

Artificial intelligence, a new user interface?

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Abstract:

The Internet, as we are beginning to see, is undergoing a revolution owing to advances in artificial intelligence. This revolution, though technical, mainly affects uses (messaging services and vocal assistants). Having started in the 1950s, the automatic processing of natural language has, in the past few years, accelerated thanks to the progress made in artificial intelligence and deep learning. Though deprived of real understanding, computers are now able to see, hear and speak! This is going to durably alter the ever more “dematerialized” interactions between people and machines.

Vocal assistants for conquering the Web

What are the characteristics of the revolution now under way in the uses of the Internet?¹ Since 2015, the accumulated audience of messaging systems — the American Facebook Messenger, Canadian Kik, Chinese WeChat, Russian Telegram and others — has overshoot the audience of the social media as such.² By themselves, Facebook and the Chinese social media Tencent have more than three billion active users.³ The Internet is in the throes of a second revolution. Having just become mobile, it is now becoming conversational! As regards the astounding growth of conversational assistants, the platform of Facebook’s Messenger, launched during the African Conference in 2016, had a hundred thousand chatbots a year later.⁴

This revolution fits into a broader one, namely: the dematerialization of goods and services. In fact, this transformation of the Internet is bringing along a second change: the dematerialization of the interfaces between people and machines. The graphic interface is yielding to the conversational interface, which is flexible and easy to access since it requires nearly no learning phase. Conversation is the ultimate interface! Messages are now being exchanged via private or public messaging services and, more-recently, in the form of oral conversations thanks to “assistants” that are ever more present around us (Amazon Alexa, Google Home, Apple’s Siri, etc.).⁵

¹ This article has been translated from French by Noal Mellott (Omaha Beach, France).

² See “The WeChat revolution: China’s ‘killer app’ for mass communication”, 12 March 2014 at <https://gadgets.ndtv.com/apps/features/the-wechat-revolution-chinas-killer-app-for-mass-communication-494716> and “Facebook Messenger has 1.2 billion users and is now twice the size of Instagram”, 12 April 2017, <https://www.recode.net/2017/4/12/15263312/facebook-messenger-app-billion-users0>.

³ YEUNG E. “Messaging is eating the world”, 2015, <https://www.slideshare.net/EdithYeung/mobile-is-eating-the-world-by-edith-yeung>

⁴ “Facebook Messenger hits 100,000 bots”, 18 April 2017; <https://venturebeat.com/2017/04/18/facebook-messenger-hits-100000-bots>.

⁵ See “Google Home: Google pénètre dans votre salon avec ses trois enceintes”, <http://www.journaldunet.com/ebusiness/internet-mobile/1194558-google-home-google-penetre-dans-votre-salon-avec-ses-trois-enceintes/>; “Siri: The Ultimate Guide”, <https://www.imore.com/siri-ultimate-guide>; and “What Is Alexa? What Is the Amazon Echo, and Should You Get One?”, 1 February 2018, <https://thewirecutter.com/reviews/what-is-alexa-what-is-the-amazon-echo-and-should-you-get-one/>.

We should not oppose the spoken to the written word. Each of these vectors has its own uses (shorter exchanges for the former, longer for the latter) different contexts (for the former, the private sphere at home or in a car, and for the latter, the potentially public sphere at work or in public transit).

What markets do chatbots target?

The businesses and brand names that want to continue reaching their audiences now have to do so via messaging services and vocal assistants. They thus have the choice between either hiring brigades of “community managers” who will communicate with cybernauts or developing conversational “entities” (chatterbots, chatbots, or, more simply, bots). The choice is a cinch!

Let us look at four concrete uses of chatbots.

The first market for chatbots is CUSTOMER SUPPORT. We can easily imagine vocal assistants handling up to 50% of simple customer queries and referring an exchange to human operators when needed (very complicated queries, upset customers, etc.). Besides, conversational assistants on messaging services and webchats are available 24 hours a day, seven days a week; and they speak any language. A last point: their cost is incommensurable with call centers, which are often wanting in quality. Having clearly understood this, the major players in the helpdesk market (WebHelp, Acticall, etc.) are looking closely at chatbots.

The second promising market is “CONVERSATIONAL SALES”. We can already call a taxi or order a pizza via platforms such as Slack (a corporate messaging service that wants to oust e-mail). Botfuel, which proposes chatbot solutions, is helping the French lottery (FdJ) develop bets on sports in a conversational form via Facebook Messenger.⁶ The flexibility of the conversational interface allows for innovative interactions. On a website that sells books, we could imagine asking for the “most recent popular book on crime”. During the coming months, more and more e-businesses are likely to develop chatbots for their websites and mobile applications. By the way, mobile applis are becoming obsolete, inevitably since downloading software on a mobile (cell) phone is an anachronism during the era of cloud computing.

CORPORATE MESSAGING SERVICES is a third field ripe with opportunities. We can imagine replacing intranets (often not very practical to use) with conversational assistants that will, thanks to a few questions, provide requested information.

Some analysts go so far as to imagine that the greatest menace to search engines as we know them (as popularized by Google) will come from artificial intelligence and vocal assistants.³ To use a traditional search engine, the cybernaut has to be intelligent and know how to reformulate his query when it is ambiguous. With a conversational agent, the task of reformulating the query shifts shoulders since the chatbot asks the questions for “disambiguating” it and thus comes up faster with a result (ideally a single result — which never happens with a search engine).

The SOCIAL MEDIA is a fourth use case for chatbots, which can serve as moderators on the network, thus providing comments and answers in the place of “community managers”, whom the swelling stream of posts from cybernauts has overwhelmed.

⁶ “La Française des Jeux”, 2017, <https://www.botfuel.io/en/more/customer-stories/la-francaise-des-jeux>.

From the automatic processing of natural language to chatbots

Let us now take a look at the techniques and technological issues related to these use cases.

The history of natural language processing (NLP) runs back to the 1950s: and it is even possible to find earlier studies on this topic. In a famous article, Alan Turing proposed what is now called the Turing test as a criterion of intelligence.⁷ This test hinges on a computer program's capacity to personify a human being in a realtime conversation so convincingly that a human cannot be sure, on the basis of the conversation's contents, whether the other party is a program or a human. Written by Joseph Weizenbaum between 1964 and 1966, ELIZA was a simulation similar to a Rogerian psychological approach. Though using nearly no information on human thoughts and emotions, ELIZA sometimes managed to enter into what astonishingly resembled a human interaction. When the "patient's" knowledge exceeded the program's knowledge base (which was very small), ELIZA provided a general answer. For example, in response to "I have a headache", it would say "What are the symptoms?"

Technology has made strides since Turing's time. Techniques like deep learning are now familiar to the general public through, for example, applications for voice and image recognition, automatic translation and even the game of Go.⁸

More prosaically, a chatbot's ability to perform a complex service depends on its capacity to handle complex sentences by using algorithms for automatically processing languages. Several start-ups have staked out positions in this market to supply Web services for automatically processing languages. From a sentence written by a cybersnaut, such a service can extract an intention (intent classification) and the named entities (named entity extraction) and thus understand the meaning. Chatbots have to manage despite cybersnauts' errors and, therefore, be capable of correcting the spelling mistakes made in queries.

Botfuel is advancing in this direction. Since we think that whole conversations must be processed, we are tackling the problem of building a model of conversations that can manage multiple intentions, digressions, switches of context, etc. This is an attempt to build chatbots of the second generation. Unlike ELIZA, these new bots will try not to pass the Turing test but to propose less rigid interactions to the people using them.

⁷ TURING A. (1950), "Computing machinery and intelligence", *Mind* 59(236), pp. 433-460. Available via: <https://academic.oup.com/mind/article/LIX/236/433/986238>.

⁸ "AlphaGo Zero: Learning from scratch", 2017, <https://deepmind.com/blog/alphago-zero-learning-scratch/>

Conclusion

As we have seen, the Internet, ten years after having switched to mobile telephony, is undergoing a second revolution — of uses, as illustrated by messaging services and vocal assistants. Meanwhile, technological advances (in particular deep learning) are overcoming obstacles. Computers can now see, hear and speak (even though they still lack realtime understanding)! The conjunction of these trends is going to deeply and lastingly transform interactions between people and machines in the direction of ever more dematerialization.