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Chatbots on the Rise: A New Narrative in Journalism

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Abstract

With the advent of Web 2.0, new forms of journalism arose, paving the way for the implementation of computational and automatization processes in all aspects of mass communication. As such, chatbots have already been adapted in the news media platforms bringing forward a series of issues and effects upon journalistic narrative, content and professional practices. This paper presents the role of chatbots and their characteristics, discusses the application of different types of chatbots in the news media and presents a theoretical overview of the advantages and disadvantages regarding their adaptation in journalism, as well as key ethical concerns connected to the emergence of this new journalistic narrative.

Keywords: bots, chatbots, conversational bots, narrative, journalism

1. Introduction

Although chatbots constitute a rather new chapter in the technological evolution of news media, the notion of bots is not a new trend. Back in 1966, Joseph Weizenbaum developed with ELIZA (https://www.masswerk.at/ elizabot/) a computer program that demonstrated the possibilities of communication between a human and a computer via natural language and, as such, he introduced the first generation of bots; when replying, the machine took on the role of a psychotherapist, worked on the basis of a structured dictionary and looked for keywords in the entered text (Gentsch, 2019).

Several decades later, Web 2.0 opened the door to the massive use of social media through portable digital devices, such as smartphones, tablets, etc., and decisively altered news consumption patterns for the globalised media audience (Maniou & Veglis, 2016; Maniou, Panagiotidis & Veglis, 2017). As such, new forms of journalism arose, paving the way for the implementation of computational and automatization processes in all aspects of the communication process. In this perspective, it was only a matter of time for bots to adapt in the news media platforms, bringing forward a series of issues and effects upon journalistic narrative, content and professional practices.

Chatbots can help journalists tell their stories differently or collect information from readers. This effort was also supported by social networking services, which quickly embraced this tool. A typical example is Facebook, which incorporated chatbots into their messaging services and allowed its users to create their own chatbot on the environment of Facebook messenger (Walker, 2018).

This paper presents the chatbots and their characteristics, discusses the role and application of different types of chatbots in the news media and presents a theoretical overview of the advantages and disadvantages regarding their adaptation in journalism. The paper is organized as follows: Section 2 defines chatbots and analyzes various chatbot categorization based on different characteristics. Next, various applications of chatbots in the media sector are briefly discussed in section 3. In section 4 the advantages and disadvantages of employing chatbots in the media sector along with a discussion of various ethical issues are presented. Concluding remarks can be found in the last section of the paper.

2. Definitions and Types of Chatbots

In previous years various efforts have been implemented to propose unique methods of news reporting. From the traditional static, written news texts, we have moved to multimedia articles that interact in various ways with users, and

we are starting to encompass automated, interactive news chatbots (Thurman, 2019). Text chatbots have attracted considerable attention by the scientific community (Dale, 2016; Shevat, 2017), and can be seen as an intermediate stage before moving to voice chatbots.

Chatbots or conversational bots can be defined as software programs (or even, in some cases, hardware) that are able to respond to text or even voice messages (Shevat, 2017). Those programs attempt to simulate responses of a human being, thus act as natural language user interfaces for data and service providers (Dale, 2016; Janarthanam, 2017). They can be programmed to respond differently depending on the existence of certain keyword or they can be more sophisticated and employ machine learning techniques to adapt their responses based on the included words in the queries (Janarthanam, 2017; Shevat, 2017).

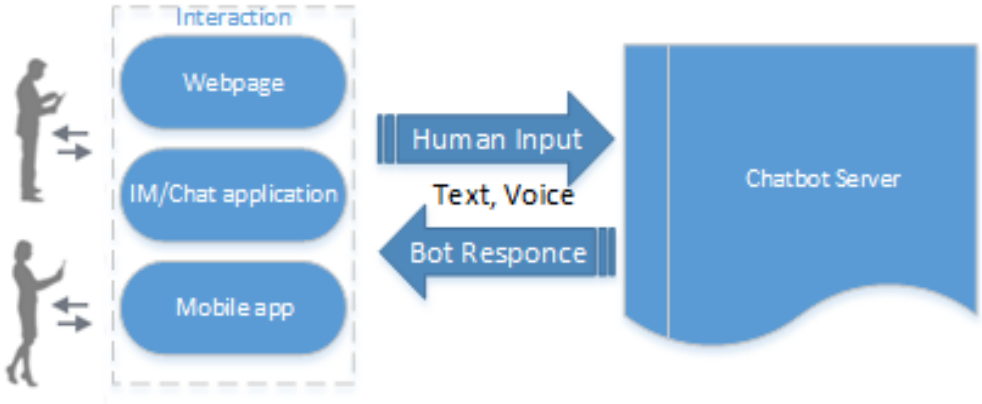

Figure 1. Chatbot anatomy

Figure 1 roughly describes the anatomy of a typical chatbot. The interaction with the user is facilitated through a webpage, an IM/Chat application, or a mobile app. The type of interaction is text or, in some cases, voice. In the case of voice interaction, speech to text conversion is required, which is usually achieved through a cloud service. In any case, text is the basic means of interaction. The chatbot server is comprised of the logic and rules parser and a knowledge base, which allow the recognition of the input text and thus triggers a response based on predefined rules. In case that the chatbot is more advanced, a NLP module validates the input text by performing sentiment analysis and instructs the knowledge base to respond accordingly to the result (Borisov, 2018).

Chatbots can be classified in various ways. For example, depending on the type of answer a chatbot is able to provide, they can be classified as Retrieval-based, in which chatbot incorporates a repository with predefined responses, and employs a heuristic process to select the appropriate response based on the input and context (Yu, Wei, Chen, Zhoujun, & Ming, 2017). This method can range from a rule-based selection to Machine Learning classifiers (Kojpuharof, 2016). In other words, the responses from this kind of chatbots are predetermined. There are also bots that are based on Generative models, which do not rely on pre-defined responses. In this case, chatbots are able to generate new responses and they are supported by Machine Translation techniques (Ramesh, Ravishankaran, Joshi, & Chandrasekaran, 2017).

The majority of chatbots are based on the Retrieval-based model and they exhibit considerable limitation due to the fact that they are unable to correspond to unknown cases for which predefined answer exists. Also, they are unable to refer back to contextual entity information like names mentioned earlier in the conversation. On the other hand, since they rely on programmed response repository, they do not exhibit grammatical mistakes, thus offering a good experience to users who interact with them (Kojpuharof, 2016). In the case of generative models, they are supposed to produce better results, but they still remain at a developing stage (Ramesh, Ravishankaran, Joshi, & Chandrasekaran, 2017; Yu, Wei, Chen, Zhoujun, & Ming, 2017).

Another classification that can be considered for chatbots is the distinction among Short-Text Conversation, which is easier to support, and the long Conversation, which- as expected -is more difficult to support since the chatbot needs to keep track of all the information it has received (Kojpuharof, 2016). According to Srinivasan, Nguyen, & Tanguturi (2018), chatbots can be categorized in four types, namely, informational, Transactional, Enterprise Productivity and Device Control, depending on the work they are assigned to complete.

Currently the main focus of chatbots design and develop is for mobile messaging application (Brandtzaeg & Følstad, 2017). Today there are online tools available that allow users with limited experience to create online chatbots. Those chatbots are comprised of online modules (online services) that can be interconnected online by defining certain parameters and they can even include NLP modules which allow, to some degree, a natural conversation between the

user and the bot. Typical services that can be employed may be Dexter (https://rundexter.com/), Dialogflow (https://dialogflow.com/), Chatfuel (https://chatfuel.com/), etc.

3. Applications and Examples in the News Media

Chatbots can be used to support a new way of news reporting. Specifically, users can use a chatbot to ask questions about news events, people, or places, and the app replies with relevant content. The Quartz company is developing such an application (Seward, 2016). Hepp & Loosen (2018) have already described Chatbot journalism as a relatively new technology, although it already shows signs of further development, as established newsrooms are also working with messengers and chatbots to reach wider audiences.

In Europe, one of the pioneering media sources has been the British newspaper, *The Guardian*. Already interested in bots in 2010, this media conglomerate carried out two projects of automated sports news that allowed them to obtain statistics of games and historical information of teams and players, and they also combined these data with pre-made phrases and connectors to compose stories (Bunz, 2010). A year later, they launched an app that allowed them to automate the search for current news via Twitter, and in 2014 they launched the so-called *Guarbot* (Gani & Haddou, 2014), a program that complemented financial information with complex data, avoiding the need to use journalists for this task (Sanchez-Gonsales & Sanchez-Gonsalez, 2017). Another initiative of Guardian was the introduction of a chatbot that communicates with users through Facebook Messenger, by sending them news briefing every morning with the top news stories (Good & Wilk, 2016). Accordingly, *Associated Press* uses similar technology to automate their corporate earning stories with *Wordsmith*, a software tool developed by Automated Insights (Dorr, 2015).

It is obvious that media companies are still experimenting and investigating methods to incorporate chatbots into their publishing channels. Their efforts so far have been concentrated on using chatbots through widely used messaging application as a means of delivering a news bulletin or even breaking news. Thus, they are attempting to tap their news stories in the everyday users' activities. Although this step seems quite logical, it cannot be considered as a method of fully exploiting the unique characteristics of a chatbot, namely the ability to have some kind of conversation with the user.

Microsoft considers a different future for chatbots. Microsoft's SEO Satya Nadella believes that chat-based interfaces will replace apps as the primary method for people to access internet; instead of running an application and entering data in a predetermined way, the user can have a conversation with the application in a basic language in order to tell it what he/she wants to do (Walker, 2018).

Whatever future holds for chatbots and the global media industry, one thing is certain: chatbots offer a new interface for communicating with a story. Just imagine a news article that will include a chatbot in which the reader can apply questions in order to obtain additional information or clarifications! In more complex news articles (i.e., data journalism articles) (Veglis & Maniou, 2018) such capabilities could be extremely beneficial. Overall, chatbots can increase significantly the interactivity of a web news article, something that is considered to be very important for web content.

4. Advantages, Disadvantages and Ethical Issues

Undoubtedly, the application of chatbots in the news media reshapes the narrative of journalism, since not only they allow the personalization of the information delivered and the immediate interaction among sources and recipients but, also, they are doing so through trusting speech by which they seek to generate emotion, and along with it, foster loyalty (Sanchez-Gonzales & Sanchez-Gonzalez, 2017).

This new journalistic narrative, equipped to deal with the vast growing number of data information and, in this way, assist journalists in filtering and authenticating their news stories, can lead to a new type of media accountability; as Diakopoulos & Kolinska (2017) argue, it can lead to the formation of a transparency framework, deriving from the 'algorithmic accountability reporting', which can articulate biases in the news stories (Diakopoulos, 2015; see also Thurman, 2019).

Additionally, the advent of personalized news, perceived here as news tailored to the preferences of individual users by 'explicitly registered' and/or 'implicitly determined' means (Thurman, 2011) facilitated through chatbots, can lead to the increase of media audiences. Consequently, it can extend the advertising audience and lead to greater profit for media entities, provided that the relevant software and technology costs could come in affordable prices for all types of media entities, local and regional companies included (Diakopoulos, 2017; Flew et al., 2012; Thurman, 2019).

However, the potential loss of human jobs, following all these trends, has become a major issue during recent years. Leading forecasters for the media sector mention that almost 50% of human jobs may be at risk (Rainie & Anderson, 2017) due to the automatisation of media platforms, while scholars have already started analysing a vague future in which human journalism may meet its end (Latar, 2018).

The possibility that follows these automatisation processes -the fundamental pillar of robot journalism - that human journalists may become obsolete, indicates a series of issues for journalism itself. Professional journalists, through the practice of intensive and risky investigative journalism, attempt to reveal new facts and social trends and with their narrative talent, experience, their values, creativity and intuition convert these facts into journalistic stories for their audiences (Latar, 2015). And although the implementation of chatbots in media platforms may generate several advantages regarding media entities (mainly regarding cost and funding), it is evident that the elimination of human journalism poses real dangers to democracy, even to the point of endangering democratic societies' survival (Latar, 2018); albeit early studies in the field that assessed the idealistic potential that this type of computational journalism might create new blendings of audience, reporter, and commentator that might grow the audience for watchdog journalism and enhance citizens' involvement in the democratic watchdog process (Hamilton & Turner, 2009).

At the same time, a number of ethical issues arise regarding the social responsibility of journalism. Values such as objectivity, neutrality, confirmability, and the role of journalists as intermediaries (Dorr & Hollnbuchner, 2017) were deployed in hundreds of years and established via prolonged fights between representatives of the Fourth estate, on the one hand, and political regimes, on the other. However, as technological trends present significant effects upon journalistic practices, the social responsibility of journalism seems to be relying merely on algorithms and automatisation processes, excluding the human factor and generating unprecedented ethical issues. Issues of digital, algorithmic and cyber ethics regarding the media sector in relation to technological alterations have been thoroughly discussed in the past several years (Annany, 2015; Culver, 2016; McBride & Rosenstiel, 2014), indicating a significant shift of responsibility in news production (Dorr & Hollnbuchner, 2017.

5. Conclusions

The transition from bots to chatbots has not been an easy way, however today automatisation techniques seem to have found their way through journalism and news media platforms. Automation was initially aiming in reducing human effort and squeezing time out of the many chores journalists must undertake to get the news out to the public in the era of big data. But this new wave of automation in the business incorporates many forms of what is commonly referred to as 'artificial intelligence' or 'cognitive technologies', which seem to be aiding both the inputs and the outputs of journalism (Marconi & Siegman, 2017).

Initially, the use of chatbots in media platforms was seen as a means to cut back in human labor, generating in this way a series of problems for the already troubled journalistic professional environment. Additionally, issues regarding the creativity and originality of news have arisen, centered around the basic argument that robotics could never replace human journalism without posing a real threat to the critically acclaimed democratic values of the western world. Added to all these, concerns regarding ethical issues were once again raised centered on the fundamental argument of 'human value over machinery'. On the other hand, the application of chatbots has shown that they can unburden the human journalist from daily routine work, reduce pressure for producing quantity of news and, instead, allow them to concentrate on quality, free up capacities for in-depth analysis and reporting and, thus, enable journalists to consider moral demands in journalistic work, like checking of multiple sources, reflection, and diligence (Dörr & Hollnbuchner, 2017), especially in the era of big data.

In any case and regardless of the evolution of technology, the undeniable truth is that a new journalistic narrative has emerged. Chatbot journalism, as a logical transformation of robot and computational journalism, is on the rise, generating opportunities as well as new challenges, both for the audiences and for the journalistic profession. What was once unimaginable - that news organizations would publish content that had not been fully vetted by the copydesk – has already become a daily routine (Harlow, 2012), following economic and market competitiveness pressures. Taken from this point of view, this new journalistic narrative could offer a realistic and viable solution to the problems journalists have to face in the age of big data, provided that professionals and news media entities managing such processes in newsrooms, will go through the legal as well as social and ethical consequences of such technologies (Lewis, Sanders & Carmody, 2018). After all, the future of journalism is partly entangled with the evolution of technology and the way(s) of its implementation upon the process of mass communication.

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