Chatbot

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Introduction

Dear Reader,

Chatbots are a clear manifestation that Artificial Intelligence also 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 this 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 point 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 Deloitte AI Team,

Naser Bakhshi
Senior Manager Advanced Analytics & AI Lead

> "By 2020, the average person will have more conversations a day with bots than they do with their spouse"
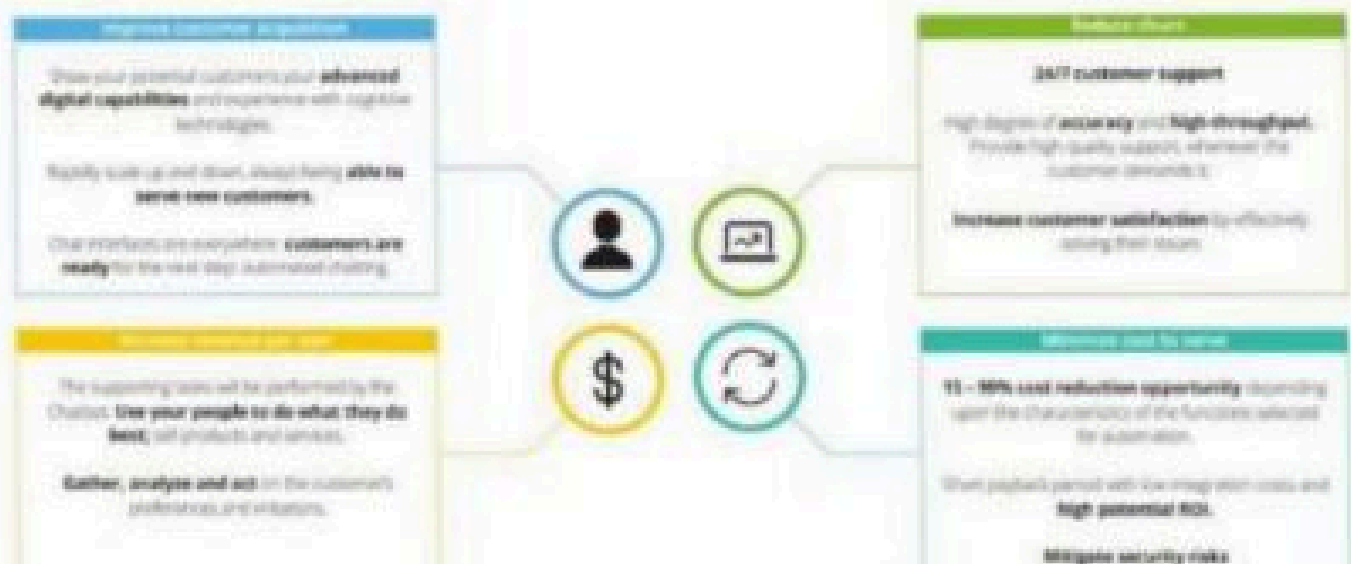>
> L. HEATHER PEMBERTON | GARTNER

Value throughout your organization

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.

Engaging

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

Effective

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

Computer power driving Enterprise Intelligence

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

1900s	1950s	2010s	2020s
Tabulating system era	**Programmable system era**	**Cognitive era systems**	**Amplified Intelligence**

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 on 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.

The Rise of the Chatbot

Chatbot Types

Evolution of Conversational AI

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 a the spectrum have valuable applications. Below are two examples of applications of different complexity and intelligence.
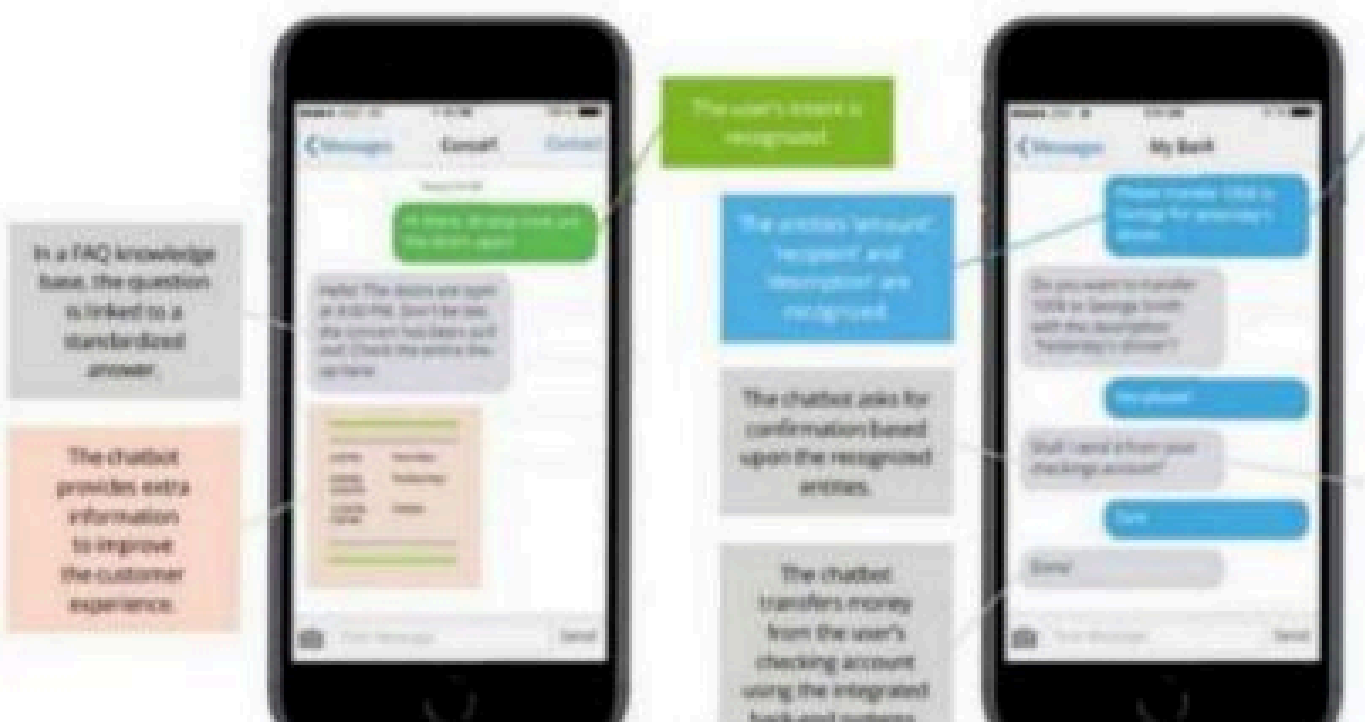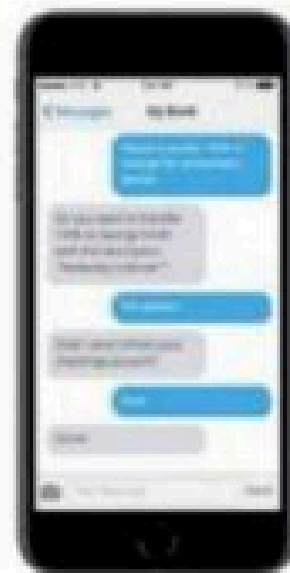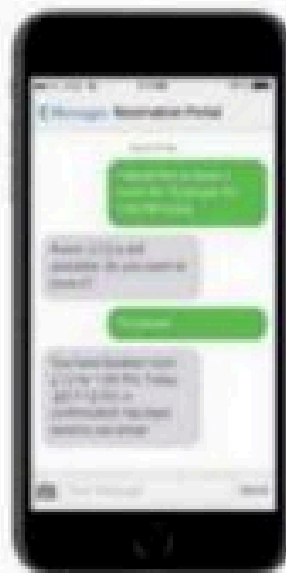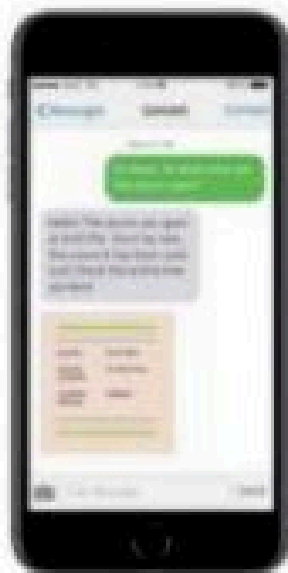
Chatbot applications

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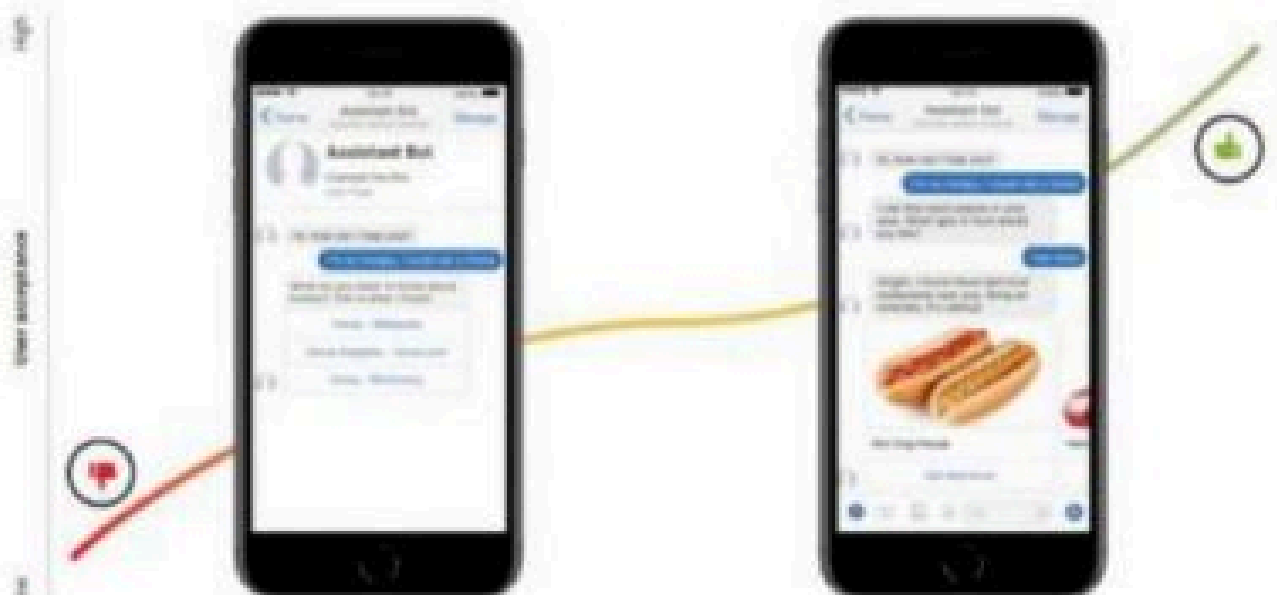
Towards user acceptance

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.

PROBLEMS

Hooray! Deep-learning based chat bots works well with Q&A scenario!

General problems

   Inhuman: restricted for model training sets

   Cannot "start" conversation

   Cannot handle continuous conversational context and its changes
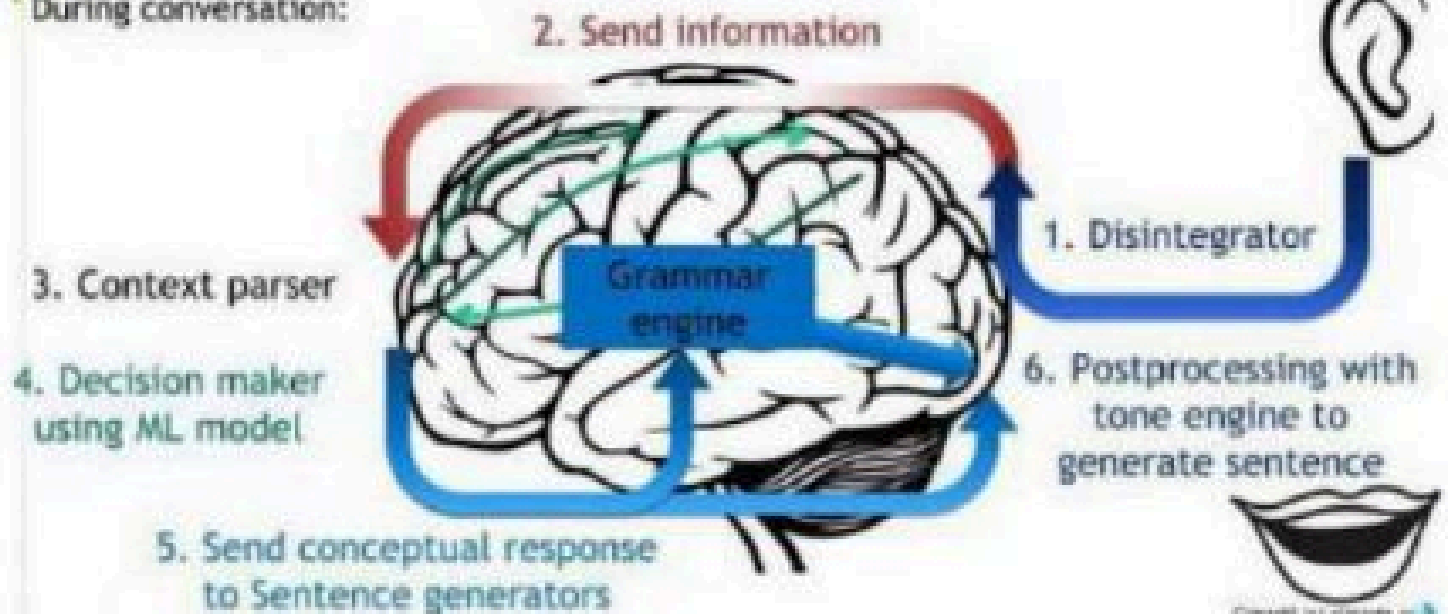
Korean-specific problems

   Dynamic type-changes

   Postpositions / conjunction (Josa hell)

IDEAS FROM STRUCTURE

During conversation:

2. Send information

1. Disintegrator

Grammar engine

3. Context parser

4. Decision maker using ML model

6. Postprocessing with tone engine to generate sentence

5. Send conceptual response to Sentence generators

thank you