COMMUNICATION & SOCIETY

Ainara Larrondo Ureta
https://orcid.org/0000-0003-3303-4330
ainara.larrondo@ehu.eus
Euskal Herriko Unibertsitatea

Eva María Ferreras Rodríguez
https://orcid.org/0000-0002-8604-034X
eva.ferreras@gmail.com
Euskal Herriko Unibertsitatea

The potential of investigative data journalism to reshape professional culture and values. A study of bellwether transnational projects

Abstract

This article offers a specialized view of investigative data journalism based on a study of recent initiatives that resulted from transnational cooperation involving different journalistic agents and institutions. The initiatives in question are The Migrant Files (2014), NarcoData (2015), Medicamentalia (2015-2018), Panama Papers (2016), Football Leaks (2016) and Investiga Lava Jato (2017). These products are analysed according to the main approach used in research in this field, which focuses on their content and characteristics as well as on the professional implications and difficulties involved. The conclusions suggest that the complexity and effort required for this type of product can be worthwhile in order to recover the principles of journalism and to renew and enrich the role of journalists, based on their collaboration with other professionals.

1. Data journalism: definition and research

Big data is a social, cultural and technological phenomenon resulting from the exponential growth of digital data and information. It is recognized that the practices associated with it have positive consequences for democracy and society (Lewis & Westlund, 2016, p. 447). These consequences can be examined on the basis of the relationship between big data and journalism, a phenomenon that is widely known today by the term "data journalism."

Although data journalism invites reflection and speculation on the future of work in newsrooms and the wider profession of journalism, the first conceptual developments related to it date back approximately ten years and point to a model closely linked to two well-known journalistic practices: infography and computer-assisted reporting (CAR), tied to the use of computational technologies in newsrooms (Knight, 2015, p. 56). In the words of De Maeyer *et al.* (2015, p. 432), an analysis of the definitions that have emerged to date shows the term's two-fold meaning: it can involve a more or less technological approach focusing on the data, or a more journalistic approach. This is important when it comes to evaluating the journalistic scope and professional implications of this type of product, which is precisely what this article sets out to do.

The literature on data journalism has grown exponentially in the last decade, and it has become one of the preferred tendencies in current research on communication (De Maeyer *et al.*, 2015; Loosen, Reimer & De Silva-Schmidt, 2020; Lynn, Hermida & Fulda, 2018;

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Ausserhofer *et al.* 2020; etc.). In this context of great investigative enthusiasm, analyses related to this topic echo the term's current polyphony in a more or less detailed way: "Data journalism is ultimately a deeply contested and simultaneously diffuse term" (Fink & Anderson, 2015, p. 468).

As a result, in the absence of a unified, consensual definition (Ausserhofer *et al.*, 2020), the tendency is to define data-driven journalistic products by stressing their value for transmitting information of considerable scope in an analytical, profound and exhaustive way, making use for this purpose of the combination of a great quantity of data and the graphic, visual and interactive presentation of that data (Rogers, 2011; Gray & Chambers, 2012; Howard, 2014; Knight, 2015; Adegboyega & Bahareh, 2018; Lynn, Hermida & Fulda, 2018; etc.). The lack of a shared interpretation has also resulted in scrutiny of how the term is viewed and defined in media companies (De Maeyer *et al.*, 2015).

With regard to the preferred theoretical frameworks and research designs with respect to data journalism, priority has been given specifically to the analysis of "the organizational culture, newsroom structures, the epistemologies of data journalists, and the characteristics of data-intensive pieces" (Ausserhofer *et al.*, 2020). Different studies have focused on the characteristics of data-driven products (Loosen, Reimer & De Silva-Schmidt, 2020), as well as on the professional aspect or the implications of this mode of journalistic practice in newsrooms (Royal, 2012; Karlsen & Stavelin, 2014; Bakker, 2014; Weber & Rall, 2012 and 2013; Weinacht & Spiller, 2014; Tabary, Provost & Trottier, 2016). There has also been analysis of the evolution of the data journalist's profile and the characteristics that define this category as a new professional specialisation requiring skills in programming, searching, verification and visualization, spreadsheets, database management and statistics (López García, Toural & Rodríguez, 2016).

Although there are some outstanding studies available on European audio-visual media (Appelgren & Nygren, 2014; Hannaford, 2015), analyses of data journalism carried out to date mainly examine the field of the western mass media from the perspective of the production work of newspaper companies. These studies are essentially based on the particular characteristics of geographical contexts like the United States (Garrison, 1999; Royal, 2012; Parasie & Dagiral, 2013; Fink & Anderson, 2015), Canada (Hermida & Lynn, 2017), United Kingdom (Knight, 2015; Borges-Rey, 2020), Germany and Switzerland (Weber & Rall, 2012 and 2013), Norway (Karlsen & Stavelin, 2014), Sweden (Nygren & Appelgren, 2013), the Netherlands (Smit, De Haan & Buijs, 2014), Finland (Uskali & Kuutti, 2015), Brazil (Zanchelli & Crucianelli, 2012), Argentina (Aitamurto *et al.*, 2011) and Belgium (De Maeyer *et al.*, 2015).

In relation to analyses focusing on the practice of data journalism, there have also been more critical or reflective views. The study of the national press in the United Kingdom by Knight (2015, p. 70) reveals the existence of a form of data journalism that is excessively superficial and institutional in both its form and content, lacks innovation and makes little use of the opportunity that this practice provides for reinventing genuine journalistic forms, such as investigative journalism.

In similar terms, Tabary, Provost & Trottier (2016: 81) indicate that the majority of products are limited to using automated visualization programmes to illustrate already-assembled public datasets without further analysis or changes. In relation to these findings, Lynn, Hermida & Fulda (2018: 128) warn that "data journalism cannot just be computer-assisted reporting with digital window dressing." De Maeyer *et al.* (2015, p. 434) also reflect on the need to employ other analytical perspectives when approaching the phenomenon, since the newsroom-centred perspective "falls short of accounting for all the actors potentially involved in the production of data journalism. Key actors outside of the newsrooms also play a role in the development of data journalism."

The literature on data journalism research is scarce, but authors like Ausserhofer *et al.* (2020) critically discuss the main gaps in the field and suggest the need for research covering

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data-intensive projects, as well as for generating new perspectives that integrate proven viewpoints, theories and methods (digital journalism, investigative journalism, ethics, audience engagement and interaction, etc.). In similar terms, as Appelgren, Lindén & van Dalen (2019) recognize, data journalism research has traditionally focused on a limited set of countries, primarily within the liberal and democratic corporate media systems. The issue of collaborative and interdisciplinary approaches (Lynn, Hermida & Fulda, 2018, p. 2) is still an under-researched field and there is a need for further study of intensive data journalism projects.

The analyses carried out to date both within organizations and at the national level have certainly proved useful for understanding the current meaning of data journalism and the characteristics and public implications of this practice. However, it seems necessary to throw light on the context, experience and implications for audiences of the bellwether international collaborative and investigative data journalism projects carried out so far, considering their growing importance in both theory and practice (Konow-Lund, Gearing & Berglez, 2019).

In view of that, this article considers the practice of data journalism involving inter-institutional collaborations and that can be framed within the canon of investigative journalism. One of the most outstanding characteristics that distinguishes data journalism from other fields of work within the profession is the aspect of cooperation both among different areas inside the same organization and among different organizations (Hermida & Lynn, 2017, p. 166). Teamwork involving media companies and organizations in different countries, with a view to creating databases of information, is becoming increasingly normal and many examples can be found today. For example, the work of Fink & Anderson (2015, p. 471) makes clear that connections exist between journalists and bodies outside the media organizations they work for, as in the case of the IRE (Investigative Reporters and Editors) organization.

Even so, what is still missing is a categorization of this type of project and, in general, more information on this type of cooperation, hence the interest of this article in throwing some light on this tendency's possibilities.

This study therefore aims to contribute to the current analysis of the short and medium-term significance, usefulness and implications of data-driven investigative and cooperative journalism across borders, due to its value for the present and future practice of the profession at the global level. Furthermore, the aim of this piece of research is to advance beyond an analysis of the state of data journalism in a specific country or within organizations, and to begin to explore the full possibilities of its development –including the inter-institutional collaboration aspect– in order to understand how this field is also shaped by different clusters in contiguous spaces. That is why the approach employed in this study focuses on analysing representative cases that stand out due to their quality and innovation, and that consequently serve to indicate, and make it possible to examine, the path that data journalism will follow in the short and medium term.

As a starting hypothesis, the study points to the existence of unexplored activities in addition to those covered by today's academic literature (Center for Cooperative Media, 2017; Sambrook, 2018). Specifically, these activities are intermediate ones involving the possibility of sharing resources at the organizational level and, at the same time, the possibility of carrying out co-creation actions.

In view of that stated above, this study considered three main research questions:

Q1. what are the distinctive characteristics of data journalism projects when they are coordinated by different types of journalistic organizations (International Consortium of Investigative Journalism, Civio, Journalism++, European Investigative Collaborations) and independent media companies (Animal Político, Convoca, Folha de S. Paulo)?

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In this regard, the study inquires about the following characterizing elements: models of collaborative journalism, coordination and the role of the intermediary, and elements that materialize in the practice of such collaboration (sources and tools, professional teams and funding). Based on this first research question, the study also tried to determine whether these products can be fitted into the categories described by the academic literature or whether they imply new categories that must be taken into account in the practice and study of data journalism.

Q2. what are the main challenges or difficulties related to these journalistic projects?

Q3. to what extent do these products contribute to investigative reporting and the democratic function of journalism?

2. The scope of investigative and collaborative data journalism

Data journalism products mainly draw on information proceeding from official sources, principally institutional or governmental ones, which is why it does not necessarily fit into the category of so-called "investigative journalism." Even so, authors like Marjorie Grassler (2017) connect the origin of data journalism to so-called precision journalism, whose techniques are close to those of investigative journalism. In this way she shows that data journalism influences public decision-making processes, as well as processes of rebuilding trust between citizens and the authorities.

There is no doubt that investigative journalism using data is one of the paths with the greatest future projection in today's media ecosystem (López, Toural & Rodríguez, 2016, p. 287). A growing number of data journalism products can be placed under the category of investigative journalism. In this context, the empirical study by Lynn, Hermida & Fulda (2018) draws attention to the lack of transparency when it comes to making the source data known to the audience. The analysis by Anderson (2013) recognizes the importance of examining the "bureaucratic, policy-level initiatives that either allow computational journalism to thrive, or retard its growth."

The study by De Maeyer *et al.* (2015, p. 440) suggests that data journalism products stand out due to their potential to renew the promise of objectivity and to improve journalism, as they make it possible to show what is hidden, as journalism has always done, to "bring governments to their knees" and "gain independence from official channels." Likewise, the work by Parasie (2014, p. 364) reveals that the design of "data-processing artefacts can match the traditional epistemology of journalistic investigation, but only with great efforts and resources from the organization […] a growing number of journalists and programmers see data-processing tools as appropriate means to uncover officials' wrongdoings, social inequities, or environmental issues."

In their recent report, Ellen Hume & Susan Abbot (2017) note that there is a growing interest in investigative journalism, and especially collaborative cross-border investigative journalism. One example of this growing tendency is the creation of the Global Investigative Journalism Network (GIJN), made up of the Center for Investigative Reporting, Investigative Reporters and Editors (IRE) and the International Consortium of Investigative Journalism (ICIJ), amongst other internationally important organizations in the field of investigative journalism. In this respect, journalistic work based on the data contained in the "Panama Papers" has become a prototypical example of the advantages of this collaborative model in the field of explanatory reporting and data journalism, one that resulted from the work of international groups dedicated to doing research and recovering the "powerful watchdog impact on public life" (Hume & Abbot, 2017).

Only a few years ago, journalism partnerships were recognized as one of the defining elements of a priority tendency and even of a new age in journalism (Edmonds & Mitchell, 2014; Hamilton, 2015). In addition, the recent report "Comparing models of collaborative journalism" shows that "a clear majority of the finite collaborative projects currently being

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practiced are investigative or accountability stories" (Center for Cooperative Media, 2017, p. 17). According to the same study, "collaborative journalism has evolved from experiment to common practice" and it is "being practiced on a scale that constitutes a revolution in journalism" (Center for Cooperative Media, 2017, pp. 17-19). According to the recent description provided by Alfter (2019), the process-oriented definition of cross-border journalism considers the work of journalists from different countries who cooperate on a shared theme or story and compile, mutually cross-check and ultimately merge their findings in order to individually fact-check and publish these findings adjusted to their national, local or otherwise specialised target groups.

In practice, these global collaborative practices give a new boost to investigative journalism and the traditional role of journalistic organizations as monitors of the public authorities: "With the disruption of Internet and technologies, publishers can influence broader audiences, which can help them to achieve their realm, as a Fourth Estate. The news media serves as a civil watchdog [...]. Therefore, investigative reporting is not only one genre of this fourth power but also an evident tool to enlighten people and give means to people to strengthen their critical thinking" (De Lima Santos, González-Tosat & Salaverría, 2019, p. 381).

In this regard, investigative data and international collaborative journalism shows clear implications for audiences, whose role also changes. Not only are they no longer passive consumers, but they also contribute to investigations, increasing their level of interest and involvement. Baack (2018) calls these audiences "civil tech" and analyses their practices of collaboration with journalists, while other authors describe them as hacktivists, characterizing them as readerships that "aim to facilitate the connection between journalists and digital sources, while also prioritizing the security and anonymity of these sources" (Sampedro, 2016). This is an important profile, bearing in mind that many collaborative projects, such as the ones examined in this article, originate in leaks from the public.

3. Methodology

This study uses a qualitative methodology to examine a total of six transnational projects, all of considerable scope and international importance, that received prizes at recent Data Journalism Awards and were coordinated by either organizations or mass media: The Migrant Files (2014), NarcoData (2015), Medicamentalia (2015-2018), Panama Papers (2016), Football Leaks (2016) and Investiga Lava Jato (2017). The following is a brief description of each of the cases analysed with an explanation of why these products are suitable for indicating the tendency and clarifying the direction that will be followed in coming years by investigative journalism based on massive data use.

The Migrant Files (2014) was a journalistic project whose subject was immigration to Europe. It was a denunciation of the number of immigrants –children, women and men– who had died attempting to reach Europe. It was coordinated by Journalism++, an international data journalism organization with offices in Stockholm and Oporto. The following also collaborated on the project: Dataninja, Neue Zürcher Zeitung, El Confidencial, Sydsvenskan and Radiobubble, as well as the freelance journalists Jean-Marc Manach and Jacopo Ottaviani. The Migrant Files won the 2015 Data Journalism Award in the Data Stories on a Single Topic category.

NarcoData (2015) explained the evolution of the drug cartels, their influence and their criminal cells. This project was created by the independent Mexican digital publisher Animal Político (2010) and the Chilean collaborative journalism platform Poderopedia.

Medicamentalia (2015, 2017, 2018) is an international project covering global access to health, set up by the independent organization Civio. It consisted of three parts: Prices of medicines (2015), Immunization and prices of vaccines (2017) and, finally, Contraception, published over the course of 2018. It was published in media outlets such as EuroNews, El Mundo (Spain), La Sexta TV (Spain), Correct!v, EuroScientist, Il Sole 24 Ore, La Nación and

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Knack Magazine, amongst others. Civio was responsible for collecting and processing the data, and for elaborating the reports that were later published by its "partners." Medicamentalia has received several international prizes: the 2016 Gabriel García Márquez Journalism Award for Innovation and the 2016 Data Journalism Award for the Investigation of the Year (Small Newsroom).

Panama Papers (2016) exposed how companies, politicians and various world-famous personalities concealed their profits and assets in tax havens in order to avoid paying taxes. This project was elaborated with data from a massive leak consisting of 11.5 million files (2.6 terabytes of information), proceeding from the Mossack Fonseca lawyers' office. According to the International Consortium of Investigative Journalism (ICIJ), the document was sent to the German newspaper Süddeutsche Zeitung and its journalists shared it with the ICIJ, which coordinated the project. The first batch of information appeared simultaneously on 3 April 2016 in 109 media in 76 different countries, including The Guardian and the BBC (United Kingdom), El Confidencial and La Sexta TV (Spain), La Nación (Argentina), Le Monde (France), El Universal and El Comercio (Ecuador), The New York Times and The Washington Post (USA), and others. This project received the Award for the Investigation of the Year (Large Newsroom) at the 2016 Data Journalism Awards, as well as the 2017 Pulitzer Prize for Explanatory Reporting.

Football Leaks (2016) uncovered confidential agreements from the football world on footballers' contracts, tax fraud, corruption at clubs, illegal bonuses, etc. All the media companies involved published the first batch of information on 3 December 2016. In the spring of 2016 the Football Leaks website, which had already published contracts between football teams and players, passed over 18.6 million documents to a journalist working for the German publication Der Spiegel. Once these had been verified, the media network European Investigative Collaborations (EIC) took charge of coordinating this project. Together with Der Spiegel, this network includes media like Mediapart (France), The Sunday Times (United Kingdom), Expresso (Portugal), El Mundo (Spain), L'Espresso (Italy), Le Soir (Belgium), NRC Handelsblad (Netherlands) and The Black Sea, a digital journal created by the Rumanian Center for Investigative Journalism. In 2017 it was shortlisted for the Data Journalism Award in the Investigation of the Year category.

Investiga Lava Jato (2017) was a collaborative project involving over twenty Latin American and African journalists who investigated the network of corruption connected to Brazilian construction companies. The project was coordinated by Convoca, the digital investigative journalism media company based in Peru, and the Brazilian newspaper Folha de S. Paulo. Other media companies took part, such as Perfil (Argentina), El Faro (El Salvador), Plaza Pública (Guatemala), the investigative portal Mil Hojas from Ecuador, as well as journalists and data analysts from Colombiacheck and Consejo de Redacción de Colombia y Panamá. Also collaborating were the Iniciativa Regional para el Periodismo de Investigación en las Américas de ICFJ/Connectas, the Venezuelan websites Runrunes and El Pitazo and the Jornal Verdade de Moçambique. In 2018 it received the TRACE Prize for Investigative Reporting on corruption, as well as the 2018 prize for Journalistic Excellence, awarded by the Sociedad Interamericana de Prensa (SIP), in the Data Journalism category. In 2018 Investiga Lava Jato was also a finalist for the Data Journalism Awards, in the Innovation in Data Journalism category.

Three variables were used to determine the characteristics of these cases. They were designed on the basis of the information contained in two recent reports: Models of Collaborative Journalism (Center for Cooperative Media, 2017) and Collaborative Journalism (Sambrook, 2018): 1) Model or type of journalistic collaboration to which they belong; 2) Role of the intermediary (analysis of the functions of editorial coordination and publication strategies); and 3) Main elements of the collaboration: resources (sources), funding, technology and professional profiles.

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The impossibility of objectively quantifying variables like trust and confidentiality meant that both elements had to be excluded from the analysis, despite the fact they were mentioned in the two reports referred to above.

The Center for Cooperative Media (2017, p. 21) identifies a total of six models of collaborative journalism according to interdependent variables like type of execution (separate or joint), duration of the project (temporary/finite or ongoing) and level of integration: when partners create content separately and share it, the possibilities are "Temporary and Separate" and "Ongoing and Separate"; when partners work together to create content the possibilities are "Temporary and Co-creating" and "Ongoing and Co-creating." Finally, when partners share content/data/resources at the organizational level, the options are "Temporary and Integrated" and "Ongoing and Integrated."

The report notes that cooperation can have a more or less temporary character or last for a longer period of time, and can involve a more or less independent execution: creating content separately implies a low level of integration and requires a relatively low level of commitment, while collaboration in which partners integrate their operations at the organizational level –sharing resources, for example– requires a high level of commitment. According to the study's main hypothesis, in addition to the possibilities described there are additional ones that introduce new parameters in the categorization currently accepted in the academic literature.

Data for the descriptive analysis of the projects was collected using four digital questionnaires and two phone surveys (Investiga Lava Jato and NarcoData), conducted between the months of March and September 2018 (Table 1). Questionnaires have proved to be an efficient method for analysing data journalism (Appelgren & Nygren, 2014a and 2014b). These surveys aimed to obtain analytical data relating to the role of the intermediary and the main elements of the collaboration. Specifically, the questionnaire for this study considered questions about the professional profiles involved, the main functions of the intermediary, publication strategies, funding and the tools employed. Furthermore, the coordinators were asked to evaluate the factors that facilitate or hinder this kind of cross-border initiative and also about the process of holding public authorities to account. This made it possible to determine the way in which the products examined were shaped by the viewpoints and opinions of the professionals in charge.

Table 1: Role and professional profile of the interviewees in each project.

Panama Papers	Marcos García Rey, member of the ICIJ and one of the intermediate coordinators of the project
The Migrant Files	Nicolas Kayser-Bril, coordinator of The Migrant Files and founder of Journalism ++
Medicamentalia	Javier de Vega, investigator-editor at Civio and responsible for the organization's communications
Football Leaks	Stefan Candea, founder of EIC and one of the coordinators of the project
Investiga Lava Jato	Milagros Salazar, director of Convoca, one of the media organizations that coordinated this project
NarcoData	Yosune Chamizo, editor of Animal Político

Source: Own elaboration.

4. Results

4.1. *Models of Collaborative Journalism*

The projects Panama Papers and Football Leaks can be categorized in the "Temporary and Integrated" model. This involves collaboration for the time that the project lasts, during which the organizations share resources, data, tools and the software that is created *ad hoc*, although

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each organization creates its own stories from the same data according to the interests of its area of influence.

In both cases, all the participants had access to the same data and software. That is, all the media organizations involved in the two projects worked with the same database, which housed the leaks and the same tools. Thus, for example, in both projects tools were designed that enabled secure network communication amongst all those taking part. With respect to the publication of the material, each medium elaborated, published and publicised the information related to its country.

The Migrant Files and NarcoData are projects that can be categorized as belonging to the "Temporary and Co-creating" model. All those involved in the two projects generated content and later shared it for publication, whether on a website, on a platform created for that purpose, or via some other medium. In this case there is no "external" editorial work and it is the "partners" themselves that establish the norms to follow, the division of work and the publication policy. In these two cases there is a website where the results of the two investigations were published. For example, some pieces from The Migrant Files were published in the Spanish digital publication Elconfidencial.com.

Unlike the other projects studied, Investiga Lava Jato is framed within two different models. Initially, this project was developed independently by several media organizations that later shared information. Having found that the information affected different Latin American countries, several organizations and journalists decided to unite and create a collaborative platform, following which this project can be classified under the "Temporary and Integrated" model. From that point onwards Convoca and Folha do S. Paulo assumed responsibility for the work of coordination.

Medicamentalia, on the other hand, falls into a different model of collaboration. As mentioned above, Civio, a non-profit organization, took responsibility from beginning to end, seeking, collecting and processing all the data content necessary for the journalistic project. Different media organizations and journalists were recruited for this process involving access to Civio's databases and already edited materials, so that they could create their own pieces, or simply use those materials directly for publication.

4.2. *Coordination and the role of the intermediary*

All the cases studied involved coordination work, although this took different forms. Two of the cases studied, Panama Papers and Football Leaks, were coordinated by "external" institutions, the ICIJ and the EIC, respectively. In The Migrant Files, NarcoData and Investiga Lava Jato cases, this work was performed by one of the participants in the investigation. Medicamentalia was coordinated by the non-profit organization Civio.

The work of coordination is essential for guaranteeing success, since the projects involve investigations that take place over several months, involve many media companies and organizations, and the collaboration of dozens of professionals. Each project can involve one or more principal coordinators. Below is a list of the coordinators appointed in each organization (Table 2).

Table 2: Project coordinators.

Project	Coordinators
The Migrant Files	Journalism ++: Nicolas Kayser-Bril
NarcoData	Animal Político: Yosune Chamizo
Medicamentalia	Civio: Eva Belmonte
Panama Papers	ICIJ: Marina Walker, Mar Cabra and others like García Rey
Football Leaks	EIC: Stefan Candea
Investiga Lava Jato	Convoca (Milagros Salazar) and Folha do S. Paulo (Flavio Ferreira)

Source: Own elaboration.

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One aspect worth underscoring is the coordination process that occurs in those cases where there is no external agent. In the case of Investiga Lava Jato, the part related to content was directed by the newspaper Folha do S. Paulo (Brazil) and the technical part by Convoca (Peru). The same happened in the case of NarcoData: Poderopedia set the technical standards and Animal Político directed the content part.

In spite of these differences, the professionals and coordinators involved in developing these products design and demarcate this coordination on the basis of the following attributes: design of editorial policy, selection of methodologies and tools, journalistic focus and energizing collaboration amongst the different media organizations or participants, motivating people and teams, in addition to detecting possible problems over the course of the whole process. As Marcos García Rey (Panama Papers) explains, the work of the coordinator of investigative projects involving data journalism and collaboration is "to search for and gather other sources aside from the initially available documents, establish the pieces for production, editing and fact-checking, and consult lawyers." Milagros Salazar (Convoca, Investiga Lava Jato) states that another of the coordinator's functions is "to provide technical help to those media organizations where access to information is not so easy, as in Venezuela or Angola."

With respect to designing editorial policy, it important to note that this not only refers to the specific pieces that form part of the project (visualizations, maps, applications), but also to possible publication dates. It seems logical that to achieve greater reach and impact the choice should be to simultaneously release the product and its news stories on different media outlets, although this is not always easy to attain. Javier de Vega (Civio, Medicamentalia) explains that the publication strategy "is agreed upon according to the deadlines and priorities of each party." The same approach was used at Investiga Lava Jato; in the words of its coordinator, Milagros Salazar: "We have an agreement about when we are going to publish the information, and we have to understand the context of each country to establish a methodology for work and publication."

Even so, it is not always easy to reach agreement and this is one of the issues that generate the most tension in these cross-border projects: "We knew that most of the tension would be related to the publication chronogram. This involves many arguments and compromises on all sides. It is necessary to keep in mind the logistics of each of the partners, some of whom publish on different days, others have a paywall..." (Stefan Candea, Football Leaks).

Marcos García Rey (Panama Papers) explains that all the media organizations taking part in the investigation had signed a prior commitment to publish when the investigation was concluded. Logically, each organization has its own communication plan and the interests of a company in Finland are not the same as those of one in Argentina. As García Rey observes, "there are always general questions (Leo Messi, Macri, David Cameron...) that are of interest to everyone, and in those cases it is the hard core of the ICIJ that establishes the calendar and the embargo."

Nicolas Kayser-Bril, coordinator at The Migrant Files, draws attention to an interesting factor when it comes to agreeing on publication strategies, namely the opinion and interests of those who are funding the project: "It is a balance between the audience of the brand, its prestige –to please the funder– and the contacts available there."

4.3. *Elements involved in the collaboration*

4.3.1. Sources and tools

As noted above, Panama Papers and Football Leaks worked entirely from leaked information, although both projects verified this using other sources. The same thing occurred during the process of collaboration when information was checked by having recourse to other databases, banking and mercantile records, etc.

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The Migrant Files started its research working with three sources: a) the database of United for Intercultural Action, an umbrella organization that brings together 550 NGOs from all over Europe; b) information collected by Fortress Europe, an observatory created by the Italian journalist Gabriele Del Grande to monitor the deaths of migrants who try to reach Europe; and c) the data from PLUS, a project run by the University of Helsinki to register information from throughout the world in real time, separating out and publishing information related to immigration and people trafficking.

The NarcoData project started with a public petition that was sent to the government of Mexico requesting information on the drug cartels: "We realized that the information was incomplete, and we started to look for data from previous years in all the states," explains Yosune Chamizo, coordinator of the project at Animal Político, who adds that the project also made use of bibliographical sources and press archives.

The sources employed in the case of Investiga Lava Jato were highly diverse, ranging from public requests for information to the testimonies of those involved. As Milagros Salazar explains, records of companies involved, information revealed by the authorities, judicial documents and other data were cross-checked. This generated several methodological problems: it involved a lot of data relating to several countries, not only in Latin America but also in Africa, which made it necessary to standardize the information to be able to work with it using a large database.

Medicamentalia was also made possible on the basis of managing many different sources, both public and private, and at the national and international levels. For example, to be able to check the prices of medicines in Spain, data from the Secretary of State for Budgets and Expenditure was used, together with the records of the World Health Organization.

With respect to the packages of tools employed, the professionals interviewed underscored data usability and having secure communication tools available. For example, Stefan Candea, coordinator of Football Leaks, stressed that one of the main tools of the project was the creation of a safe search engine so that journalists in the network could access and search through large collections of documents. This search engine is currently available for anyone who wants to use it under a free software license (Stefan Candea, Football Leaks).

> For the project we also had a separate platform for secure communication and information exchange executed on Sandstorm.io, where several open code applications were housed that are proving useful for our collaboration, including storage services, chat and wikis.

The answers obtained in the questionnaires and the conversations confirmed the technical complexity involved in working with massive quantities of data proceeding from diverse sources and in different formats. As a result, there are several projects that, as well as using tools that were already available –generally free software–, created their own software according to their needs. The project that developed the greatest number of tools was Panama Papers, as Marcos García Rey explains:

> In the first place, we designed IHub: a platform that enabled all the participating media to work in a collaborative way. Secondly, we designed a repository for consulting the documents from different investigations (Lista Falciani, Paradise Papers, etc.) that functioned with two search engines: Blacklight and Knowledge Center. In the third place, we developed Linkurious, a search engine for creating visualizations of databases of relationships that was developed with NEO4J.

In the case of Investiga Lava Jato, several databases were created for compiling all the data and files. They used Overview for sharing the content on these databases and also used specific applications for secure communications –to encrypt internal mail and messages, for example.

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4.3.2. Professional teams

One distinguishing feature of all the projects is that they were run by interdisciplinary teams made up of journalists, developers, data analysts, visualizers, designers and editors –to name the most significant professional functions involved. On many occasions external personnel were hired and even freelance journalists took part, as in the case of The Migrant Files. The teams involving the greatest number of professionals were those responsible for Panama Papers, Investiga Lava Jato, Football Leaks and Medicamentalia. At the EIC, for Football Leaks, the organization was divided into several teams: News and Reportages, News Design, and Technology. It emerged from the professionals' answers that the team working on the Panama Papers had the most complex internal organization (Marcos García Rey):

> The investigation was coordinated by the ICIJ with a hard core of twenty-three professionals, which included reporters, data analysts and developers. The project head, Marina Walker, coordinated that hard core and then we coordinated, trained and collaborated with some three hundred and fifty professionals from sixty-five countries. The data journalism part was directed by Mar Cabra with her team of five professionals at the ICIJ.

4.3.3. Funding

Funding is another of the facets of the collaborations studied for this article. Several means of funding were found, all of which had previously been foreign to traditional journalism (Table 3):

Table 3: Funding the projects.

PROJECT	FUNDING
NarcoData	HacksLabs, Hivos, Avina, International Center for Journalism
Medicamentalia	Journalism grant from the European Journalism Centre
Panama Papers	Private sponsorship, resources provided to the ICIJ from international foundations. The participating media organizations processed their pieces with their own resources.
The Migrant Files	Journalism.fund (NGO)
Investiga Lava Jato	Crowdfunding, some pieces were supported by the Open Society Foundations
Football Leaks	No reply

Source: Own elaboration.

With respect to their work as watchdogs, Yosune Chamizo explains that these projects have helped to "unmask those in power who do not play cleanly." In fact, in the wake of the information made public by Panama Papers and Investiga Lava Jato, political officeholders in different countries were forced to provide explanations about their activities and some resigned, as in the case of the Prime Minister of Iceland and some senior officeholders in Brazil. As Marcos García Rey (Panama Papers) explains, "without investigative/data journalism the public and private powers would be more relaxed […] networks of collaboration are one of the few mechanisms capable of keeping up to speed with the globalized power structures, and are thus the only path to follow for investigative/data journalism." In this regard, Milagros Salazar (Investiga Lava Jato) considers that "the simultaneous publication of the stories in a project of this scale protects the findings of reporters in the face of the pressures."

5. Conclusions and discussion

The results offered are highly specific and although they share the usual limitations of case studies when it comes to extrapolating results to other, different cases (Yin, 2003), it is also true that they make it possible to base the analysis of data journalism on real examples of

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professional practice that have hardly been looked at until now in the field of Journalism Studies, where there is a predominance of studies focussing on the newsrooms of specific media organizations and of specific countries (Ausserhofer *et al.* 2020; Appelgren, Lindén & van Dalen, 2019).

This study not only focuses on journalistic practices that require international cooperation, but it also emphasizes the usefulness of these practices when it comes to reconfiguring the logic of contemporary journalism towards parameters based on greater accountability, thanks to investigative journalism.

The results compile the main characteristics of data journalism projects when these are coordinated by different types of journalistic organization. In this regard, they are useful for obtaining a practical understanding of the collaborative results described to date (Center for Cooperative Media, 2017; Sambrook, 2018), as well as for proposing new possibilities to be taken into account in future categorizations (Medicamentalia, Civio). They also enable an understanding of decisive aspects in the definition of this type of journalistic practices and products: the sources, tools, funding and internal organizations involved in working on the design of certain journalistic strategies (Q1). However, beyond the models, tools and funding involved, this study makes clear the complexity of cross-border collaborations in investigative journalism and, more specifically, in cross-border investigative data journalism, following on from earlier contributions that noted this circumstance (Fink & Anderson, 2015, pp. 475-476).

Our findings suggest that projects across borders like those examined in this study are currently one of the key bellwethers of the potentials of data journalism as an emergent phenomenon capable of changing journalism's intra and inter-organizational logics and practices. In contrast with earlier studies that found a lack of accepted standards concerning what should be considered excellence and quality in data journalism, as well as limitations imposed by factors like the use of free tools (Lynn, Hermida & Fulda, 2018, p. 2), this study showcases some of the main criteria that determine quality in the form and content of this type of product (Q1). These criteria include the capacity to overcome difficulties and promote transnational collaboration amongst numerous journalistic agents, solve problems in terms of developing the appropriate tools (search engines, internal mail, etc.), obtain funding and, in general, carry out objective investigative journalism (Q2).

This complexity entails difficulties and sets these types of production apart due to their greater cost in terms of time, human resources and professional dedication (Q2). Specifically, this complexity results from three aspects: the management of enormous amounts of data, the coordination of large teams located in different places, and the type of editorial and methodological decisions needed to guarantee success. The culture of collaboration is a factor that must be increasingly taken into account in journalism, despite such a culture having a lack of roots in the profession. This has been noted previously in studies on newsroom convergence, in which teams made up of journalists from different media organizations in the same group or from different companies in multimedia conglomerates showed increasing collaboration in setting multiplatform and transmedia projects underway. This collaboration is now spreading further and is being taken up by journalistic organizations with different goals and mass media of different types with different editorial lines.

Sophisticated and powerful data analysis tools are used in these projects, and this also requires considerable specialization in the professional profiles involved. Similarly, communications and sharing data amongst the different media organizations or partners require special security measures that add additional complexity. At the same time, it makes it necessary for many consensuses to be reached amongst partners with different media, languages, audiences, etc. As well as a diversity in terms of the professional roles participating in this type of project, there is an added cultural and geographical diversity resulting from the fact that the professionals involved are located in different parts of the world. With respect to editorial decisions, the choice of the publication date can in itself constitute a complex

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process, especially when the associated mass media cover different time zones and have different periodicities (daily, weekly, etc.).

These initiatives stand out in the context of today's journalistic work, not only because of their intrinsic complexity but also because of features such as being funded from different sources (grants, foundations...) that are not commonly found in the traditional business and economic models of the media. Another distinctive feature is the special sensibility these products show when it comes to encouraging and offering an objective journalism that is carried out despite the total absence of support from public authorities. In addition to relying on confidential sources, they develop secure tools for internal communications that stop any type of external interference. All of this underscores the usefulness of this type of product for recovering the democratic value of journalism by means of investigative activities, supported in this case by the advances provided by technologies such as big data (Q3). These technologies are therefore proving useful in renewing journalistic forms such as watchdog and accountability journalism (Cohen *et al.*, 2011; Gray & Chambers, 2012; Parasie, 2015; Felle, 2016).

The contribution of investigative data journalism, then, is clear, although it is important to consider that this contribution makes some demands of its public. It is worth considering here everything related to the ethical question involved in data journalism (Dörr & Hollnbuchner, 2017). In this respect, the analysis carried out highlights the importance of making clear to the readership the decisions taken regarding the dataset. Often the audience receives a large amount of pre-selected data and variables, but without information regarding the full process, so essential to every data journalism product. This can contribute to the audience doubting the reliability of the conclusions, as well as to a feeling that technology itself, by way of a kind of "technological paternalism," can make decisions (Appelgren, 2017).

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