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# Introduction

Dear Reader,

Chatbots are a clear manifestation that Artificial Intelligence (AI) is moving the hype. We see more and more business applications where chatbots with self-learning capabilities can interact with humans in a more natural way. We can also observe growing sophistication and accuracy of AI which makes chatbots more robust and suitable for a broader range of applications. At the same time, there are also still challenges to overcome. Improvements in natural language understanding or moving towards a more flow-based conversations instead of only "single shot" dialogues are steps that will require more time, investment and research.

In this paper, of view we want to discuss the latest developments in the chatbot technology domain and provide you with example applications.

We hope you enjoy reading our Chatbot Point of view.

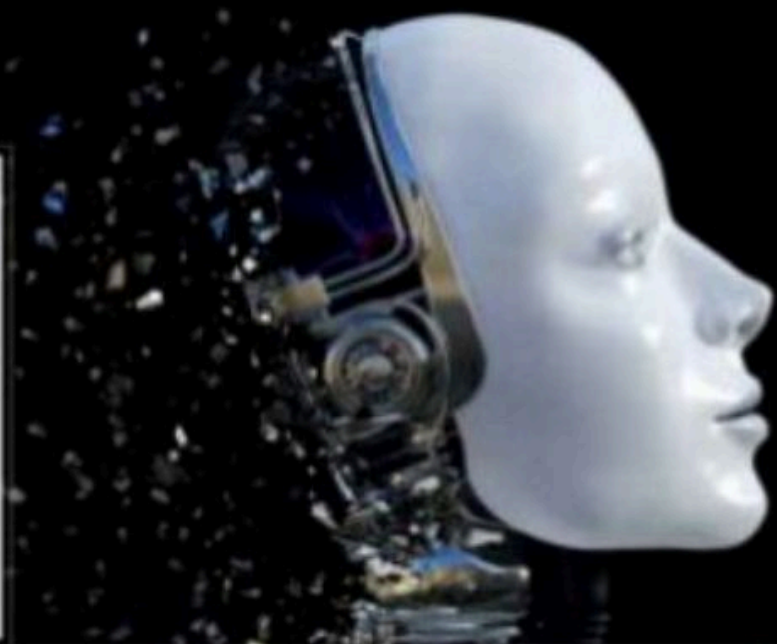
On behalf of Deutsche AI Team,

Naser Bakhshi  
Senior Manager Advanced Analytics & AI Lead

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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



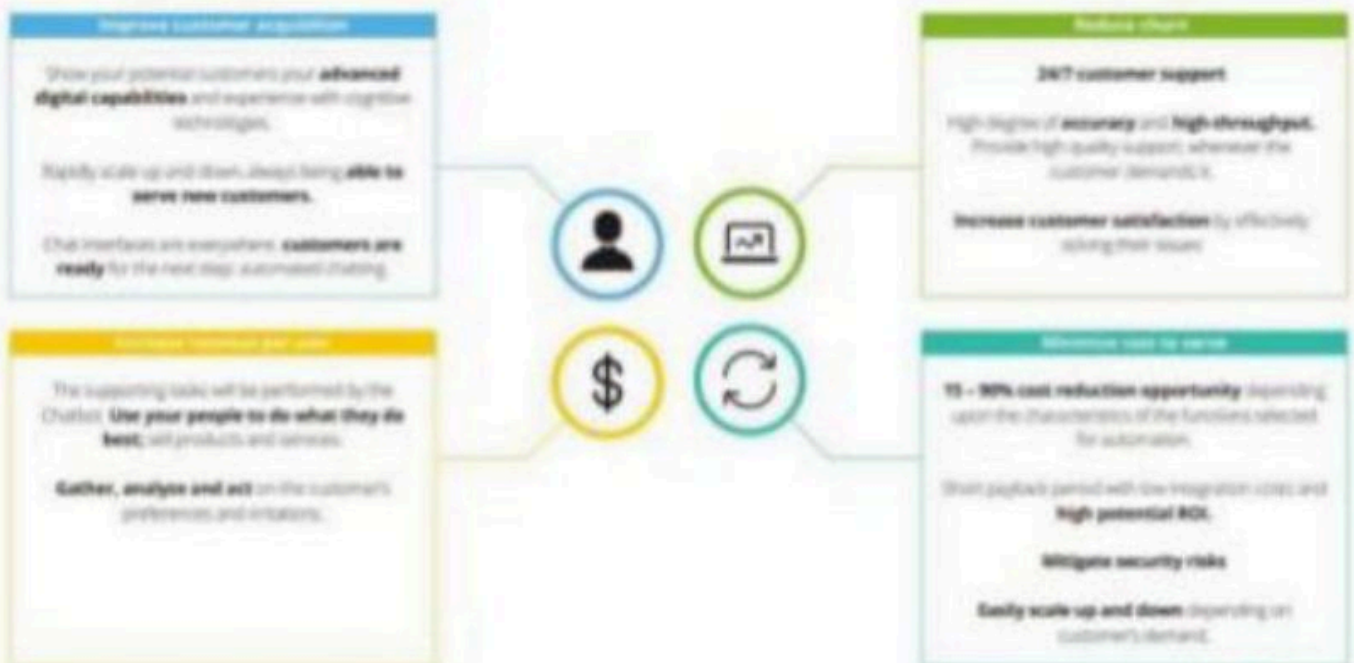
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# Value throughout your organization

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



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## 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

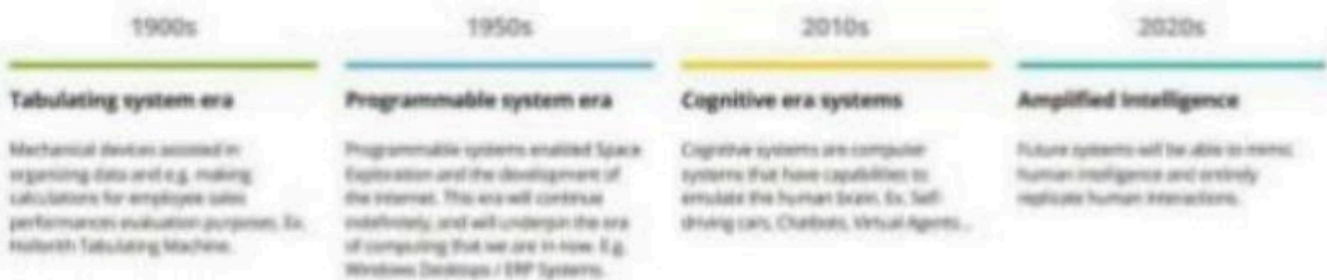


### Engaging

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

# Computer power driving Enterprise Intelligence

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



## Welcome to the Cognitive Era!

**Big data technologies** in conjunction with **cognitive computing** enable us to extract insights 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 costs 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.





## Chatbot Types

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# Evolution of Conversational AI

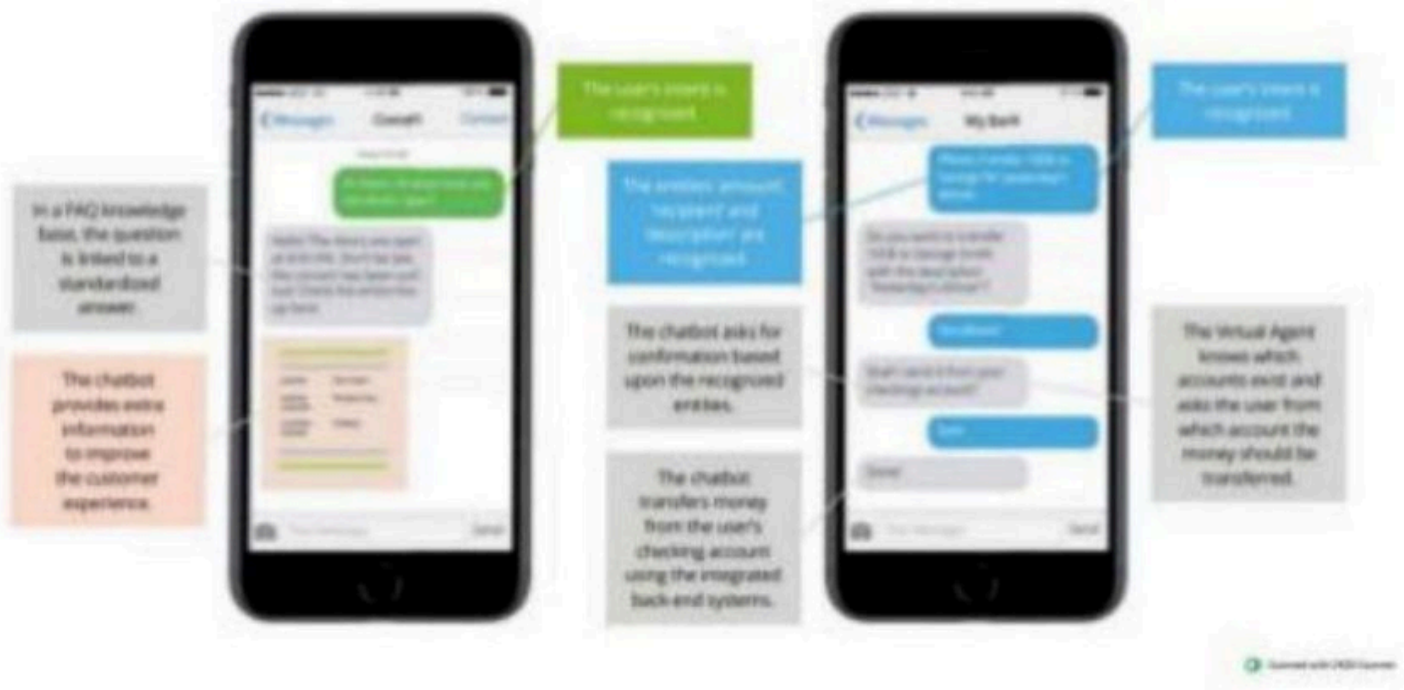
Chatbots are like apps that users interact with in a conversational way, through text or speech. As technology advances, Chatbots are able to better understand both written and spoken text.

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.



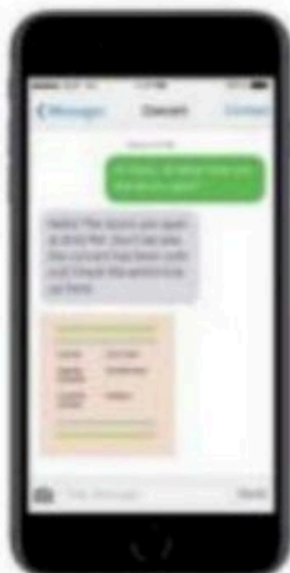
## Chatbots have different levels of intelligence...

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

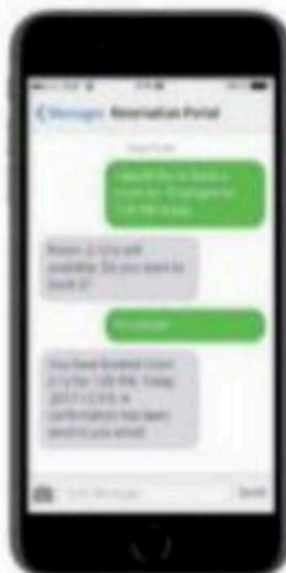


## Chatbot applications

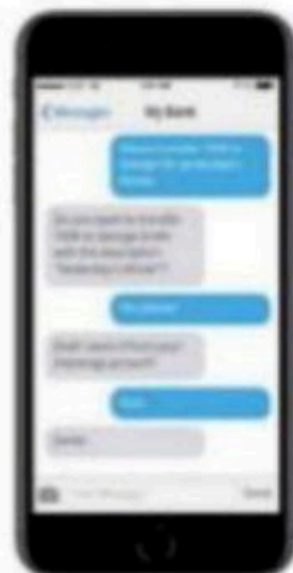
Chatbots have a broad range of applications: they help users with information requests, reservations or personalized tasks like money transfer.



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



You have just heard about an important meeting but are not at the office. Use the Chatbot to quickly identify

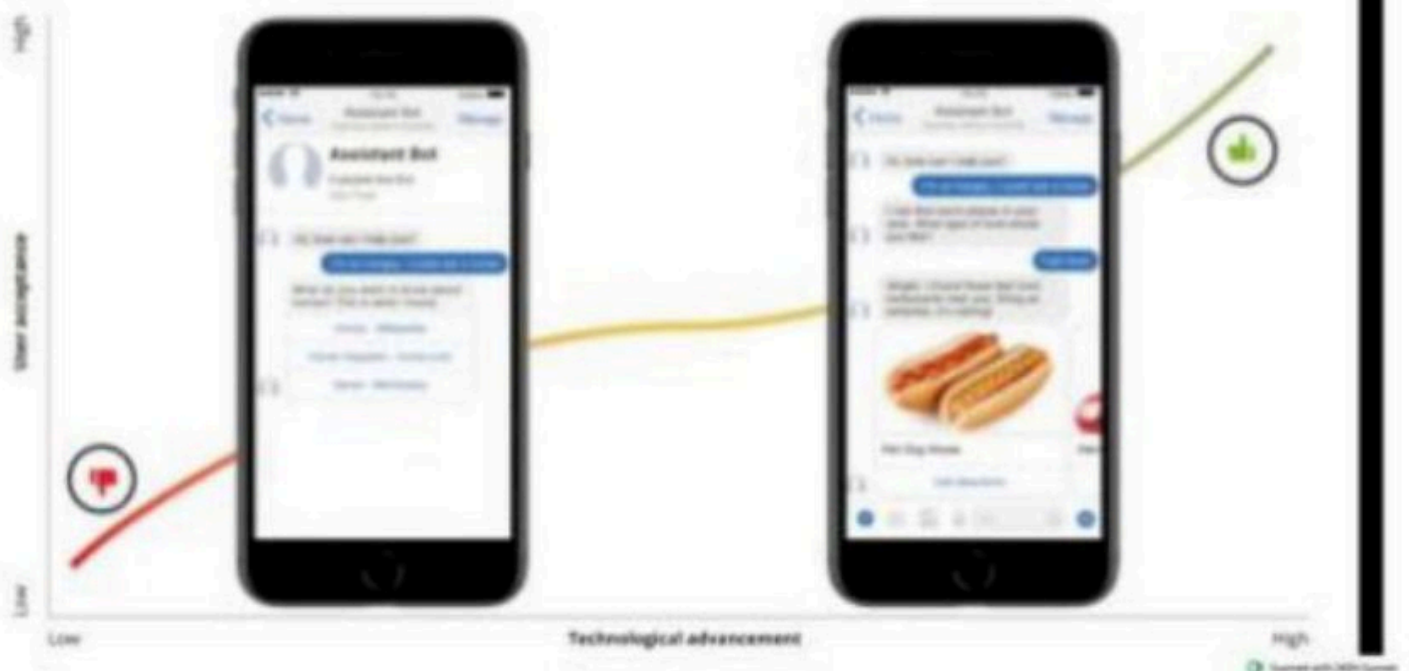


Instantly transfer money. Use a familiar interface to transfer money, request account information and

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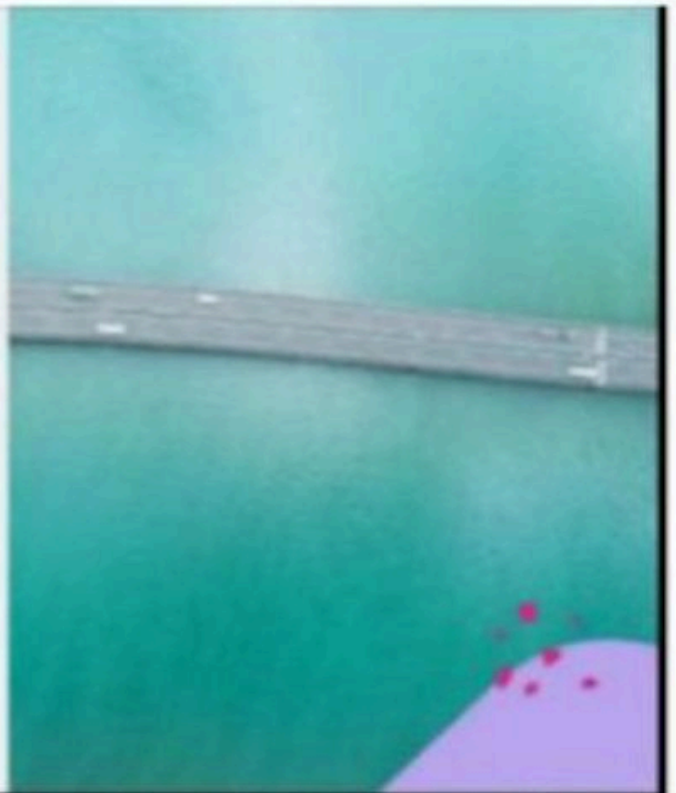
## Towards user acceptance

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 discerning context and user intent.



*Thank you*

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