Conversational AI: Intelligent Virtual Assistants and the road ahead.

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“Are you a bot?”

Photo by Octavian Rosca on Unsplash

In a fast-moving world, customers require efficiency and promptness when talking to any company**.** Here is where **chatbots** and I**ntelligent Virtual Assistants** (IVAs) come into play.

Thanks to their ability to engage into more advanced conversations, unlike rule-based chatbots, AI-powered systems are equipped with a multitude of features to assist and even entertain the users in their day-to-day activities. In addition to their customizable features, their self-learning ability and scalability have lead *virtual assistants to gain popularity across various global enterprises.*

According to Grand View Research, the global intelligent virtual assistant market size was valued at USD 3.7 billion in 2019, **growing at a Compound Annual Growth Rate (CAGR) of 34.0% over the forecast period**. The need for effectiveness across service-based companies and the integration of AI digital assistants among various devices, such as computers, tablets and smartphones, is anticipated to boost the market.

What can bots do in 2020?

There is certainly no doubt that recent advancements in technology have significantly improved the performance of chatbots and IVAs. But, however flawless they may seem at first sight, we could all agree on the fact that bots are still terrible conversationalists.

Rule-based chatbots. AI-driven chatbots.

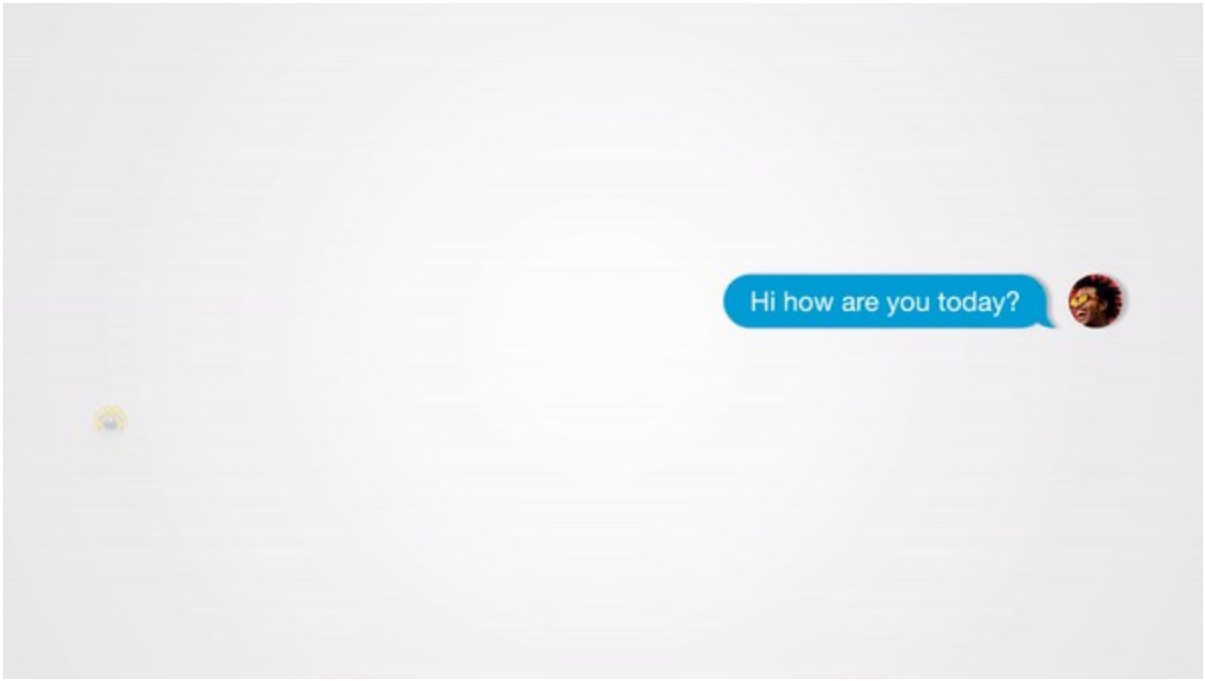
The basic ***rule-based chatbots*** are only accessible within chats and work on a *single-turn exchange*. In a nutshell, they react to questions asked by the user, detect the main intent, and return a single pre-defined answer accordingly. They are able to handle basic routine queries, for instance: **FAQs, reservations, online orders or appointment scheduling** (survey bots, meeting planners, foreign language tutors, travel & hospitality bots). Nevertheless, as soon as the user asks a question out of the bot's learned set of knowledge, it will automatically lead to failure.

On the other hand, we distinguish the **AI-powered chatbots**, that rely on core **Machine Learning** technologies like **Natural Language Processing (NLP)** and **Information Retrieval (IR)** techniques. By applying such methods, tech giants like Facebook and Google have released open-domain multi-turn chatbots (see Meena and Blender), that are able to reproduce more human-like conversations. However, the implementation of open-domain bots remains incredibly challenging due to many direct limitations of deep-learning.

BlenderBot

In April 2020, Facebook AI developed and open-sourced **BlenderBot**, *the first chatbot to blend a diverse set of conversational skills — including empathy, knowledge, and personality — together in one system*.

For all the great progress it represents for conversational AI, Blender is still far from reaching the level of humans. One of the challenges lies in its tendency to make up facts — because sentences are being generated from statistical correlations, and not from a knowledge database. As a consequence, it can string together an in-depth and coherent description of a well-known superstar, for example, but with entirely false information. The team intends to experiment further with integrating a knowledge database into the chatbot's response generation system.



Source: Facebook Research

Will chatbots be replaced by IVAs?

Most probably, yes. But what about our “state-of-the-artists” Meena and BlenderBot? They seem to be pretty smart chatbots, don’t they?

As enterprises across industries seek for ways to boost their customer experience, **IVAs are highly likely to gather momentum over chatbots**. You must now be wondering **why**, and the answer is relatively straightforward. Besides having the power of leveraging AI to drive transformations to the core of the business, IVAs are able to adapt and engage in more human-like conversations and enhance the user experience.

While the so-called **Voice Revolution** is taking place, some organizations believe that **avatars** simulating real persons would lead to even more successful assistants. How successful? Remains to be *seen*, literally.

Oops! Meena and BlenderBot can only… CHAT.

If you’re reading this, you have most probably talked at least once to either Alexa, Google Assistant, Siri, Cortana, or Bixby. And if you haven’t yet, you must be curious why voice-enabled AIs have become so popular in the past years. Let’s take a closer look!

Conversational interactions facilitated by digital assistants and high-quality Voice User Interfaces (VUIs) are set to be the real game-changer in the coming years. As Automatic Speech Recognition advances, a great demand of voice search will lead smart speakers and in-car systems to go hand in hand with IVAs.

Furthermore, voice technology is becoming increasingly important in the field of education. Supported by IBM Watson Machine Learning Accelerator solutions, **DeepZen** has developed deep learning and neural networks to recognize emotion in text and produce human-like speech. The organization believes that *voice technology can help students with spelling and the practice of times tables, as well as teaching them about AI and the world of the future.*

> *"Voice assistants are gaining popularity in education as more and more teaching apps are being developed.***" —** *DeepZen*

Never have I ever… SEEN virtual assistants.

A different approach is coming from Samsung's subsidiary STAR Labs, which has officially unveiled its "artificial human" project, Neon, at CES 2020. Neon is basically about creating digital avatars — computer-animated human likenesses — still unknown to the public up until today. The company explains that "Scenarios shown at our CES Booth and in our promotional content are *fictionalized and simulated for illustrative purposes only*."

NEON "artificial humans"

Taking things further, Replika has already integrated a beta version of 3D avatars, leading to many controversial reactions from the users' part. While many are excited about visually interacting with their replika and the technology behind it, others have decided to go back to the older version. Ever since the update, Replika's Twitter page has been hosting comments of users feeling "uncomfortable" and "scared" regarding the new "terribly creepy" avatars.

SO, whether these avatars are part of successful digital assistants' road ahead still remains an open question.

Take-home message.

The number of organizations using virtual assistants is expected to skyrocket in the coming years, given the fast-paced **evolution of NLP technologies**, the **rise of voice search**, and, respectively, the **development of e-commerce and e-learning**. In other words, the previously mentioned emerging trends lead us to believe that *old traditional rule-based chatbots are very likely to be substituted by IVAs.*

Mind that in spite of it all, challenges and concerns of **conversational AI development** are numerous and *bots remain presumably flawed.*