options, highlighting product details or using buttons to aid in conversational flow.

4. Provide help
   Providing an easy way for users to access chatbot help is key to providing a positive experience. This should be provided at the onboarding step where you also set expectations for your users and communicate your main functionality.
5. **Conversational skills**  
Explain the scope of your chatbot's capabilities, what they can do and how they can help. Although it's always wise to let the user know they are not conversing with a human try and use human language and techniques. Use emojis, keep your messages short and clear and use full words and common human language. Handle errors gracefully, if your conversation gets off track, ensure that a user is led back into normal conversational flow.

6. **Provide seamless integration with human agents**  
A chatbot should have the capability to work with human agents, either by seamlessly escalating to live chat or handing over messages to human agents.

7. **Engage with customers**  
Leverage push notifications to engage with your users.

8. **Consider integration capability**  
It's always important to keep in mind other use cases. What else can you achieve with your chatbot? Your chatbot's functionality can be easily expanded by developing integrations with existing systems.

9. **Tell people about your bot**  
It's often a good idea to advertise the existence of your chatbot. If you do not advertise, it may not be used to its full potential. Notify customers by email about the existence and purpose of the chatbot. Use the chatbot as a notification tool. Use your Facebook page and website to point people to your shiny new chatbot.

10. **Test, test and more test**  
Train, talk to your bot, train again. First Impressions matter so testing your bot in the real world is essential. Plan to have a test roll-out to a closed group. Ask as many test users as possible to have conversations with the chatbot, before you launch.  
This training data of last comments and failed responses is used to tune your matrix of keywords and phrases.

11. **Maintain and Iterate**  
Once live your chatbot needs maintenance and training to ensure it keeps on performing to its maximum potential. It's also important to keep the chatbot information up to date.  
Your chatbot development should be an iterative ongoing process that develops organically inline with the businesses' commercial goals and marketing strategy.
CONCLUSION

An effective Chatbot can distinguish your brand, enhance relationships with current customers and open new channels to fresh customers.

Now is the time to start thinking about your own chatbot.

Building a chatbot can mean investing in the technology and time, so it’s up to you where you want to go with your chatbot. There are many out of the box chatbot solutions on the market but these have often fallen short and provide a bad user experience. Unfortunately there are thousands of chatbots which have not had the time and money invested in them and so have not gained the desired results. Facebook Messenger chatbots showed a 70% failure rate in 2017. No code solutions can be good for simple scripted bots, but they are often sold as something bigger.

To create a chatbot which creates extraordinary value and experience, the required budget is needed. To really maximise functionality and integration, chatbots need to be customized in ways that can only be achieved with code and need to leverage strong NLP, NLU and ML technology.

Ultimately when considering a chatbot for your business you need to consider what you really want to achieve. Custom solutions which are built on streamlined, well designed and tested conversational functionality but are still flexible enough to add the features you require are often the ideal solution.


The Bot Forge are chatbot developers and AI specialists with 20 years coding experience.

We provide chatbot and AI consulting and development services.

We leverage and build on top of market leading technologies to make chatbots that can be used on your Website, Messenger App or Voice-enabled platform.

www.thebotforge.io
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APPENDICES

CHATBOT TERMS CHEAT-SHEET

You may well come across a number of different terms and vocabulary related to chatbots and artificial intelligence, some of which have been mentioned in this document already.
But what do developers and technologists really mean when they use these terms? Having a simple understanding of some of the more frequently used terms can be useful when thinking about your chatbot strategy.

1. **Algorithm**
   An algorithm is a formula for completing a task. Wikipedia states that an algorithm "is a step-by-step procedure for calculations. Algorithms are used for calculating, automated processing and data processing and provide the foundations for artificial intelligence technology.

2. **Artificial Neural Network**
   Artificial Neural Networks or ANN are artificial replicas of the biological networks in our brain and are a type of machine learning. Although nowhere near as powerful as our own brains they can still perform complex tasks such as playing chess, for example AlphaZero, the game playing AI created by Google.

3. **Artificial Intelligence**
   AI research and development aims to enable computers to make decisions and solve problems. The term is actually a field of computer science and is used to describe any part of AI technology of which there are 3 main distinctions 14

4. **Autonomous**
   Autonomy is the ability to act independently so software which can complete tasks on its own is autonomous for example systems which manage self driving cars.

5. **Chatbots**
   I think we have mentioned these once or twice! A chatbot is a conversational interface powered by AI. They can be text based, living in apps such as Facebook Messenger or their interface can use voice enabled technology such as Amazon Alexa or Google Assistant.

14https://venturebeat.com/2017/05/21/3-types-of-artificial-intelligence-but-only-2-are-valid/
6. Cognitive
Cognitive computing mimics the way the human brain thinks by making use of machine learning techniques. As researchers move closer towards transformative artificial intelligence, cognitive will become increasingly relevant.

7. Deep Learning
Also known as a deep neural network, deep learning uses algorithms to understand data and datasets. Deep Learning is a sub field of machine learning concerned with algorithms inspired by the structure and function of the brain called artificial neural networks.

8. Entity
Entities are also sometimes referred to as slots. An entity is used for extracting parameter values from natural language inputs. Any important data you want to get from a user’s request, will have a corresponding entity. For example if asked for your favourite colour you would reply “my favourite colour is red” so red would be picked up by a colour entity.

9. Machine Learning
Probably used by you every day in Google search for example or Facebook’s image recognition. Machine learning allows software packages to be more accurate in predicting an outcome without being explicitly programmed. Machine learning algorithms take input data and use statistical analysis to predict an outcome within a given range. Machine learning methods include pattern recognition, natural language processing and data mining.

10. Natural Language Processing
Natural language processing (NLP) enables machines to understand human language. Machine learning is used to find patterns within large sets of language data sets in order to recognise natural language and aid machines in understanding sentiment so that they can respond correctly.

11. Utterance
An utterance is anything the user says. For example, if a user types “what is my favourite colour”, the entire sentence is the utterance.

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CHATBOT PROJECT CHECKLIST

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2. What are the key goals of your chatbot?
   What are the main aims of your chatbot?

3. How will you measure your chatbot’s success?
   How will you determine the success of your chatbot? What will your Key Performance Indicators (KPI) be?

4. Who is going to use your chatbot?
   Do you have a clear idea about who is going to use your chatbot?

5. Where will your chatbot be deployed?
   Your audience should drive your chatbot platform choice if possible.
6. **What will your chatbot do?**
   Consider what sort of functionality the chatbot needs to provide and most importantly the conversations it will be able to support.

7. **Will the chatbot have a character?**
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