

**TOPIC : CHATBOT**

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# Chatbot

## For your business

Lorem ipsum dolor sit amet, consectetur elit. Etiam rhoncus, velit vel lacinia commodo molestie metus, a dignissim sem purus

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# Introduction

A chatbot (conversational interface, AI agent) is a computer program that can understand human language and converse with a user via a website or a messaging app. Chatbots can handle various tasks online — from answering simple questions and scheduling calls to gathering customer feedback.

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**“By 2020, the average person will have more conversations a day with bots than they do with their spouse”**

L. HEATHER PEMBERTON | GARTNER



# Value throughout your organization

Chatbots are key in your organization's digital journey and in delivering next generation intelligent customer service.



# What is a Chatbot?

Chatbots offer a conversational experience using artificial intelligence and natural language processing to mimic conversations with real people.



## **Intelligent**

Advanced software learns from past interactions, improving responses over time



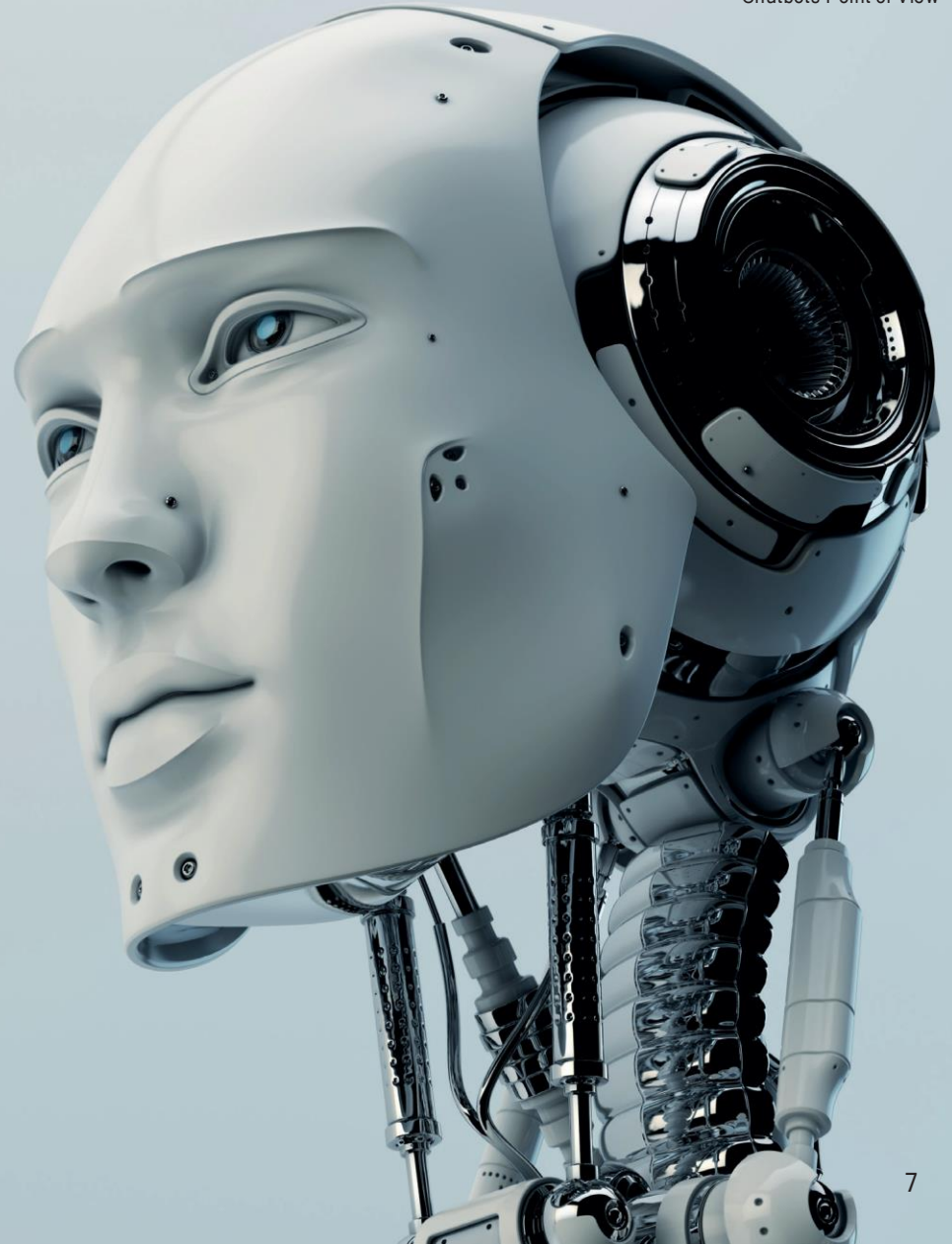
## **Effective**

Let users perform tasks efficiently and accurately through conversational self-service



## **Engaging**

Enables human-like interaction delivered through a channel that is easily scalable



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## Rise of the Chatbot



# Computer power driving Enterprise Intelligence

Systems have evolved from mechanical computation & tabulation devices to intelligent systems that can emulate human cognition.

1900s

## Tabulating system era

Mechanical devices assisted in organizing data and e.g. making calculations for employee sales performances evaluation purposes. Ex. Hollerith Tabulating Machine.

1950s

## Programmable system era

Programmable systems enabled Space Exploration and the development of the internet. This era will continue indefinitely, and will underpin the era of computing that we are in now. E.g. Windows Desktops / ERP Systems.

2010s

## Cognitive era systems

Cognitive systems are computer systems that have capabilities to emulate the human brain. Ex. Self-driving cars, Chatbots, Virtual Agents...

2020s

## Amplified Intelligence

Future systems will be able to mimic human intelligence and entirely replicate human interactions.

### Welcome to the Cognitive Era!

**Big data technologies** in conjunction with **cognitive computing** enable us to extract insight from data that was previously unused.

### Key drivers



Exponential growth of Data



Smarter algorithms



Faster processing speed

# Market forces driving Chatbot opportunities

Developments at both the side of supply and demand drive the added value of Chatbot technology.

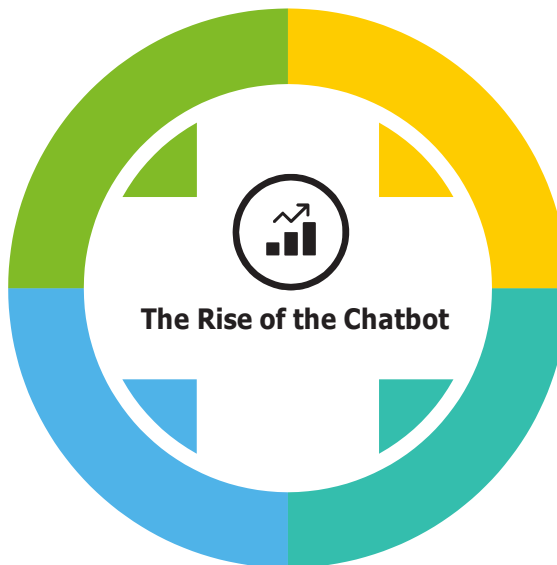
## Demand

### Increasing pressure on contact centers

High turnover rates, increased need for training and the necessity for reducing operating cost are putting pressure on the traditional contact center.

### Rising demand for self-service

Customers are demanding self-service. No longer are they prepared to wait weeks, days, hours or even minutes for an employee to help them. They need their problem fixed and they need it fixed now!



## Supply

### Technological advances in AI and NLP

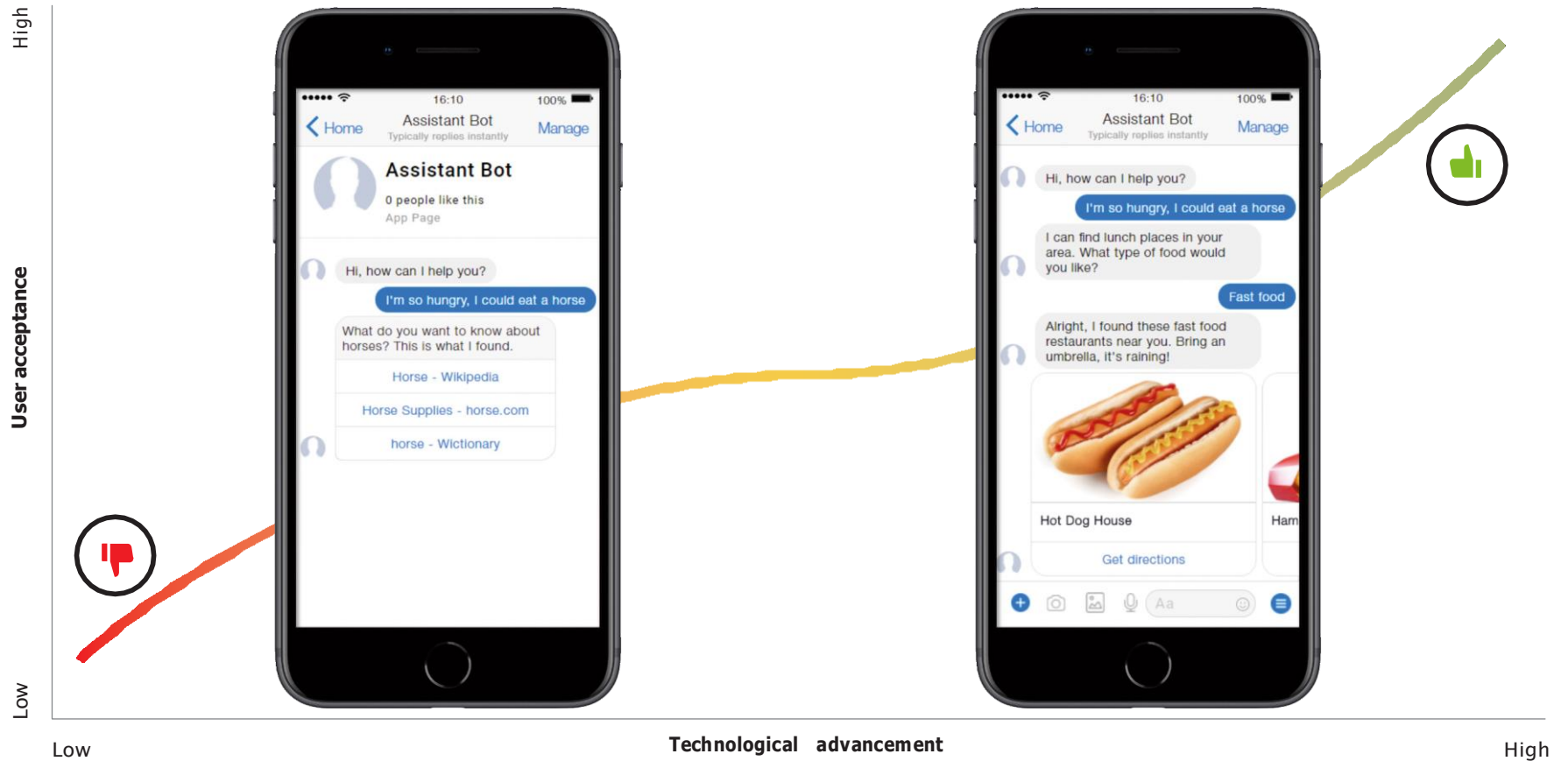
Chatbots are going beyond keyword matching. Advancements in Natural Language Processing, processing speed, machine learning models and data availability have made this possible.

### Chatbot platforms maturing

As Chatbot technology becomes more popular, their development platforms become more mature. They come with easy to grasp drag-and-drop interfaces, allowing business users to build and manage Chatbots themselves.

# Towards user acceptance

Due to improvements in Natural Language Processing, Chatbots are shifting from command-driven towards more intelligent, conversational driven 'Virtual Assistants', which are much better at determining context and user intent.



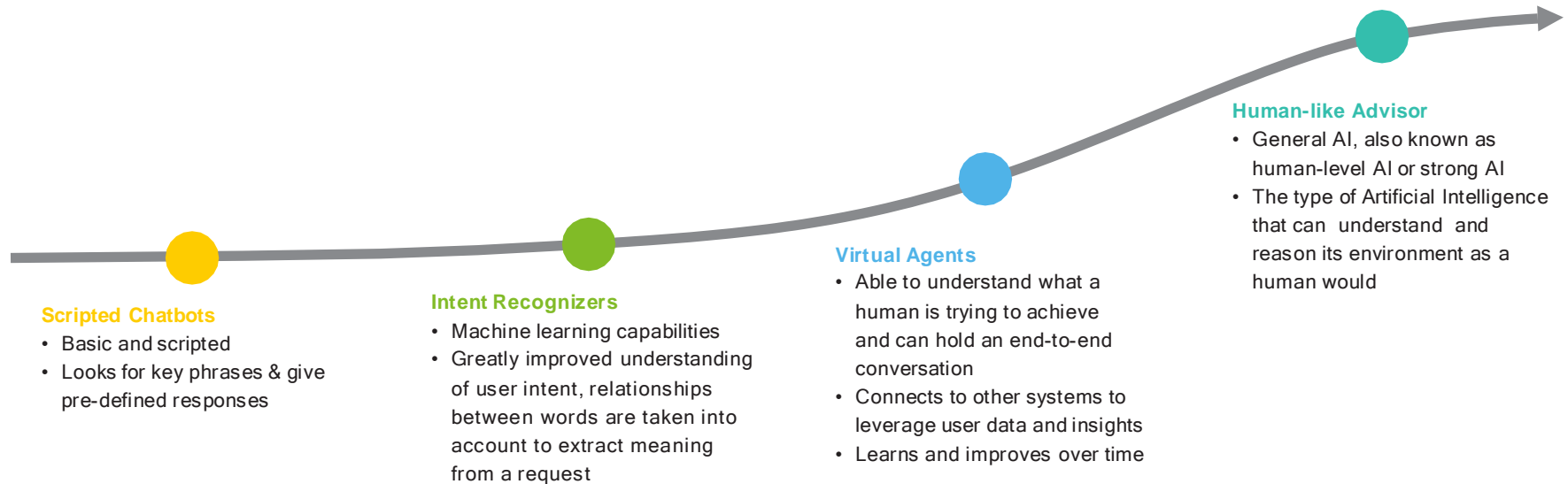
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## Chatbot Types

# Evolution of Conversational AI

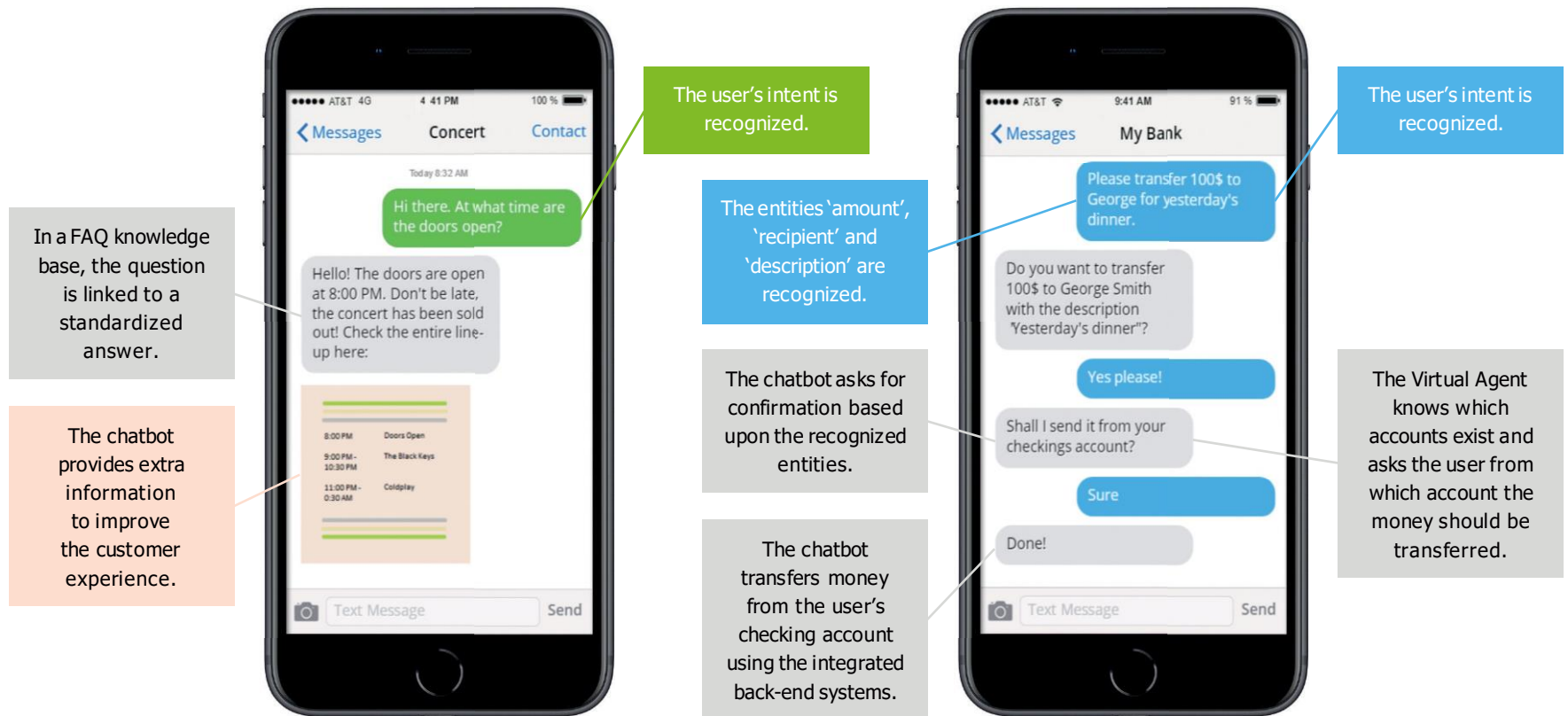
Chatbots are like apps that users interact with in a conversational way, through text or speech. As technology advances, Chatbots are able to better understand both written and spoken text.

A Chatbot may be as **simple as basic pattern matching** with a response, or it may be a sophisticated weaving of **artificial intelligence techniques** with complex conversational state tracking and **integration into existing business services**.



# Chatbots have different levels of intelligence...

There is no clear separation between Chatbots and Virtual agents, as they operate within a large range of complexity in both dialog and processes. Both sides of the spectrum have valuable applications. Below are two examples of applications of different complexity and intelligence.



# ...and there is a large range of valuable solutions

Chatbots come in various degrees of intelligence and range from answering questions to having the full capabilities of a service employee. The right level of intelligence should be picked depending on the use case.

## FAQ Chatbot

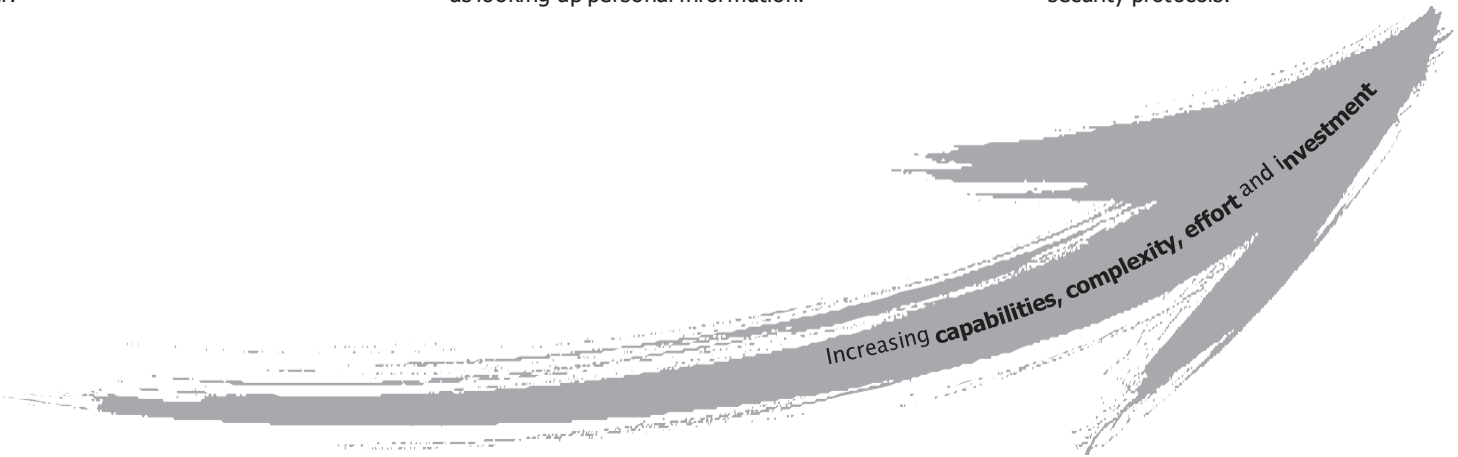
FAQ Chatbots are perhaps the most simple form of a Chatbot, which can already bring plenty of value. It can understand questions and gives the user the most relevant answer.

## Virtual Assistant

With slightly higher intelligence we find the Virtual Assistant, which has more integration with enterprise systems and therefore can perform basic actions, such as looking up personal information.

## Virtual Agent

The most intelligent Chatbots are Virtual Agents, which can completely replace an employee. These bots can handle the most complex dialogs, processes and security protocols.



Increasing capabilities, complexity, effort and investment

Self-learning Chatbots placed on a webpage can decrease the amount of phone calls to a service desk dramatically answering the most frequently asked questions.

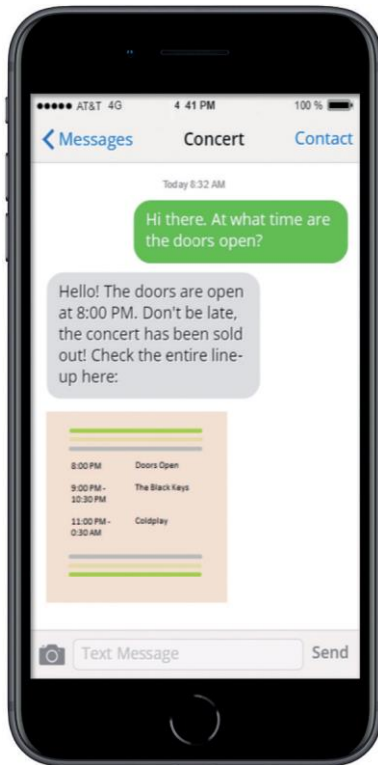
Virtual Assistants decrease service desk workload by, for example, looking up vacation days of an employee, or enabling an employee to buy vacation days through the Chatbot.

Virtual Agents can handle complex processes, such as walking a client through making a bank transfer or making changes to their personal information, effectively replacing an employee.

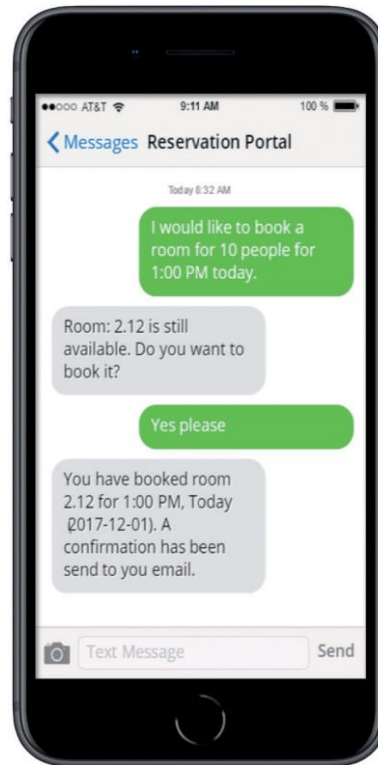


# Chatbot applications

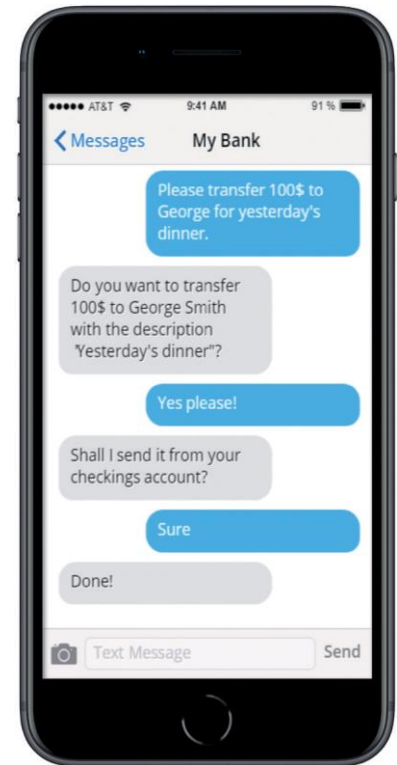
Chatbots have a broad range of applications; they help users with information requests, reservations or personalized tasks like money transfer.



You are in a hurry to catch a train to bring you to the concert of your favorite band. Quickly check if you are going to make it!



You have just heard about an important meeting but are not at the office. Use the Chatbot to quickly identify free rooms and book it instantly.



Instantly transfer money. Use a familiar interface to transfer money, request account information and much more...



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## Architecting a Chatbot



# Understanding Language & Context

Chatbots mimic different functions of the human brain.

## Reinforcement Learning

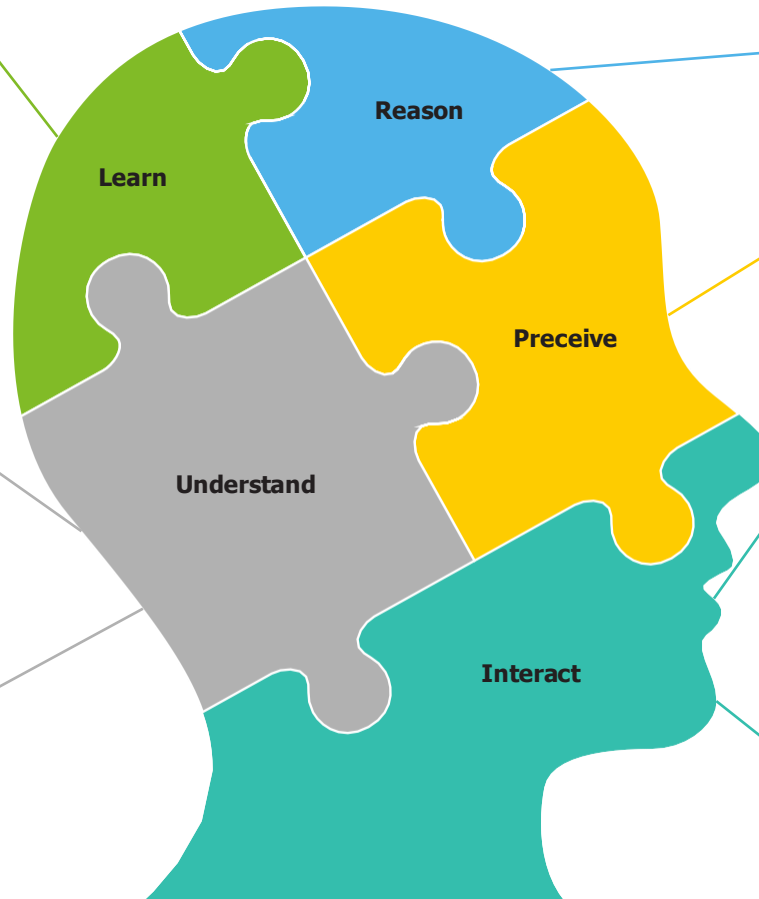
Ability to accept user “corrections” over time to improve suitability of responses. Allows the Chatbot to improve and learn off of user inputs.

## Machine Learning

Learn how to respond to the user by analyzing human agent responses. Necessary for qualitative intent recognition.

## Intent Recognition

Ability to “guess” what the user is requesting, even if phrased unexpectedly. Necessary to enable natural conversation, reduce user frustration and enable the virtual agent to start a relevant dialog.



## Natural Language Processing

Ability to “read” or parse human language text. Pre-requisite for understanding natural sentence structures vs. simple keyword “triggers”.

## Entity Recognition

Understand that some text refers to informative abstract categories (entities) such as “February 2” = Date. Necessary for more complex commands and analysis.

## Dialog Management

Ability to follow conversation history, recall and memorize over a single conversation, and across conversations. Necessary for natural, human-like back and forth conversation.

## Q&A Pairs / Scripts

Is used to deliver facts, details or solutions to queries or requests. Benefits greatly from good Intent Recognition.

# Chatbot Characteristics

There is a big variety in Chatbot development platforms. Below are a number of characteristics that should be taken into account when choosing the suitable platform to implement with your Chatbot.



## **Intent Recognition**

Ability to “guess” what the user is requesting, even if phrased unexpectedly. Good intent recognition is vital if you don’t want to annoy your users.



## **Dialog Management**

Go beyond simple Q&A and enable your Chatbot to have complex and meaningful conversations with the user.



## **Humanization**

Users get more engaged in conversation if a Chatbot acts more human-like. Some Chatbots are able to detect and show emotions.



## **Interaction Channels**

How will users interact with your Chatbot? Choose a platform that connects easily with your webchat, app, social media platform or voice interface.



## **Task Automation Capability**

Does your Chatbot need to perform tasks for users? Make sure it has enough dialog capabilities and that it can connect to your back-end systems



## **Reporting & Monitoring**

Are your customers being helped? Are they happy? Does your contact center get less calls? Choose a Chatbot platform that tells you how it’s performing.



## **Ease of Implementation**

Some platforms require custom software development, while others allow business users to configure the Chatbot themselves.



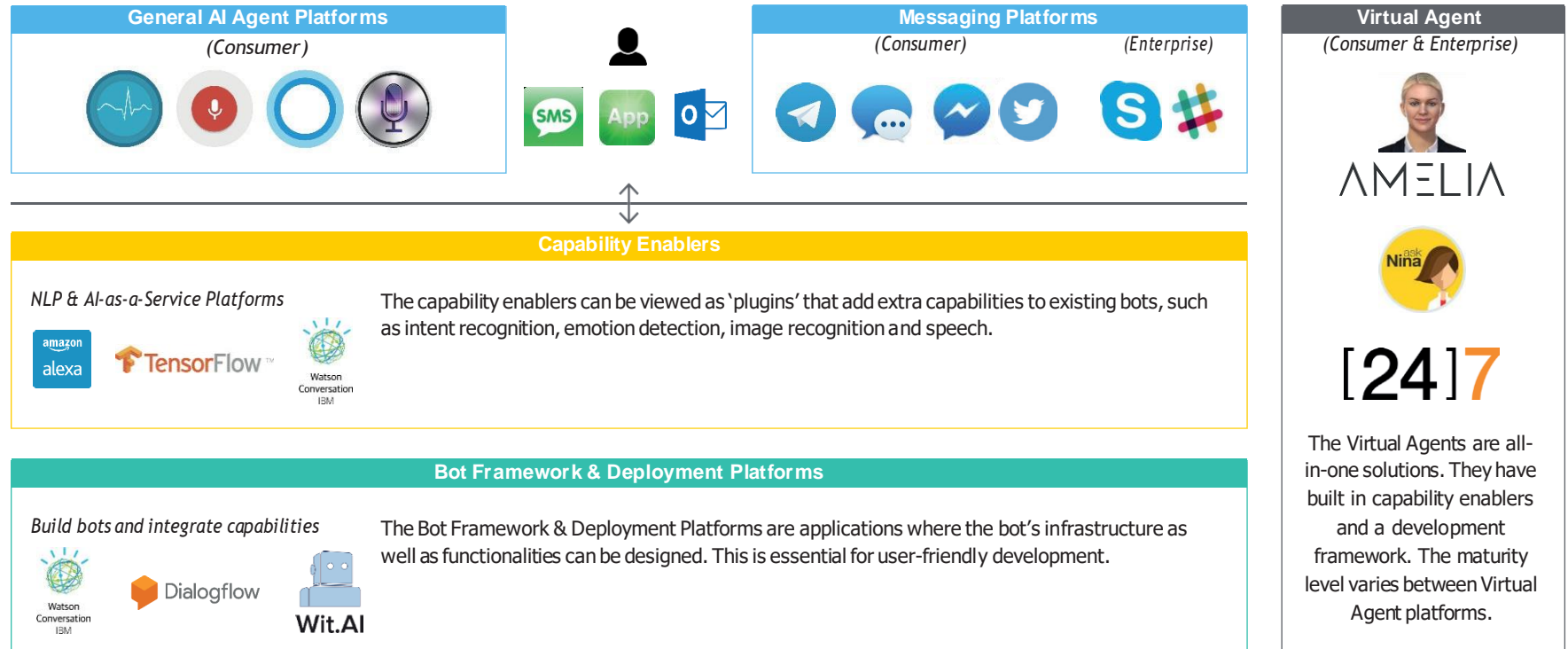
## **Security & Compliance**

Do you have extra security requirements? Or do you need to be compliant with audit regulations? Security and logging capabilities vary amongst platforms.

# Understanding the vendor landscape

Non-exhaustive

A Chatbot is often built up from different components. There is a large landscape of vendors of frameworks, capability enhancers and messaging platforms that all provide slightly different functionalities. Some vendors provide all-in-one solutions.



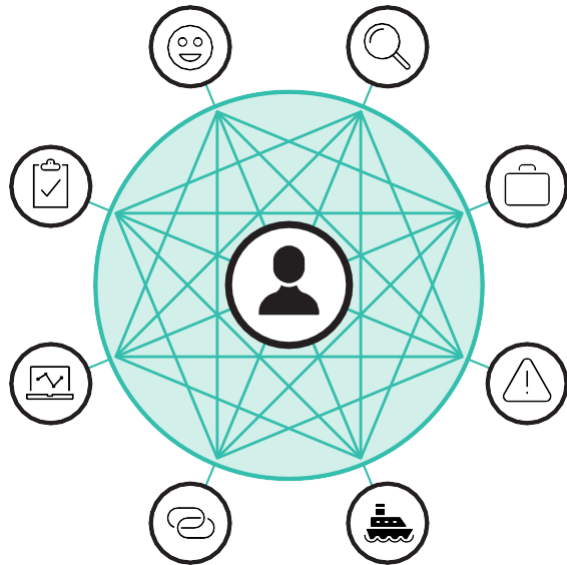










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## Our approach

# When to use? How to use?

There are a lot of aspects to consider when implementing a Chatbot. The large variety of vendors complicates this process further. It is important to find the Chatbot that fits your particular needs, which means you need to do research before implementing.

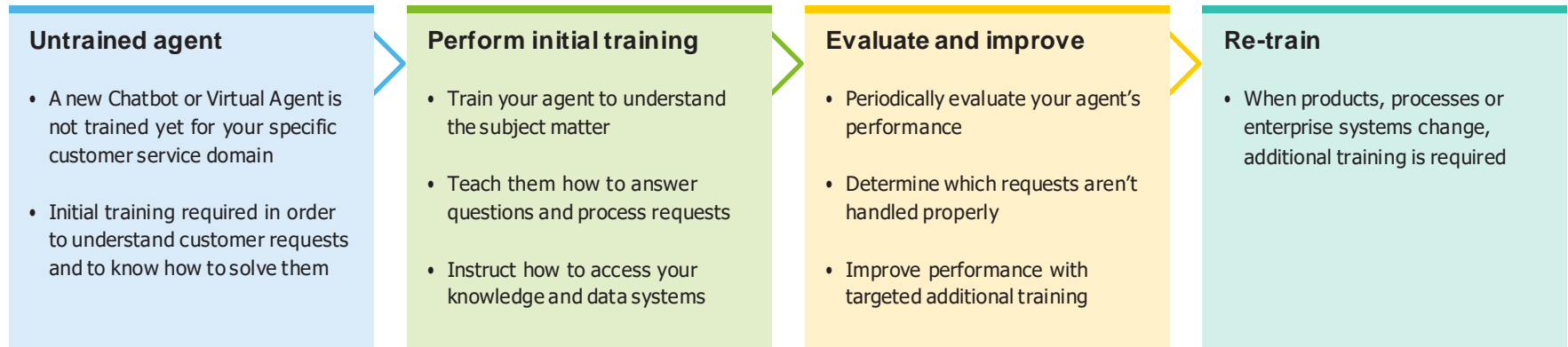


	<b>Do your research</b>	Researching Chatbots before deciding to implement one will give the highest return on your investment
	<b>Represent your organization</b>	Chatbots are often a customer facing application, so it is important that it represents your organization in a proper manner.
	<b>Fit your needs</b>	Make sure the solution fits your needs. Don't let a simple Chatbot do complex tasks, don't let a Virtual Agent do simple tasks.
	<b>It's a journey</b>	A Chatbot changes the way you interact with customers. Make sure they see the added value.
	<b>Connect</b>	A Chatbot increases in value when it is well connected to back-end systems, so that it can make changes and request information.
	<b>Augmentation</b>	Use it to make your current services smarter and increase the employee efficiency.
	<b>Easy does it</b>	Start with a MVP to prove value, and add complexity in steps.
	<b>Know your customer</b>	Find out if your customers are ready for the change. If so, what are their expectations?



# Train your chatbot

Training a Chatbot or Virtual Agent is not so different from training a human employee: it requires time and investment. Retraining is required when processes or products change.



Training many human agents with high turnover

VS

Training a single Virtual Agent



# We assist our clients all the way

Deloitte provides support in different stages of implementing a bot within your organization: all the way from the exploration phase to a fully working and integrated solution.

## Explore

- Exploring the business value and technological feasibility of applying Conversational AI.
- Understanding the vendor landscape.



## Create a Vision

- Set a vision by defining the future channel strategy & mix introducing automated chat
- (Re)design the customer journey across all touchpoints to optimize the experience



## Build an MVP

- Mobilize the right team to engage in building a Minimal Viable Product solution to start the learning experience together with all stakeholders (customers, operations, IT, organizational design, ...)



## Deloitte Accelerators & Capabilities

- Cognitive Value Assessment
- Vendor Landscape Analysis & Selection Framework
- Chatbot Prototyping Bootcamp

- Channel strategy design
- Customer journey design
- AI solution architecture expertise

- Chatbot MVP Approach
- AI Engineering Capability
- AI Solution Architecture Expertise
- UX/UI design experts





