

DOSSIER

# WHO CONTROLS THE VOICE?

## The journalistic use and the informational domain in vocal transactors



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**ABSTRACT** – This article aims to understand the transformations caused by new informational ecosystems in contemporary journalism. This analysis is performed based on news accessed through personal digital assistants embedded in smart speakers. As a methodological procedure, it adopts a multiple case study, defining the vocal transactors of Google (Nest Home/Google Assistant) and Amazon (Echo/Alexa) as its object. Therefore, this paper notes that the inclusion of algorithmic routines and the extension of news content to intelligent voice interfaces requires adaptation for the personalization of information, an ecosystem that is feedback by traditional vehicles, journalists, and people who interact with the artifacts.

**Key words:** Journalism. GAFAM. Vocal transactors. Alexa. Google Assistant.

## QUEM CONTROLA A VOZ?

### O uso jornalístico e o domínio informacional em transatores vocais

**RESUMO** – O presente artigo tem como objetivo compreender as transformações causadas por novos ecossistemas informacionais no jornalismo contemporâneo. A análise é realizada a partir de notícias acessadas através de assistentes pessoais digitais embarcados em alto-falantes inteligentes. Como procedimento metodológico, adota o estudo de caso múltiplo, definindo como objeto os transatores vocais da Google (Nest Home/Google Assistant) e da Amazon (Echo/Alexa). Observa, portanto, que a inclusão de rotinas algorítmicas e a extensão de conteúdo noticioso para interfaces de voz inteligentes demanda adaptação para a personalização das informações, ecossistema retroalimentado por veículos tradicionais, jornalistas e pessoas que interagem com os artefatos.

**Palavras-chave:** Jornalismo. GAFAM. Transatores vocais. Alexa. Google Assistant.

## ¿QUIÉN CONTROLA LA VOZ?

### El uso periodístico y el dominio informacional en transatores vocales

**RESUMEN** – Este artículo tiene como objetivo comprender las transformaciones causadas por los nuevos ecosistemas informativos en el periodismo contemporáneo. Este análisis se realiza en función de las noticias a las que se accede a través de asistentes digitales personales integrados en altavoces inteligentes. Como procedimiento metodológico, adopta un estudio de caso múltiple, definiendo los transatores vocales de Google (Nest Home/Google Assistant) y Amazon (Echo/Alexa) como su objeto. Señala, por lo tanto, que la inclusión de rutinas algorítmicas y la extensión del contenido de noticias a interfaces de voz inteligentes requiere adaptación para la personalización de la información, un ecosistema que es retroalimentado por vehículos tradicionales, periodistas y personas que interactúan con los artefactos.

**Palabras clave:** Periodismo. GAFAM. Transatores vocales. Alexa. Google Assistant.

## 1 Introduction

The relationship between Journalism and algorithms is often observed through the prism of the agents' role in selecting which information will be presented in timelines and similar spaces at social network websites (Recuero, 2011; Araújo, 2017). Afterward, another movement was accomplished, addressing automatic routines in the selection and construction of news content processes (Diakopoulos, 2019; Marconi, 2020). These processes culminate in constructing another space for the use of automatic journalistic routines: the delivery of information in personal digital assistants embedded in voice assistants and other devices that support its functionalities.

These “host” artifacts have a multiple nature since they are always ready to present sonorous content based on an evocative act at the environment in which they are installed, but its pervasiveness covers the user’s life through its permanent presence in daily life by embedding the same voice recognition software in smartphones, smart speakers, wearables and other smart devices. Personal digital assistants like Alexa and Google Assistant, among others, accompany their users, serving with news and pieces of information whereas quantifying and analyzing the person who constitutes a login in the name of their services’ personalization.

Therefore, these connected products use networks and structures of large technology companies such as Google, Apple, *Facebook*, Amazon, and Microsoft (GAFAM). They are physical extensions of affordances offered online or in other connected artifacts and concentrate its users’ digital lives by interconnecting several services, such as agenda, sending messages, among others. Thus, they constitute an object that emphasizes the formation of an information consumption ecosystem. In the case of Alexa, it is also a vector for purchasing physical goods through Amazon.

Therefore, such products/software are a kind of digital “Trojan Horse”, as they enter domestic spaces as process facilitators but allow their real controllers to understand and offer services to retain and expand consumption within their structures. In this sense, they are called vocal transactors (Cayley, 2017), as they allow operations that range from music streaming to the purchasing of everyday products, such as toothpaste.

This contemporary movement is fundamental to understanding a change in how we use the Internet, mainly from two points. The first is the transition from a network based on searching for information to another that automatically starts offering this content. It is worth mentioning that this process derives from the contemporary culture of applications (Gardner & Davis, 2013; Pellanda, 2010), which transformed generalist access into a routine based on applications dedicated to the most diverse purposes. This movement turned the network more tactile, from initially based on the use of keyboards to gestures with devices, and then modifying this main action to a purely vocal act, thus enabling the construction of a sound dialogue with the digital universe.

Understanding this scenario is not simple and requires new researching strategies. Although companies publish tutorials

and support courses (Amazon Alexa, n.d.; Google Assistant, n.d.) to construct and implement these routines, there is no clarity on how the process works. The transition to the algorithmic universe eliminates among the public the understanding of a space, such as that of journalistic newsrooms, as a place for the production and investigation of content. The interface speaks but does not always display its speech location. If traditional journalistic companies have been gradually understanding this universe, research is also observing the dilemmas at an early stage of construction (Pase et al., 2019; Santos, 2019; Noll, 2020). It is necessary to outline strategies that understand the context and explore possible information to elucidate how routines operate.

This article uses multiple case study methodology (Yin, 2001, 2018) to define its objects and compose an understanding of its properties. To understand GAFAM companies' dimensions and how they shape the scenario, at first two examples belonging to the core will be analyzed, as an initial mapping: the Alexa interface present in Amazon's Echo Dot and Google Assistant embedded in Nest Home. Through these voice transporters, specifically, we can observe some of the possibilities they offer to consume journalistic content. These two products are offered for purchase in Brazil and, although the latter does not have an official store, the company is present with its assistant on thousands of phones which runs the Android operating system in the country.

The choice of the object of study is based on the fact that currently, in Brazil, these are the two most popular voice transporters, either due to the artifacts or the speech recognition software embedded in them. Likewise, we consider that Siri and Cortana, embedded respectively in Apple and Microsoft artifacts, have not yet reached the same level of popularity as the two aforementioned personal digital assistants while *Facebook's* Portal voice assistant uses Alexa, from Amazon, as speech recognition software. Thus, in this proposal, we will carry out a series of actions on the interfaces of Google and Amazon to understand how they operate on presentation of journalistic information, accounting for the cultural, economic, technological, and social context that also encompasses other core companies: Apple, Microsoft, and *Facebook*.

## 2 Contemporary informational ecosystem

In this context of the transformation of journalism, it is fundamental to understand how the change to a new digital ecosystem affects and interferes with this process's consumption and distribution. This new digital economy is driven by significant Internet technology companies such as Google, Amazon, *Facebook*, Apple, and Microsoft (a group known as GAFAM). According to *Forbes's* annual ranking, GAFAM core companies are the five most valuable brands globally (Badenhausen, 2019) and form a stable economic monopoly among themselves.

These corporations have replaced large media conglomerates and cultural industries with a new relationship between technology and people. "These companies compete for the attention of users, develop media products and services and attract most of the online advertising investment" (Bustos & Castillo, 2019, p.804). However, it is essential to understand how GAFAM works to maintain this hegemony, which is no longer only economical since it is part of consumers' daily lives.

The digital economy, formed by intangible products (software) and services, operates on a globalized scale, and GAFAM occupies essential positions in this context. Bustos and Castillo (2019, p.805) divide the activities into three areas: "Infrastructure (network, devices, software, telecommunications, IoT and facilities); commercial transactions; and the digital media content (free and pay media, Big Data supported, etc.)". Analyzing the examples given by the authors, we can see that there is a large presence of products and solutions entirely digital, which dispense costs with traditional physical distribution and production.

By contemplating virtually all the digital economy activities, these companies form a kind of ecosystem of their own since they are not only present as a single product or service and may or may not be compatible with competitors' products and services. In a general context, they prioritize the user to use the complementary tools of the company itself, feeding their particular ecosystem.

Competition through this formation of ecosystems, and not just products, is one of the main characteristics of GAFAM. In this scenario, it is possible to observe how difficult it is for new technology companies to enter or participate in the digital environment already formed since there is already a hegemony in the market. When a

new company with innovative technology emerges, a core company is often bought that integrates recent expertise into its ecosystem, preventing the rise of potential competition. In addition to buying smaller companies, there is vast investment in internal research since there is a dependence on innovations, whether on products or services. This process makes core companies a source for inventions and patents, including being prominent investors in solutions involving the Internet of Things (Bustos & Castillo, 2019).

In this new era, handheld devices have become wearable, and are moving past wearable to embedded. We're in that era now. From a device that you can put down when you're done with it to a device that you take off like jewelry to a device that would require outpatient surgery to disconnect, smart devices are going beyond the personal, to the intra-personal. At the same time, these devices are deeply entwined with the Internet, talking to other devices in a new "Internet of things", bypassing their slow fleshy hosts. The two trends of smaller and more intimate devices and of an increasingly ubiquitous network are coming together to produce something that transcends either individual technology. (Swaine & Freiburger, 2014, p.369).

With software and devices, whether apps, a smartphone, or a vocal transactor, companies collect information about their interactors and the use of digital tools. The success in the dispute for attention results in an immense amount of data that, when compiled and analyzed, culminates in what we know as Big Data, which becomes the primary driver of technology companies.

Digital technology has quickly infiltrated our daily lives, we are not just consumers, we create data, we deepen our digital footprints, we let a part of our lives be recorded and become data. This material can be transformed into a product or service and with this transformation that machine learning is gaining ground, as with voice assistants with embedded digital personal assistants such as Google Home, Google, Echo, Amazon and Apple's HomePod. (Noll, 2020, p.50).

This invisible and constant presence of GAFAM in people's lives does not occur only through devices and software. As pointed out, technology companies have conquered and replaced positions that once belonged to traditional media groups, where journalism – initially – is inserted. However, this market achievement transformed the format and dissemination of journalistic information, making the relationship between journalism and digital platforms a convergent process (Bell & Owen, 2017).

### 3 Journalism and algorithm in the context developed by GAFAM

In general, journalism has always been closely connected to Technologies (Pavlik, 2000; Deuze, 2006). In drawing a brief timeline of this relationship, Deuze highlights that “[...] the 19th century, is linked to the (appearance, growth, solidification of) written press, the 20th century is connected to radio-television and the 21st century is very likely to connect to digital (wireless) multimedia platforms” (Deuze, 2006, p.17). However, the platforms are part of a market based on a large volume of information, where journalism has a small share. This presence works according to the platform’s demands, based on scale, revenue, speed – and the need to adapt to the platform’s engine transforms journalistic production (Bell & Owen, 2017).

After more than a decade, Deuze’s (2006) chronology remains relevant. However, the popularization of the internet and its commercial use in the end of the 20th century provoked significant changes that bring us to the present day. As the author predicted, more than digital wireless multimedia platforms, we arrived at the automation and ecosystem integration of these platforms in different forms of materializations.

Automation can be observed both on the axis of information collection and on the production and distribution/access of news (Dörr, 2016; Lewis, 2015), all of which are shared by a common element: algorithms. Computational journalism, or Big Data journalism, is an example, when the work is performed not by a person, but by artificial intelligence that collects data and information and transforms them, quickly through natural language, in a journalistic text (Dörr, 2016).

This genre’s emergence evokes reflections that shift the centrality of the journalistic activity from the human component, where technology is purely instrumental. Primo and Zago (2015) question who does journalism? With that question in mind, they suggest an exchange of perspective through Bruno Latour’s actor-network theory (TAR). This perspective seeks a more horizontal view of the devices necessary for journalistic activity concerning the journalists themselves. While platforms work through algorithms, avoiding investment in human strength, journalism needs human judgment (Bell & Owen, 2017).

Looking back to the first years of the network for commercial purposes, beginning in the 1990s until the 2000s, “[...] the internet witnessed changes in the distribution of information” and “the years

2010s seem to have turned the logic of organization and curation of such data” (Dornelas, 2018, p.89). In this context, concerning journalism, specifically, Dornelas (2018, p.85) highlights that “[...] the fragmentation of the audience; the incisive performance of the algorithms; and the possibility of customizing the information received” are also reflections of these changes. Information segmentation is not something new (Dornelas, 2018; Gillespie, 2018): news organized in editorials, supplements in printed notebook format, hot sites on portals are some examples. However, what we have nowadays is hyper-personalization (Dornelas, 2018) in the delivery of content.

Commonly associated with social networking sites, the algorithms also impact journalism, especially when vehicles take up space on these platforms that prioritize and feed on data and content from their users. Newsfeeds put codes that work in two ways: learning user preferences and delivering content and ads according to their profile. The volume of data is immense that the consequences of these logics went beyond the scope of the sites and reverberated in larger spheres, with social, economic, and political impacts worldwide. The responsibility share of these platforms, which insist on positioning their activity only in the field of technology and not in the media (Napoli & Caplan, 2018), led to information bubbles (Pariser, 2012; Recuero et al., 2017) and the growing spread of news with misinformation in these environments.

When integrating these spaces, which usually belong to companies in the GAFAM nucleus, the communication vehicles accept the terms and guidelines imposed by the platforms to distribute their content in these locations. At this point, the platform controls the content distributed since it passes precisely through algorithms and application rules, for example. If journalism is an activity that essentially aims for transparency in its modes of production, we have the opposite extreme with algorithms: opaque structures, properties of media, and technology platforms, which, many times, we not only pay to have access but we also continuously feed our personal data.

In a different perspective, Gillespie (2018) proposes a sociological analysis of the algorithms. The author deviates from understanding the codes and observes the human factor, observing these structures’ construction and maintenance. In this way, the theorist’s view encompasses a perspective of the algorithms’ effects, but considers that the relationship is an “interlacing”, of exchange:

the algorithms modify the dynamics of information consumption, but users also modify them.

This is especially true when the algorithm is the instrument of a business for whom the information it delivers (or the advertisements it pairs with it) is the commodity. If users fail or refuse to fit that tool into their practices, to make it meaningful, that algorithm will fail. This means we must consider not their “effect” on people, but a multidimensional “entanglement” between algorithms put into practice and the social tactics of users who take them up. This relationship is, of course, a moving target, because algorithms change, and the user populations and activities they encounter change as well. Still, this should not imply that there is no relationship. As these algorithms have nestled into people’s daily lives and mundane information practices, users shape and re-articulate the algorithms they encounter; and algorithms impinge on how people seek information, how they perceive and think about the contours of knowledge, and how they understand themselves in and through public discourse. (Gillespie, 2018, p.110).

In this sense, the concept of technogenesis (Hayles, 2012) can be applied since there is a mutual process of affection between humans and technology. Noll (2020) highlighted this coevolution, enhanced when dealing with voice assistants programmed for learning. Associating these views with Gillespie’s (2018) thinking, this process between humans and computational structures establishes other knowledge circulation and production dynamics. However, the fact is that, although people and their actions are still the primary sources for algorithms and their applications, we must not forget that the choices made by these structures are, ultimately, also made by the companies that manage them.

If, on the one hand, the platforms allow journalism to massively reach people, the information on access and user profile that the content produced impacts are retained on the platform. The companies that run the platforms share little or no data collected with the news media (Bell & Owen, 2017) since this information is fundamental to their functioning (Bustos & Castillo, 2019). Thus, once again, newspaper companies distribute their content in this environment controlled by third party companies.

GAFAM maintains its hegemony in the information market, preventing, whenever possible, the entry of new competitors. Thus, newsroom professionals cannot compete with core companies to create their platform to have complete autonomy of information (mainly Big Data) and advertising revenue. This forced adaptation to an external platform transforms how journalistic information is produced, which alters journalism as a whole (Bell & Owen, 2017).

This remodeling is notable when voice interfaces with embedded systems with artificial intelligence start to be part of people's routine. Within GAFAM, we rescue products and devices that relate to journalism and software from personal digital assistants (Table 1). All companies have specific products and services for this scenario: news that can be accessed by voice through personal assistants and chatbots embedded in smart speakers, as well as information on any topic that is of interest to users that are offered from algorithmic customization based on the searches of consumers themselves on Gafam platforms.

**Table 1** – GAFAM's products

			Google	Apple	Facebook	Amazon	Microsoft
<b>Infrastructures</b>	IoT	Voice-activated/virtual assistant, chatbots, Smart speakers	Google Home, Google Assistant	Siri, HomePod	M (2015), Messenger, Bots (2016)	Echo Alexa, Amazon Lex	Cortana, Bot Framework, Tay, Zo, Ruuh, etc.
<b>Digital Media</b>	Big Data	News	Google News, Google AMP	Apple News	NewsFee, Instant Articles	-	Linked-In

Source: made from the one developed by Bustos and Castillo (2019).

Behind the consumption of news or specific information through these companies' platforms is the construction of a complex socio-technical network that brings together an algorithm and a fundamental point of artificial intelligence: machine learning. These aspects caused a silent revolution in the field of social communication and journalism. When machines are responsible for learning human behavior and the possibility of hearing and speaking, it changes the field observed. Thus, what we seek, therefore, is to understand what is accessed, chosen, and delivered to the user and how voice assistants perform these actions with embedded personal digital assistants. As work limitations, at first, we aim to study the vocal transporters produced by two companies from the GAFAM nucleus: Google (Google Nest Home and Google Assistant) and Amazon (Echo Dot and Alexa).

It is important to note that these speech recognition artifacts and software were not produced exclusively to create or reproduce journalistic information. This aspect/functionality is just one of the Skills/ Actions accessed through the voice assistants. Although they

are meta-interfaces that work with communication and information, these characteristics do not always favor the treatment of information as journalistic or news content. Thus, it is the person who interacts with vocal transporters who determines what type of content or what uses and appropriations he will make of the artifact and his onboard assistant. If this person requests information about weather, traffic, or the global economy, it is the platforms that direct the sources of these contents, not leaving this selection option to the user.

We observe a game between people, interfaces, technology companies, developers, and news companies that vary according to individual interests (what the person wants to consume) and collective interests (what the companies/developers want to offer). As noted by Noll (2020), in qualitative research on the topic, it is possible to see that the news function could be further explored among those who have vocal transporters. The factor that usually determines the purchase of this type of artifact, taking smart speakers into account, is usually interested in making the home more “smart” and connected. Over time, other functions are more recurrent such as timers, alarms, reminders, lists, weather, and music playback. These indications presented by the author point to the current stage of the journalistic segment associated with voice interfaces that function more as a kind of quick entry of short information than of elaborate, critical, and complex news content.

#### **4 Vocal transactors in the metainterface industry**

Smart speakers with embedded personal digital assistants are called by Cayley (2017) vocal transactors, for doing a series of operations on behalf of people and people who have one or more models at home. The emergence of this type of technology is part of a set of propositions organized and consolidated by technology companies such as those of the GAFAM nucleus, which operate in a computing regime, called by Cayley (2017) Big Software.

In this sense, these companies act as Big Software architects, build systems, networks, artifacts, software, and others, following a logic that datafies a human life, from consumption habits to speech patterns. Voice assistants are another member of this modern computational web made up of data and information flows. These vocal transactors are inserted in an interface culture that can disappear

amid everyday human practices. These new interfaces are titled by Andersen and Pold (2018) as metainterface, for having a pervasive character, in addition to an increasingly “invisible” presence.

The metainterface has a different production type, as “it incorporates a signal-computer interface that quantifies and datifies, and ultimately turns the whole world into an interface” (Andersen & Pold, 2018). In this way, vocal transactors can be considered part of this metainterface industry, whose digital form implies in hardware and software, in addition to a capacity of action that can cause transformations in the forms of human expression and, in the case of the present study, in the way the journalism can be created, distributed and consumed.

In this cultural industry managed by large technology companies, layers of software are placed on all types of objects, which work from a series of programmable actions and those that are learned by the machine through living with humans and collecting data available on the internet. Vocal transactors like Google Home/Google Assistant, and Echo Dot/Alexa, therefore, have one:

[...] grammar and form of proper designation, an aural machine that transforms audio into text and text into machine code (binary). In the interaction of people with the vocal transactors and it with a network, there is the process of textual, aural, and code inscription that runs through an invisible system and, often, incomprehensible to its interagents, such as sensors, connectors, chips, boards, devices of location, among others. (Noll, 2020, p.110).

Thus, these devices combine services offered by companies Google and Amazon in a tangible physical form consisting of a speaker with integrated speakers, microphones, LED lights, and buttons to turn on, turn off, and mute (the models worked on in this article doesn't have a screen<sup>1</sup>). Internally, the artifacts are made up of a logic board and circuits that control all of its operations.

Both vocal transactors are evoked by passwords like “Ok Google”, “Hey Google” (Google Home), “Alexa”, “Echo” and “Amazon” (Echo Dot). Personal digital assistants need to be configured through Android or iOS operating systems such as smartphones and tablets to operate. From this, it is possible to link and control other objects with IoT and digital artifacts and media content and video and music streaming, among other options divided into categories such as questions and answers, automation, entertainment, and task management.

Another option is to personalize the assistant's voice, configure the locations most frequented by the user, make the system recognize each interlocutor who interacts with it, and choose the language with which it is possible to communicate with the assistant. However, this study's essential personalization is related to the news that each interactor will listen to. In this configuration, the available news sources are listed, and the interactor chooses those that interest him.

All these contents requested by the interactors are triggered, in each conversation, through the search by the vocal transactors for Actions (Google) and Skills (Amazon) pre-programmed to carry out the requested operation. These transactions occur with the aid of automated speech recognition systems (Automated Speech Recognition – ASR) and from cloud to cloud, being linked to other services offered by the companies, partners, and developers themselves.

## **5 Understanding journalistic flow in the cloud**

This process of transposition of the traditional news narrative to another that involves the dialogue between humans and machines requires adapting the content to the structures of the companies involved and their programming routines. While both Google (Google Assistant, n.d.) and Amazon (Amazon Alexa, n.d.) have websites focused on disseminating knowledge, few reports are on developing journalistic products for vocal transactors.

Pase et al. (2019) report the experience of researching and developing an Action for Company Globo to present its content in the Google Assistant environment. In addition to experimenting with a new way of distributing news, the action was considered a strategic measure to position the digital market. This initiative was the embryo of its first action in this scenario, action *G1* in Elections (*G1*, 2018).

In the text, the authors indicate a significant concern not only the transformation of the text produced to the web to a basis for the vocal transactor but also to prevent the content from eventually presenting some news bias. Thus, the project developed in 2017 focused its approach on services and punctual information, such as research results and vote calculation. It was necessary to understand how the interface is evoked and what is the question asked, called in the coupling text. This combination, “Ok, Google + question” needs

to be understandable to the machine and understand the behavior of those who trigger. Thus, at first, regional expressions were not inserted into the routine.

This is not the case for producing news for someone else to read or a newsletter written for a voice interface to turn text into sound. There is a processing of human-made input instructions, machine analysis, and consequent construction of a block of information that will be read by the voice interface and must be understood by a human agent. (Pase et al., 2019, p.44).

Another difficulty was the possibility of an external application using personal and location information that Google has but does not allow external services. This simple limitation, for example, makes it difficult for a nationwide company to combine its information to present a local news story. Because the company that owns the assistant owns and uses such information, there is an advantage for the content produced by its applications and not by third parties. Understandably, this occurs as a measure of protection for users' privacy; however, it is necessary to understand this fact as a competitive differential.

In this sense, the authors observed two ways to work around the problem. The first would be to develop specific actions, such as one for news about Fluminense or another for Botafogo, for example, in football teams. The other was to guide the public to inform any particularities in the evocative rite.

For this purpose, the structure HITCH + VERB + NEWS + CONTEXT / SPECIFIC, which allows triggering the tool and granular instructions. You can also structure formal commands, such as going back to a specific point in a read block of information or even suspending the service. (Pase et al., 2019, p.45).

To implement the Action, the development team used the Dialogflow<sup>2</sup> service, also used for chatbots (Dialogflow, 2020). Thus, the defined content would be removed from information published on pages indexed in the RSS<sup>3</sup> protocol. In this way, a request to hear the latest news would require the vocal transactor to hear the question, search a list of registered keywords, and, from them, take information in specific feeds.

Despite being a critical report to understand the transformation of content producers and the strategies used, the article does not explain how the initial experience was implemented later by the company in its news production flow for integration with its publishing systems and the vocal transactors. The process was probably replicated with new

variations from the “news” block in the information’s request structure. Building a tree of possible questions within a predetermined universe such as elections is a challenge, but the correct mapping allows us to build dialogue by combining information in the company’s databases. Also, Action *G1* in Elections was compatible with Google Home (then the name of the model now known as Nest Home) and the Google app for smartphones and tablets.

This machine-oriented development with the ability to be translated from bits to text and audio, according to the standards (Google Assistant, n.d.), allows the content producer to explore the new artifact and reach the audience that already has its digital personal assistant service embedded in other artifacts. Thus, interactors who currently do not have an artifact from the Nest Home line will be familiar if they use the object in the future.

## 6 Methodological procedures for analysis

After the contextualization and observation of the internal processes of vocal transactors, the analysis of a contemporary phenomenon like this uses a combination of techniques. Given the impossibility of accessing the existing programming codes and routines on Google and Amazon servers, we used the combination of the multiple case study technique (Yin, 2001, 2018) with an exploration of the operation of voice interfaces from predefined evocations and the observation of the configuration possibilities present in their applications. According to the author, this strategy is valid when

Case studies are preferred when the relevant behaviors still cannot be manipulated and when the desire is to study some contemporary event or set of events (“contemporary” meaning a fluid rendition of the recent past and the present, not just the present). (Yin, 2018, p.43).

The work presented in this article adopts the exploration and use of digital artifacts as a force to triangulate evidence and put into practice the observations resulting from theoretical research. This will allow us to observe the participation of journalistic sources in the daily practices analyzed, validating, or not the perceptions derived from the study of the influence of the group of companies known as GAFAM in this new horizon of disseminating the journalistic information.

Thus, we divide practical exploration into two stages. The first one observes mobile apps that allow users to install and control voice transactors, while the other part of information evocations. The app's observation seeks to see if it is possible to view a list of News Skills/Actions and the identification of news-producing sources. The presence of non-traditional content producers will be investigated with renowned communication companies. Finally, possible sections of categories between time, traffic, and sports will be recorded.

Later, and without installing any Skills/Actions, Google Assistant and Alexa will be evoked from a simple question, "*What is the latest news?*". This is purposely generic to understand what the service presents as news. As a consequence, we will search for the possible identification of the content producer.

## 7 The news on Google Home and Echo Dot

Journalistic news can be heard on Google Home and Echo Dot through two actions taken together or separately. As highlighted, the first possibility is a pre-selection made in the Google Home and Amazon Alexa apps for news vehicles that the interactor would like to have as a source of information. The second action is to ask the assistant about the news of interest (questioning, for example, about a disease in a particular country) or asking for a specific field (requesting news about sports, culture, technology, etc.).

In the Google Home app, the news is considered a service, and the list of news sources is accessed in the homonymous item in the app, along with Actions "Voice and video call", "Shopping list", "Music", "Videos and photos", "Agenda", "Reminders", "Actions", and the Action "Explore" other services. In April 2020, there were 23 news sources for the Portuguese language, with 10 "featured issues", namely: *Boas Uol* (other good news every day), *Folha* (main news of *Folha de São Paulo* day), *CBN Reporter* (CBN Reporter audios), *Jovem Pan* – Direct from the Newsroom (news of the day), *O Globo* (main news of the day), *Uol Notícias* (the best of Uol content), *Giro Veja* (Giro Veja podcast), *Panorama CBN* (main news in less than half an hour), *Summary R7* (comments by Camila Busnello and Heródoto Barbeiro on the main news of the day) and *Estadão Notícias* (main facts of the day in Brazil and the world).

The second category of news is "technology" with information from TecMundo and Canaltech News. The first provides audios for the

program Today TecMundo, held from Monday to Friday – originally broadcast on YouTube. Canaltech brings news on the topic in general, interviews, analysis of smartphones and tablets, tips, tutorials, and information from apps. Then comes the “Sport” category, with news from the Mercado da Bola *Uol* and *SportBuzz* Summary day. “Culture and entertainment” is another type of information present, with news from *Caras Brasil*, which publishes a podcast daily with highlights from the world of entertainment and celebrities.

In the “Health” category, there are two options for news sources with specials about Coronavirus, *Jovem Pan Especial: Coronavirus* and *Boletim Uol Coronavirus*. In closing, there are options for “local events” with *Gaúcha ZH* (Rio Grande do Sul), *Litoral FM* (Espírito Santo), *Gazeta Online* (Espírito Santo), *CBN Vitória* (Espírito Santo), *Rádio Jornal* (Pernambuco) and *Boletim O Povo* (Ceará), where the main news of the day is broadcast with a focus on Brazil and the corresponding state.

Regarding the applications, both do not come with pre-selected news, and the interactor is responsible for choosing the news source options of your interest, as well, it is possible to edit the order of the content that comes first when the interactor speaks: “Ok Google, listen to news”, or “Alexa, read the news summary”. On Amazon Alexa, it is possible to find the Skill “Summaries of News” in the item “settings”, subtopic “Alexa Preferences”, the same locality where the Skills options are listed: “voice responses”, “Music”, “TV and video”, “Traffic”, “Sports”, “Calendar” and “Photos”.

Amazon does not, in the assistant app, divide news into categories as is done by Google. Thus, the interactor selects the options from a list with 133 results from listed sources. This list appears differently for each interactor, following criteria such as “Relevance”, “Average customer rating”, “Launch date”, and “Featured”. A Skill produced for news from the soccer club Grêmio called “Imortal Tricolor” is indexed alongside others like *G1* and *Repórter CBN*. In addition to a description, each Skill features a list of suggested voice commands, “Start by saying”.

It is interesting to observe that the Echo Dot model's box presents six Skills suggestions – Amazon Music, Philips Hue, Spotify, *UOL*, *CBN*, and *G1* – three of them focused on news. It is possible to activate several news skills, but most of it only operates from the command “Alexa, what is the news summary?” translating the expression “flash briefing” used in English. It is possible to choose

various Skills, but the assistant will present according to an order of preference defined in the application.

At Google Home, it initially seems that it is impossible to include more items in the list, however, the interactors can switch languages and select more possibilities from news sources, without items from the previous list being deleted. Thus, we observed that, within the applications, in Google Home, there is a bigger description about what type of information each news source will bring, either by a mini summary below the name of the source or by the division into categories. On the other hand, the Amazon Alexa app offers more options for news sources in Portuguese and allows the interactor to see the rating of each one through the average rating of customers.

Amazon separates “News Summaries” in general and news about “Sports” and “Traffic”. Despite having the first category, the information is generic, except when a specific Skill is installed. This seems to be slightly different from the North American scenario, for example, where the company has agreements with the main sports leagues to calculate statistics and process game data. As for “Traffic”, it is possible to define whether the information will be collected from the Apple Maps, Google Maps, or Waze service. Alexa’s control company does not have its service for this and is open to using others’ information, including competitors.

In the Google Home app, there is no isolated category for sport (the category information is found with the other news sources offered by the assistant) or traffic, as presented on Amazon Alexa. However, information about the traffic can be accessed from Google tools such as Google Maps, where the interactor can register home and work addresses in the item “Your addresses” and use this configuration to know how the traffic is doing on the route or for the assistant to start navigating to the location (this action must be performed on the smartphone).

It is possible to ask the assistant on Google Home how to get to a specific place from another address. In this case, it describes the distance and how long, on average, it will take to complete the route, depending on the kind of transport informed by the user. Additional information about bus stations and steps or meters to the location is also added during instructions.

Due to their nature, based on sound, the investigated vocal transactors allow questions to be asked directly to the assistant. In case we only ask about news, if there is no source of the interactor

preference registered in the applications, both warn that there is this configuration option, and Alexa suggests three source options, and from the choice of the interactor the audio starts playing. Google Assistant, on the other hand, presents the content from its list of sources that have information of the day, in chronological order of disclosure. While listening to the news, it is possible to change the source by asking: “*Ok Google, next*”.

In the experience of using Echo Dot and Google Home with Alexa and Google Assistant embedded, respectively, we found that the Skills / Actions for news present some problems. In the case of Echo Dot, the guidance for the use of the evocative “*Alexa, what is my news summary?*” guides many developers to produce short audio summaries, giving the impression of reusing content created for other platforms, the same occurs with Google Home, although there are indications of specific podcasts created by the sources, which demonstrates the concern in adapting its format to other platforms.

Sports data is often outdated and very punctual. It is understandable that at the time of this study, many events were suspended due to Covid-19, but the lack of depth in the management of information sources, as well as the lack of clarity about the origins of the data, seems to be a constant, except if specific Skills and Actions are used.

Voice navigation causes apologies from both assistants when the interactor asks where the news comes from after hearing information. With Alexa, this also occurs in traffic and sports requests. Understandably, there is already a choice by the public for a content producer in the logical process of development and this is informed at the beginning of the response. However, it is worth remembering that a news item can be composed by several sources, such as own, institutional reports, or distributed by agencies, for example, something important in the journalistic process and which is discarded in the assistant’s operation (although it appears in the newsletters).

Traffic questions receive standard answers, with a description of the recommended route and the estimated time to reach the destination. It is a presentation only listed on routes, without visual aspects, but the personalization component, with the knowledge about the points “home” and “work” offers a personalized experience different from traditional mass media. In a scenario of media companies replaces their street reporters with automated information from services, the studied of vocal transactors reinforce

their interactor's act of counting on it to plan their displacement and, little by little, abandon the sources of information from the past.

Regarding GAFAM, something that stands out in the use and interaction with Google and Amazon's vocal transactors is the perception that more important than the transmission of quality news content, is the dissemination of small information of any nature, chosen according to the interest of the interactors. What worries in this scenario is precisely the source of these contents. When asking Alexa about Brazil's population, for example, the answer will be: "according to the latest data from 2017, the population of Brazil is 207 million people", while Google Assistant replies: "the population of Brazil was 209.469.333 million in 2018". None of the assistants divulge the source of the information or present data for 2020, by voice. However, when accessing the content recorded by the assistant, in the settings, it is possible to identify where the information came from.

However, suppose the interactor is aware that it is the Instituto Brasileiro de Geografia e Estatística (IBGE) that makes this count. In that case, it is possible to request the latest data released by IBGE, information that is provided more completely and with a high degree of reliability. In this sense, the interactors must learn how to ask questions to the vocal transactors, so that the requested information is answered satisfactorily, which refers to the concept of technogenesis, previously discussed.

Therefore, we infer that GAFAM's nucleus companies, through their vocal transactors, act as a type of fast information deliverers, competing directly with newspaper companies. The amount of data is offered as services, but they must be seen as essential components for the construction of news content that would need a broader context to be fully understood.

GAFAM uses tracking and personalization, entering the algorithmic function to optimize data and offer "informational pinches", however, it fails in something essential and vital for journalism: criteria and news-values. Besides, because vocal transactors were not built specifically for news content, finding specific Skills/Actions in applications can be left in the background for some interactors, more interested in finding results quickly than in more complex information.

Vocal transactors, due to their recent (and in process) incorporation into the daily routine of a still small part of the population,

can be considered as new components for the placement of content, however, it is essential to emphasize that, due to its nature, it brings together several industries within of one, gathering communication, music, commerce, news, among others. This is not just a transposition of services; it is more of a node in an extensive network of services that can be used for the same purposes as journalism.

In the current stage of development, the vocal transactors analyzed to show the agency of the Google and Amazon companies, in the case analyzed here (but which can be expanded to other nucleus companies), concerning the application of artificial intelligence when it comes to short information offered by native Skills/Actions. However, as news content, it acts more in a kind of regulation of formats and modes of producing the content conveyed in vocal transactors.

Applications and Skills/Actions can use this algorithmic processing, something that Google and Amazon take advantage of to talk about traffic or weather, for example, however, as external developers, we have no way to access the data extracted by the artificial intelligence of these companies, something that already puts newspaper companies at a technical disadvantage. In this sense, from the analysis and use of vocal transactors, we infer that companies encourage the creation of content for the use of their structures, but this access and use is limited to what they are proposing, which ends up restricting the production of content to the reproduction of podcasts or news summaries, without the customization of actual news content.

## **8 Final considerations**

The digital transformation presents scenarios under construction, especially for journalism. While the internet and other technologies allow different experiences from those observed a few decades earlier, such as the visualization of virtual reality environments, the development of this depends on new initiatives. The past investment in presses and structures of capture and transmission of video currently has another pace. As observed in the study of vocal transactors, it is necessary to understand the possibilities of using data processing on a large scale, using artificial intelligence routines, the development of algorithms for content management, the possibility of producing hardware, and the scope for experimentation. Even though it is a fundamental piece,

the content is apparently placed as an element inserted by other companies interested in participating in these marketplaces. As in the smartphones and tablets application stores, the GAFAM core companies understand that they have a contemporary power that challenges other institutions known to the public for longer.

Google and Amazon, representatives of the group studied in this research, expand their domains by controlling hardware and software and conditioning the ways to present journalistic content in their environments and artifacts. These devices fascinate by their tone as a science fiction object, by the internet's materialization in a kind of intelligent butler, and by presenting an easy way to obtain personalized content using only the voice. To serve better, they track behavior while providing data for their companies to optimize the product offering. Journalism is placed as another item in this gallery of access possibilities, and, in the name of presence in these spaces, it ends up subjected to the rules of companies that do not reveal local contexts and scenarios.

This is a process that operates in a way that is not so well known to the public. As observed in moments of dialogue with assistants, there is an initial choice of sources of information, but it is not possible to understand data on the construction of news at other levels. The adoption of applications and their intense production pace seldom make room for this vital news-building space. This movement is further intensified with voice meta-interfaces. Even presenting the bulletins recorded by professionals, we do not observe them because it is a stronger voice, native to the artifact, that presents and guides us to execute these contents.

Even the media outlets in Google Assistant and Alexa do not explain their routines; they only present the context to their audience and show that "they are also there". Thus, in addition to informing, the journalist contributes to forming the public's understanding of these transformations by producing and distributing news on vocal transactors. Nonetheless, what we perceive with the experiment is this distribution format is still in the elaboration phase, which is evidenced by the lack of a standard, which makes news outlets produce radio news bulletins for vocal transactors or podcasts.

Besides, interfaces became to offer information personalized and captured directly by sensors and programs, as in traffic. Cameras and reporters in specific points of the cities are massive and inform about the city's main spaces, which is essential for understanding the

pace of the urban environment, but the direct connection with traffic applications and services like Waze demands a transformation of this traditional service. The phenomenon can be observed in the future in sports, when Amazon, for example, processes information captured during games to offer directly through Alexa.

There is an essential point in the approach of journalism in these spaces. The information of a company available in an Action or Skill must be chosen and activated, while native services offered by GAFAM do not demand this process. It is possible to observe a high competitive advantage of Silicon Valley companies before vehicles that wish to participate in this scenario.

Observing the presence of content produced in Portuguese, another point corroborates this issue. During the test sessions, no content was found for purchase through the dialogue, as in-depth news after reading it in a summarized format. If, on the one hand, it is necessary to understand the strategy of being present in the environments and retaining the public to later profit from this operation, there is an interesting gap that can be filled by GAFAM itself before the newsrooms. This is understandable in a scenario of financial difficulties and scarce resources that are often used to maintain traditional operations, but it is necessary to experiment, even before others do.

The algorithms are put into practice in a kind of “invisibility mode” learning preferences and delivering content according to the user’s profile. For the machine, it is the task of personalizing the human choice or suggesting this configuration. Thus, the consuming public also helps the system’s logic, maintaining the structure presented through the algorithms. Here, the vocal transactors indicate a scenario that confuses skills common to radio due to voice and computing. In this way, media and professionals adapt, because they need to be present on the platforms, however, they fail in terms of innovation, which once again returns to the hands of GAFAM.

Voice assistants are associated with Amazon and Google but are not exclusive products of them. Alternatives with the Mycroft project (Mycroft, n.d.) allow developing similar systems using inexpensive products, such as the Raspberry Pi. Unlike the systems studied here, its use requires the construction of routines and other digital processes, but it is a challenge that can be interesting for medium-sized media outlets. Even with logistical issues (production, sales, and support) involved, there is room to test new ways of delivering content.

The challenge that vocal transactors present to journalism is gradually understood. The content appears like a mixture of algorithmic work with people's effort, both in the investigation and in the development of dialogues between humans and machines. Even though resistance appears to be a process that is too costly for the budgets of institutions, this process is necessary to understand the changes in journalism precisely.

Likewise, the relationship between personal digital assistants voice, artifacts, and journalism go on the establishment and constant observation this text also found precisely in this context its limitations – also emphasized by the opacity and an absolute lack of information on the systems' operation and their equipment. However, although it is relevant to the registration and investigation of how the journalistic production has been formatted and distributed in these environments in early character.

## NOTES

- 1 Other models like Echo Show (Amazon) and Nest Hub (Google) have screens.
- 2 Dialogflow is a developer of Google's natural language-based human-computer interaction technologies that use machine learning to understand the purpose of the request and the context of what the user speaks to respond more effectively.
- 3 RSS feeds are a simplified way to receive content on the internet in real-time. The technology allows the usage of RSS feeds to receive constant updates on websites or other fluxes.

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