

Alfonso Ollero Gavín

‘Do I really need to click on this
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an analysis of genre
transmediation, interactivity, and
new documentary practices in the
making of the Interactive Science
Documentary

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OF GENRE TRANSMEDIATION, INTERACTIVITY,
AND NEW DOCUMENTARY PRACTICES IN THE
MAKING OF THE INTERACTIVE SCIENCE
DOCUMENTARY**

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ABSTRACT

The technical affordances provided by the digital environment have brought about significant changes in human communication. Accordingly, genre theory pays close attention to how the demands of human communication are mediated in the web (Bazerman, 2002; Caballero, 2008). In a context of ‘participatory culture’ (Jenkins, 2006) and user-centred communication, genre theory focuses on how traditional genres have readapted to the new paradigm, and how these genres have been affected not only in a technical level and in the new digital meaning-making cues, but also in the social goals they pursue (Askehave & Nielsen, 2005). These social goals are influenced by the digital *kairos*, or opportunity for action – that is, the sense in which discourse can seize on the unique opportunity of a ‘fleeting moment to create new rhetorical possibility’ (Miller, 1984).

This study focuses on one of the genres that have undergone changes within this digital *kairos*: the Interactive Science Documentary (ISDoc). The ISDoc is an emerging genre, stemming from the matrix documentary genre, that involves forms of narration that make use of Web 2.0 affordances to allow for users’ interaction with the digital database (Gaudenzi, 2013). In the context of science communication online, interactive documentaries play a key role in disseminating science to diversified audiences and can be considered ‘parascientific genres’ (Kelly & Miller, 2016), or ‘genres, or protogenres, of science communication emerging online that do seem to blur the boundaries between expert and non-expert spheres of discourse’. Notwithstanding, the turn towards digital implies new challenges to genre analysts as regards the use of traditional analytical methodologies to determine the ‘centrifugal and centripetal forces’ (Miller, 2016) that configure these genres.

In this study, I adopt a varied methodological approach to the study of the target genre. Firstly, I trace the development of the matrix documentary genre and its social action, the Documentary Contract (Skartveit, 2007). From here, I determine how this social action evolves into the digital *kairos* and configures emerging genres such as the Interactive Documentary. Secondly, I examine the ways in

which science is communicated online, and how the digital arena evidences processes of ‘boundary erosion’ (Trench, 2008) between spheres of expert and non-expert discourses and audiences. I also examine how genre theory undertakes the analysis of the technical features of the medium and their influence in discourse. Stemming from this, I propose the concept of *hypersemiosis* to explain the genre uptake, textual practices and schema (Freadman, 2002) that users have to draw on to navigate hypermodal and interactive structures online. The hypersemiotic framework provides the analytical basis for the study of the ISDoc, thus providing insights into how the genre makes use of available digital materialities, semiotic modes (Bateman, 2017), interactive features, patterns for narrative structuration, and documentary narrative modes; all geared towards the study of the enactment of the ISDoc’s Documentary Contract and its positioning among similar genres for science communication.

RESUMEN

Las posibilidades técnicas proporcionadas por el entorno digital han provocado cambios significativos en la comunicación humana. En consecuencia, la teoría de géneros presta especial atención a cómo se mediatizan las demandas de la comunicación humana en la web (Bazerman, 2002; Caballero, 2008). En un contexto de 'cultura participativa' (Jenkins, 2006) y comunicación centrada en el usuario, los estudios de género (Genre theory/studies) se centran en cómo los géneros tradicionales se han readaptado al nuevo paradigma y cómo estos géneros se han visto afectados no sólo a nivel técnico y en las nuevas formas digitales de creación de significado, sino también en los objetivos sociales que persiguen (Askehave y Nielsen, 2005). Estos objetivos sociales están influenciados por el kairos digital, o la oportunidad para la acción, es decir, el sentido en el cual el discurso puede aprovechar la oportunidad única de un 'momento fugaz para crear nuevas posibilidades retóricas' (Miller, 1984).

Esta tesis se centra en uno de los géneros que han experimentado cambios dentro de este kairos digital: el Documental Científico Interactivo (ISDoc). El ISDoc es un género emergente, derivado del género matriz del Documental, y que implica formas de narración que utilizan las posibilidades de la Web 2.0 para permitir la interacción de los usuarios con la base de datos digital (Gaudenzi, 2013). En el contexto de la comunicación científica en línea, los documentales interactivos juegan un papel clave en la difusión de la ciencia a audiencias diversificadas y pueden considerarse 'géneros paracientíficos' (Kelly y Miller, 2016), o 'géneros, o protogéneros, de comunicación científica emergentes en línea que parecen difuminar las fronteras entre las esferas de discurso experto y no experto'. No obstante, el giro hacia lo digital implica nuevos desafíos para los investigadores en cuanto al uso de metodologías analíticas tradicionales para determinar las 'fuerzas centrífugas y centrípetas' (Miller, 2016) que configuran estos géneros.

En esta tesis, adopto un enfoque metodológico variado para el estudio del género objetivo. En primer lugar, trazo el desarrollo del género matriz del Documental y su acción social, el Contrato Documental ('Documentary Contract', Skartveit,

2007). A partir de aquí, determino cómo esta acción social evoluciona en el kairós digital y configura géneros emergentes como el Documental Interactivo. En segundo lugar, examino las formas en que la se comunica ciencia online y cómo el ámbito digital evidencia procesos de 'erosión de fronteras' (Trench, 2008) entre las esferas de discursos y audiencias expertas y no expertas. También examino cómo los estudios de género abordan el análisis de las características técnicas del medio y su influencia en el discurso. A partir de esto, propongo el concepto de hipersemiosis (hypersemiosis) para explicar el conocimiento de géneros ('genre uptake'), las prácticas textuales y 'schema' (Freadman, 2002) que los usuarios deben emplear para navegar por estructuras hipermodales e interactivas en línea. El marco hipersemiótico proporciona la base analítica para el estudio del ISDoc, proporcionando así una visión de cómo el género utiliza las materialidades digitales disponibles, los modos semióticos (Bateman, 2017), las características interactivas, los patrones para la estructuración narrativa y los modos narrativos documentales; todo orientado al estudio del cumplimiento del Contrato Documental del ISDoc y su posicionamiento entre géneros similares para la comunicación científica.

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LIST OF ACRONYMS

1. **CGI**: Computer Generated Images
2. **CMCMD**: Convergent media computer-mediated discourse
3. **CMDA**: Computer-mediated discourse analysis
4. **CFT**: Cognitive Film Theory
5. **EAP**: English for Academic Purposes
6. **ESP**: English for Specific Purposes
7. **HCI**: Human-Computer Interaction
8. **IDN**: Interactive Digital Narrative
9. **IDoc**: Interactive Documentary
10. **ISDoc**: Interactive Science Documentary
11. **ISS**: Interactive Sites/Signs
12. **OS**: Open Science
13. **PES**: Public Engagement with Science
14. **PEST**: Public Engagement with Science and Technology
15. **PUS**: Public Understanding of Science
16. **RGS**: Rhetorical Genre Studies
17. **SD**: Science Documentary
18. **SFL**: Systemic Functional Linguistics
19. **SNS**: Social Networking Sites
20. **SPP**: The model of System – Process – Product
21. **UI**: User Interface
22. **VURP**: Viewer-User-Reader-Player

Specific to Elleström (2014, 2017) approach to transmediation

- Compound Media Characteristics (C)
- Media Product (MP)
- Technical Media (TM)

INTRODUCTION

1. SETTING THE SCENE

1.1 Initial considerations

Since its early beginnings in the 1990s, the advent of the World Wide Web altered the nature of human communication, coming to adapt traditional forms of delivery of information in varied ways (Hafner & Lyon, 1998; Hauben & Hauben, 1998). What followed this appearance was a Darwinian-like series of transformations in the ecology of genres, which could be observed as a ‘survival of the fittest’ demand for the adaptation of genres from the old formats to the new media requirements. The form of these traditional genres mutated with the shift from more author-centred forms of text decoding towards more user(reader)-centred and hypertextual patterns. Genre theory has come to observe how these patterns seem to be ever-changing and dynamically readapting to how the demands of human communication are mediated in the web (Bazerman, 2002; Caballero, 2008). genre theory nowadays addresses the study of a paradigm in constant flux, which adopts a double stance. On the one hand, the analeptic analysis of the causes that, in a more or less stable manner, serve to explain how human communication has evolved through time; on the other, the proleptic study of how individual, user-centred and individual communicative behaviour has come to create the illusion of recurrence in the emergence of genres in the web (Miller, 2016). Among this technological turmoil, and the implications of a user-centred paradigm of web-mediated communication, it is important to understand how traditional genres have readapted to the new paradigm, and how these genres have been affected not only at a technical level and in the new digital meaning-making cues, but also in the social goals they pursue (Askehave & Nielsen, 2005). This investigation analyses one of the genres that was subject to the aforementioned processes: the documentary.

Analysing the documentary genre and how it has evolved to make use of the available technical affordances of the web initially sets the point of departure of this PhD investigation. The documentary, in its earlier forms, is susceptible of

being studied as a typified form of human interaction which mediates the author's intentions (his/her pursuit of certain objectives) and how they are transmitted to the audience. In other words, how the communication of 'facts' is presented to the viewers, and how the documentary uses them to raise awareness on the part of the audience (Renov, 1993; Skartveit, 2007). Nonetheless, this more or less stable pattern of communication has changed with the adaptation of the documentary to Web 2.0, raising different implications such as the following. Firstly, considering the documentary as a 'communicative product' with a relative informational value makes the genre susceptible of being analysed under the optic of new modes of audio-visual production, among others. This can explain the recent effort of the journalistic sector in understanding the documentary form and content and readapting it to its purposes (Bogost, Ferrari, & Schweizer, 2010; Vázquez-Herrero & Lopez-García, 2019). Secondly, and in line with this journalistic intent, the aforementioned communication of facts is now aligned with the user-centred paradigm of the web, which currently demands increasing control of the flux of information. Accordingly, audio-visual platforms are offering products that place the user in control of the digital interface and, thus, in the choice of contents he/she is exposed to: this process is key to understanding the transformation of new digital genres and the technical affordances of interactivity, which gave birth to the Interactive Documentary (IDoc). Consequently, the change of traditional forms of discourse (due to the increasing and varied ways in which the user is put in control of the interface) drives forward the fragmentation of audiences and the potential reach of the traditional genres in the new web, further diversifying the targets that should be analysed in order to comprehend the documentary genre. All in all, comprehending these implications is not a matter of linearity or direct sequentiality. Rather, it is a matter of understanding the interplay between them, an occurrence that replicates the evolution of the documentary from the point of view of genre theory.

The documentary can also be understood from the point of view of the different contents it explores. Of course, the social intent of this genre gives rise to documentaries that examine the humanistic and existential side of society, which

have marked the trend for a remarkable portion of documentaries to follow. But the present PhD investigation focuses on the alignment of the social motivation of the documentary and that of science. Obviously, the equation of science and documentary form has been noticeably productive, with the consideration of certain Science Documentaries (SDocs) as landmarks in the history of audio-visual production (Davis & León, 2018; Van Dijck, 2006). However, it is worth examining the way in which communication of science is also changing as a result of new social exigences. The stream that drives the process of making knowledge accessible and visible is known as Open Science (OS) (Vicente-Sáez & Martínez-Fuentes, 2018). The OS movement has permeated through different layers of what 'accessible knowledge' means, from more tangible materials such as the publication of raw data, to the more meta-technological discussion of what privacy and authorship means in a digital context which fosters users' increased participation (Maciel, Abdo, Albagli, 2015). Accordingly, scientific dissemination in the light of OS offers citizenship different forms for accessing scientific knowledge in the Web 2.0, a happening that can be tested by navigating the web's most common video platforms and analysing these online science videos. In relation to this, the science documentary can be said to not only feature the strict communication of scientific contents, but also the social motif, shared with the OS movement, of including citizenship in this process.

The crucible between the social side of both user-centred communication in Web 2.0 and the dissemination of scientific contents (that is, between Interactivity and Science) is, as the present investigation examines, the documentary form. More concretely, this thesis analyses the 'ISDoc' (Interactive Science Documentary) as that form that represents the crucible of social interactions that take place in this genre in all its dimensions: the artistic, humanistic, and, within the scope of this work, the scientific. Furthermore, it being a relatively under-theorised form as a conjoint, the possibilities for the present investigation on this field seem open enough to explore the more technical side of the evolution of documentaries, the multiplicity of forms which scientific communication can adopt within the target genre, and also the challenges that the ISDoc as a genre faces in direct contact with

society in the fulfilment of its social objective. The present investigation aims to understand these and other related issues, such as audiences and creators in Web 2.0, or ethical challenges for scientific dissemination. To this aim, it draws on using rhetorical approaches to genre theory, documentary audiovisual theories, and scientific communication theories. This PhD investigation will ultimately try to support the genre in its efforts of democratising science and enhancing scientific literacy in the making of a new, digital society.

1.2 Aim of the investigation and rationale

Following the discussion presented in section 1.1, this PhD thesis aims to discuss the following issues. The rationale and aims that guided the exploration of the different concerns that this thesis examines are also given below.

Firstly, and drawing on Rhetorical Genre Studies and genre theory, we could assume that the documentary can be characterised as a cultural object which is historically mediated and has a social motif / objective, that of raising social awareness among the members of the audience.

- Issue 1: How can the documentary be characterised historically from the point of view of genre theory?

In the light of the reviewed literature, it could be hypothesised that the documentary as a mediated form must follow an agreement between the creators and audiences, something that explains its functioning and continuity since its earlier forms.

- Issue 2: What are the main social goals of the documentary genre, and which are the social conditions that enable its functioning?

Moreover, it might be assumed that the technological implications of Web 2.0 as a medium for communication have reached and altered not only the form and contents of the documentary, but also the way in which its audiences and creators are related.

- Issue 3: How has the documentary genre evolved as a result of the technological affordances offered by the Web 2.0?

The Open Science movement, in its efforts of making knowledge shared and accessible, has made software applications and technology available for creators to widen the range of actions engaged in a documentary. Therefore, it can be hypothesised that these technological developments may account for generic change and evolution.

- Issue 4: Which further implications does the Open Science movement have in relation to the material conditions available for the creation of documentaries?

Furthermore, it could be hypothesised that the connection between science and documentary lies in the humanistic effort of both in trying to raise awareness among audiences through the presentation of objective facts.

- Issue 5: What is the seemingly intrinsic relation between science and the documentary genre, and where does this relation find its foundations?

The Open Science movement may exploit the intrinsic relation between science and documentary and provide audiences and creators with further tools to access and publish scientific data.

- Issue 6: Which implications does the Open Science movement have in relation to scientific communication and the documentary genre?

It could initially be assumed that the way in which science documentaries and other online science genres behave may differ due to the constraints and nature of the streaming platforms on the one hand and the demands of the audiences on the other hand.

- Issue 7: How does the documentary genre differ from other forms of science dissemination in the Web 2.0?

Hypothetically, the Web 2.0 has not only led to a fragmentation of the audiences based on the availability of contents, but has also provided tools, such as social media, that enhance connection between diversified audiences

- Issue 8: How is the role of audiences changing in the context of digital genres, and how different is its relation with them from a technical point of view?

Furthermore, the increasing participation of audiences in the new digital paradigm has provoked a change in the consideration of authorship as an indisputable entity in charge of creation and evolution of the genres.

- Issue 9: How is the role of creators, authors, and producers changing in the context of digital genres?

1.3 Main research questions

Taking into account the above issues and initial considerations, the following can be considered as the broad research questions (RQs) that guided the present investigation

1. How are the social objectives of the documentary genre aligned with the interests of scientific communication?
2. Which technical affordances in the context of Web 2.0. have supported the transmediation of the documentary genre?
3. How is scientific knowledge in ISDocs constructed through the narrative relation established by its creators and audiences within the digital interface?

2. THE INTERACTIVE SCIENCE DOCUMENTARY (ISDOC) AS OBJECT OF STUDY

2.1 The place of the ISDoc within audiovisual genres, Web 2.0, and science

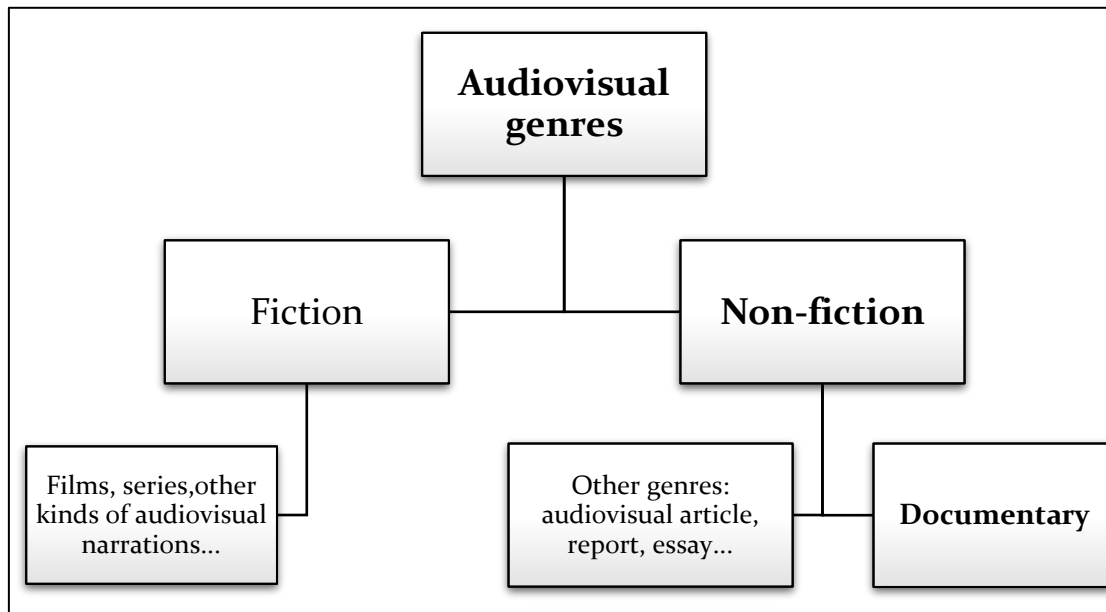
As proposed in the previous section, this study seeks to analyse the evolution of the documentary genre and its adaptation to the affordances provided by the Web 2.0 in order to communicate science to non-expert, diversified audiences. Nonetheless, the merging of these variables (documentary, science, and digital interactivity) should not be understood as a monolithic and invariable entity, but rather as the result of a process of convergence that has crystallised in the appearance of the ISDoc as the genre that can better fulfil the functions of each of

the variables together. Quite obviously, some variables could not have occurred and evolved in a synchronic manner: the documentary genre, for instance, had already been functioning prior to the introduction of the first Internet devices for half a century (Gifreu Castells, 2013, p.10). Nonetheless, and as explained in section 1.1 in this chapter, Web 2.0 provided the documentary genre with possibilities that aligned with its social goals and expanded the range of topics and communicative possibilities that could be exploited by an increasing number of audiences (Dovey, 2014, p.12). In that way, the convergence between ‘documentary’ and ‘web’ proved a fruitful one. Generally, the topics that the documentary engages with are also those which follow a social goal, the necessity of creating a better society with committed citizenship now in the form of audiences: once again, the interests of science and documentary proved to be very similar from the early beginnings of the genre, exploiting the possibilities of the technological advances in film and a growing interest on the part of the scientific community of communicating their findings especially among other scientists; that is, as a formative tool for those researchers in similar areas. All in all, the ISDoc has come to occupy a recognisable place within the ecology of audiovisual genres of science in the web, but it is necessary to understand parallel genres (both fiction and non-fiction) that have resulted from different evolutions of the social goals of either variable (see Figure 1). This positioning of the target genre can be better understood by separating some of its core components, as the following subsections explain.

The place of the documentary as an audiovisual genre

Figure 1

Documentary and other audiovisual genres



Note. Adapted from *El documental interactivo como nuevo género audiovisual*, by A. Gifreu Castells, 2013.

Figure 1 specifies the place of the documentary in comparison to other audiovisual genres such as films, audiovisual articles and reports, etc. Within the figure, the category ‘audiovisual’ refers to all of those genres that make use of image and sound (i.e. the visual and aural modes) in order to create meaning and achieve its goals, thus conforming to a wide category. In any case, this distinction is used to separate the posterior classification of the documentary from other written or oral genres that could potentially pursue similar social aims. The middle level establishes the distinction between those audiovisual genres that serve to disseminate factual information, where the documentary is located (‘Non-fiction’), and other genres in which the reality portrayed exclusively corresponds to that of the diegesis, not to ‘real-life’ events as they are outside that narrative (‘Fiction’). Finally, in the lower level of the figure above, the documentary appears separated from other audiovisual non-fiction genres because of the choice of topics, narrative devices, and social motives, something that will be explained in chapters 1 and 2 in this thesis.

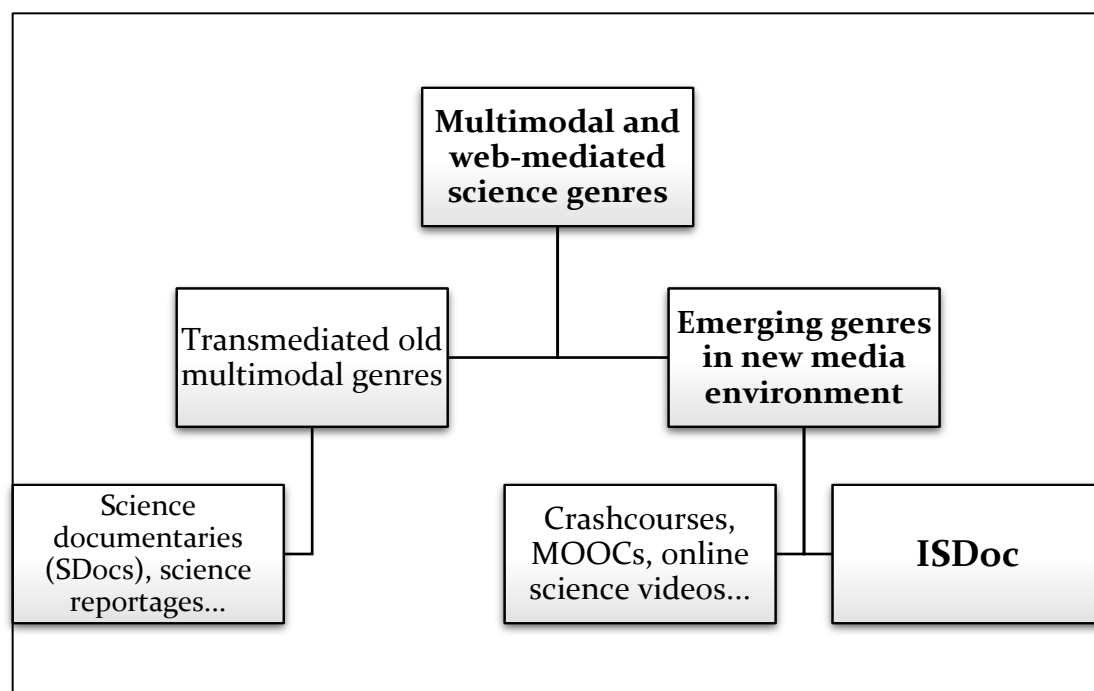
The place of science in the documentary genre

From the range of topics that the documentary genre covers, this study focuses on those that are related to communication of issues related to health and wellness, ecology, conservation, digital technology, and engineering. In other words, they correspond to the wider label of 'science'. The documentary genre is not restricted exclusively to the dissemination of science knowledge, since the narrative devices and social goals of the genre allow for more topics to be explored. In the light of the documentary's intention of raising awareness among audiences and enhancing citizen participation, the genre can also cover other topics related to arts and cultures, war and conflict, personal growth and experience or history, to name a few. Further sections in this thesis will explore the range of topics that the documentary has traditionally covered. Nonetheless, it is worth mentioning that a clear-cut classification of documentary topics is difficult to carry out, since some of these topics can coexist within a documentary project either as an individual choice of that project or as part of a continuous or well-founded relation between science and other issues.

The place of the ISDoc as a multimodal and emerging web-mediated science genre

Figure 2

ISDoc and other audiovisual web-mediated science genres



The emerging ISDoc genre falls within the category of multimodal, web-mediated, science genres. By considering the ISDoc as ‘emerging’ this study defines emerging genres as those that did not exist prior to the formation and exploitation of the Internet as a platform for the creation, diffusion, and storage of content (Miller, 2016). Nonetheless, and moreover, emerging web-mediated genres should not only take account of the aforementioned affordances, but also include the constraints that are tacitly agreed on by audiences regarding those genres and the expectations that these audiences have when facing one of these genres. In other words, when audiences encounter (native) emerging web-mediated science genres, they may expect them to be adapted to the demands of the possibility of communication between audiences and creators, length in time of the material, use of digital technologies and so on, which follow a similar pattern to other emergent web-mediated genres.

I should emphasise this in order to clarify questions about the nature of ‘online science videos’ (for instance) as an emergent web-mediated science genre. Although the overall layout of the presentation of scientific content may be very similar to old-media science genres, genres such as the online science video inherently exploit the communicative affordances of the Web 2.0 in terms of the demands mentioned above: new necessities of production and dissemination of scientific content may adapt to shorter formats which enhance audiences’ participation and questioning through broadcasting social platforms (such as YouTube or Vimeo), which is something that lies at the core of these entities as genres. By transmediated old multimodal genres, this study refers to those genres that were not originally created taking account of the affordances of the Web 2.0 (Kwasnik & Crowston, 2005). This may be largely due to the historical trajectory that these genres may have followed as a result of their original conception as entities that would only be broadcast on television, for instance.

Nonetheless, these genres could feature in a Web 2.0 broadcasting platform due to the technical similarities that the digital space can find with the original visualisation method intended for them (the phenomenon of transmediation, as proposed by Bateman and Elleström, is based on these premises). In this way, the

difference that this study finds between ISDocs and SDocs is based on the former being an emerging genre in Web 2.0 which profits from and is based on the possibilities of web interaction and communication. These digital affordances make the ISDoc different from the SDoc. The SDoc is not an emerging genre in Web 2.0, although it can be accessed through broadcasting platforms in the web and transmediated into the possibilities of the Internet. Part 2 in this study will deal with this issue in more depth. Among emerging web genres, ISDocs is catalogued differently from others such as those exemplified in Figure 2. These differences, once again, are based on the nuances in the consideration of the social goals and narrative features of each genre, together with its adaptation to the Internet medium.

3. INTERPRETIVE FRAMEWORKS

This chapter undertakes a review of theoretical a review of theoretical works that have previously addressed these variables and that will be used as the theoretical foundations for the study

3.1. Theory of genre

To answer the main research questions, this study took account of the three Rhetorical Genre Studies (RGS) tradition for genre studies and applied linguistics. From this tradition, the author who was mainly employed in this thesis was Carolyn R. Miller (Miller et al.; 1984, 1994, 2004, 2014, 2016) with a major focus on her contributions on rhetorical approaches to genre. Within RGS, other authors such as Bazerman (1994, 2002, 2004), Freedman (2002), or Kelly (2016, 2017) were examined. Other sources were critically reviewed in order to contextualise the ISDoc for more specific goals. For the exploration of digital genres, for instance, Askehave and Nielsen's work (2005) was used in order to provide a general overview, which was further complemented with Finneman (1999) and the possibilities of hypertext (and how this affected the creation of new documentaries). Additionally, Bateman's (2008, 2011, 2013, 2016, 2017) methodology for triangulating multimodality, mediality, and genre was favoured primed for the

analysis of the object of study. Lastly, Elleström's views on media analysis and media transformation (2010, 2014, 2017, 2019a, 2019b) were considered to understand the evolution of the ISDocs from the matrix genre of Science Documentaries.

3.2. Theories on documentary genre

The perspectives of journalism and documentary theories are particularly important for this study. The thesis aligns with the aforementioned objective of characterising the ISDoc diachronically in order to understand the social forces driving its evolution. Moreover, considering the documentary as a 'communicative product' with a relative informational value makes the genre susceptible of being analysed under the optic of new modes of audio-visual production. For that purpose, authors such as McLane (2012), Nichols (1991, 2001), Renov (1993), or Skartveit (2007) were reviewed.

One key word in the analysis of the documentary genre is 'interactivity'. Gaudenzi (2013) defines interactivity as "the ensemble of transformations that occur to the artefact's components as a result of the human-machine inter-action", understanding these components as the database, the interface, or perception of space (p. 14). This thesis also sides with authors such as Gaudenzi (2013), Gifreu-Castells (2013), and Nash, Hight, and Summerhayes (2014) and will seek to demonstrate that interactivity is the main technical affordance provided by Web 2.0 to the documentary genre and the core element of the evolution of the documentary genre into Interactive Documentary. To understand the operational processes of digital storytelling, Koenitz's works on Interactive Digital Narratives (2010, 2014, 2018, 2023) were reviewed. Finally, Adami (2013) and her study on Interactive Sites/Signs helped to conceptualise the pragmatic / linguistic aspect of interactivity.

3.3. Theories of scientific communication

The present study is also reflective of the role of scientific communication in society, especially in the light of the Open Science Movement (Maciel, Abdo, Albagli, 2015; Vicente-Sáez & Martínez-Fuentes, 2018). The equation of science and

documentary form has been noticeably productive, with the consideration of certain Science Documentaries (SDocs) as landmarks in the history of audio-visual production. In this sense, this thesis analyses the Science Documentary genre as a form of scientific knowledge dissemination, thus expanding the work of authors such as Dahlstrom (2013), Davis and León (2018), Davies and Horst (2016) or Van Dijck (2006). Finally, and in describing the rhetorical nature of this genre, the thesis also seeks to assess the implications of the Open Science movement in relation to the material conditions available for the creation of documentaries.

4. OVERVIEW OF THE PARTS AND CHAPTERS

The present study has been organised in accordance with the different issues that arise from the characterisation of the ISDoc, ranging from the theoretical to the experimental. Accordingly, Parts 1 and 2 are further subdivided into chapters that illustrate the variety of issues in the description of the target genre.

Part 1 covers issues of characterisation of the documentary within the scope of genre theory and science communication. Chapter 1 lays the foundations for the discussion of the documentary as a historically mediated artefact susceptible of being analysed as a genre. Through the exploration of both the documentary's point of departure and parallel changes in society and technology, this chapter also analyses the 'Documentary Contract' (Skartveit, 2007) as the definition for the genre's goals and objectives of enhancing the audience's implication in the 'real world'. The consideration of the place of the genre in the digital era, as well as reflection on the effect it may have in the 'Documentary Contract', sets the ground for the investigation on the dynamic relation that documentary and journalistic stances in the delivery of information have come to develop with the advent of Web 2.0. This chapter finally provides the foundations for understanding documentaries in the context of society's new demands, and how these demands, parallel with the technical possibilities, have resulted in the consideration of new forms of documentary as 'interactive', thus giving rise to the label Interactive Documentary (IDoc).

Chapter 2 undertakes the reflection on the ‘Documentary Contract’ in relation to scientific communication by providing an account of early forms of the science documentary (SD) and the evolution of the genre. This study is further complemented by the examination of scientific communication in the light of the Open Science paradigm, aiming at understanding the implications that increasing forms of audience (and citizen) participation may have in the consideration of SD. The chapter also offers a study of how science is currently being communicated in Web 2.0, drawing parallels between the documentary genre and how the digital medium may be mediating the dissemination of scientific knowledge through akin digital genres. The chapter finally comes to reflect on different stances within scientific communication, and how cognitive and ethical issues may affect the creation of SDs.

The discussion for the material and technical conditions that hold the creation of Interactive Science Documentaries (ISDocs) will be the main focus of chapter 3. This chapter further deals with the inherent multimodal nature of communication through the digital medium, different reader stances in web exploration, and the adaptation of the documentary technical and visual styles to the affordances of digital interfaces. The analysis is complemented by the definition of interactivity in relation to multimodality, bringing to the fore different modes of relation between human and machine actants before ultimately considering its effects on ISDocs production. As a result of this exploration, the concept of ‘hypersemiosis’ arises to explain the operations of meaning-making involved in the exploration of digital genres.

Part 2 in this thesis provides the analysis of the different elements that configure the ISDoc genre. Chapter 4 provides the framework for the analysis of the target genre, and is also subdivided into two main sections. In the first part, the Massachusetts Institute of Technology Open Documentary Lab (MITODL) is studied as a case of a rhetorical community responsible for the creation and storage of ISDocs and further characterised by their intent in fostering creativity on the part of creators and maximising their relation with audiences. In the second section, the main methodologies analysed in Chapter 3 are integrated into the

hypersemiotic framework. The framework scales from the analysis of the materialities and semiotic modes that conform the genre, the processes of media transformation that affect them, the role of interactivity on the ensemble, the structuration of lexias and narrative vectors, and the accomplishment of the Documentary Contract and its clauses.

Chapter 5 integrates three case studies of paradigmatic samples of ISDoc texts. The chosen texts (*The Last Generation*, *InfoAmazonia*, and *Behind the Dirty Gold*) feature distinctive materialities, modes of interaction, and strategies for communication of scientific contents, and serve to illustrate the varied approaches to the enactment of the Documentary Contract in the kairos of Web 2.0 genres.

Lastly, Chapter 6 contains the interpretation of the previous analysis, in order to explore the relationship between the components of the ISDoc and assess the accomplishment of the genre's social exigence. As part of the analysis, a general characterisation of the genre is provided, containing an overview of the most common procedures that are exploited in ISDocs. The final section is devoted to the conclusions of the study, which contain the final reflections on how this study underpins research practices in documentary filmmaking, science communication, and analytical tools in Rhetorical Genre Studies.

PART 1: DOCUMENTARY, SCIENCE, AND DIGITAL GENRES

CHAPTER 1. DOCUMENTARY AND GENRE

This chapter aims to explore *the origins of the documentary genre and its evolution into the digital paradigm*. Different questions articulated this exploration:

1. Which are the early forms of documentary films?
2. How can the documentary form be defined as a genre?
3. How has the documentary form evolved in the Web 2.0?

For the first question, I review the first instances of documentary filmmaking and how they address the question of the ‘creative treatment of actuality’ (Winston 1995, p. 8). To that end, this section provides a revision of how early filmmakers approached reality in its practices, and how different ‘modes of representation’ of documentary (Nichols, 2001) open questions about what binds the documentary form together.

In that line, section 1.1.2 within this chapter explores Skartveit’s (2007) concept of ‘Documentary Contract’ to answer the aforementioned debate about the label ‘documentary’. Its two main clauses, ‘Truth and Reality’ and ‘Edifying Actively and Challenge’, are contested in the context of further practices in documentary filmmaking (such as mockumentaries) and in consideration of the role of audiences in the genre. From here, section 1.1.3 examines how the ‘Documentary Contract’ constitutes the genre’s social action (in Miller’s 1984 terms, and under the optic of Rhetorical Genre Studies). This section introduces further concepts such as ‘social exigence’, ‘rhetorical communities’, and ‘context collapse’ in order to understand the evolution of the documentary form.

The third question, related to the evolution of documentary in Web 2.0, is investigated in section 1.1.4. The result of this development coalesces in the IDoc (Interactive Documentary; Gifreu Castells, 2013), characterised by new forms of audience participation (Gaudenzi, 2012) and ‘modularity’ (Manovich, 2001). Finally, these new filmmaking practices are analysed in the context of the Open Source movement, setting the grounds for debate about how participation is established in the genre and by which actants.

1.1. DEFINING DOCUMENTARIES AND THEIR EVOLUTION: A LITERATURE REVIEW

1.1.1 What is a 'documentary'?

Although the target genre of this PhD investigation has existed for over a hundred years, as the discussion below purports to show, it remains disputed to reach a definition which accounts for the seemingly chameleon-like nature of the documentary (see Eitzen, 1995; Juel, 2006; Hernández-Corchete, 2004; Plantinga, 2005). Aufderheide (2007, p. 1) accounts for the problems of naming and defining the genre by contrasting it with what a documentary is not. Aufderheide admits that establishing wide classifications such as 'movie', 'serious', 'theatrical', 'entertaining', or trying to assign the function of 'representing reality without manipulating it', is erroneous, given that documentary (1) can adopt the aforementioned features and (2), in offering a view of facts based on the interests of the author, is intrinsically flawed in its depiction of reality.

In a similar fashion, Nichols (2001, p. 20) notes that a definition of the documentary is always 'relational or comparative', further arguing against the notion of 'documentary as a *reproduction* of reality', but rather as a '*representation*'. Representing reality to an audience involves more than providing a faithful portrait of reality, Nichols says; he claims that a representation is judged "by the nature of the pleasure it offers, the value of the insight or knowledge it provides, and the quality of the orientation or disposition, tone or perspective it instils" (p. 21). Nichols concludes that, even if a holistic definition of the genre's variable nature can be accounted for by approaching it from the points of view of 'institutions, practitioners, texts, and audience', it remains always 'prototypical', meaning that it will be restricted to the different cases in which the documentary genre 'operates and evolves'.

McLane (2013) also structures her task of defining documentary around different features. She includes 'subjects and ideologies', with a specific focus on the human condition as a whole; 'purposes, viewpoints or approaches', by recording actuality and informing and persuading about it; 'forms', and the rupture from traditional structures of plot or character development; 'production methods and techniques',

with the material conditions that are usually assumed for the recording of documentaries (an idea also found in Bordwell & Thompson, 1995); and 'experiences' and a twofold audience response based on the aesthetic and functional value of the genre.

From the discussion above, it could be deduced that documentaries are audiovisual works that (1) are a *representation* (rather than a reproduction) of reality, (2) should assume their intrinsically subjective vision of facts, and (3) vary in accordance with their subjects, purposes, form, production, and the type of audiovisual experience. As can be seen, reaching a unified definition of what documentary is may be a hard task, considering the multiplicity of different agents and interests that take part in the formation of the genre. Nonetheless, it might be helpful to examine the history of documentaries to understand how different coetaneous artistic and technical-scientific influences contributed to the range of functions achieved by this audiovisual genre in its early stages.

1.1.2 An evolution of the documentary form: around 'actuality' and 'creativity'

In the same way that scholars do not fully agree on a single definition of documentary, neither seemed the founders of the genre to share similar expectations about the functions it was supposed to fulfil. McLane (2013, p. 7) notes that the cultural changes at the end of the 19th century drove society's attention towards anthropology and an increased examination of the human condition, which is parallel to the appearance of masterpieces in other scientific, humanistic and artistic fields (e.g. Frazer's *The Golden Bough*). Nichols adds to this fact the early filmmakers' critical eye to capture the public's opinion and tastes in order to put forward their 'creations'. Nichols (2001, p. 83) explains that early cinematic forms greatly profited from the audiences' awe in contemplating pictures in motion which showed the most wondrous aspect of an 'unexplored part of the world', while indeed being in another part in that same world.

But the voice of the director, and how it could potentially serve to interpret reality, remained silent in the film, Nichols claims. The technical advances of the era had indeed contributed to a development of the range of functions that pre-existing

forms of communication had at the time. Nevertheless, and in the words of Grierson, one of the pioneers of the genre, the ‘creative treatment of actuality’ (Austin & De Jong, 2008; Kerrigan & McIntyre, 2010; Marcus, 2010; Winston, 1995) that later documentarians would come to profess was not of interest to the audience. The proto-documentary was a genre self-restrictive in itself, in that it limited its analysis of reality to the immediate present, and captivated the audiences’ attention more through the form than through its content. It took the effort of individual creators to expand the boundaries and possibilities of the genre, while still regarding the earlier successful conventions and the technical possibilities of the audiovisual medium at the time.

Aufderheide (2007, p. 25) signals Robert Flaherty, John Grierson, and Dziga Vertov as the early creators that, in their own way, made a ‘creative treatment of actuality’ through their works. Flaherty¹, with its masterpiece *Nanook of the North* (1922), would inaugurate the documentary genre through its original sequencing in time and space of ‘reality’ footage in order to create an emotional tale of the life in the Inuit community (Cock, 2009, p. 52); however, his understanding of the documentary as an aesthetic entertainment together with his Rousseauistic vision of the subjects (mostly peoples in communities with smaller economies) and the deliberate manipulation of their lifestyle arouse much criticism with the later growth of anticolonial consciousness (Aufderheide, 2007, p. 32). Grierson², for his part, conceived the documentary as ‘a new idea for public education’ (Grierson, 1971): abandoning Flaherty’s aesthetic drive, he concentrated on projecting a moralist view on the evolution of society which was in accordance with the British government and larger corporations’ interests (Smyth, 2013, p. 84). Finally, Vertov³ represented the most experimental branch of evolution of the pre-1930s documentary. His *Kino-pravda* (1925) and *Man with a movie camera* (1929) not only raised the standards in terms of audiovisual editing (introducing different techniques and types of shots), but more consciously reflected on the work of the

¹ For more bibliography on Flaherty, see Barsam (1988), Christopher (2005), Hainstock et al., (2014), Lampe (2005).

² On Grierson: Aitken (2013), Forsyth (1990), Swan & Paul (1989).

³ On Vertov: Delgado (2009), MacKay (2018), Zimmerman (1992).

director in the collection of 'reality' and the relation that was established within the 'act of perceiving' that involved the audience.

Paul Rotha, a later documentary scholar, would cast a critical eye in his reflection on what the documentary's functions were. In his *Documentary film* (1935), he notes the existence of different traditions: the naturalist (romantic), the realist, the newsreel, and the propagandist. With this classification, Rotha was establishing a range of possibilities for a newly born genre, setting its boundaries, but also connecting its evolution with the historical determinants and (what he considered) his coetaneous society's needs. Nichols, in a more contemporary approach, marked the joining of 'display and documentation' within the documentary genre through three 'legs': poetic experimentation, narrative storytelling, and rhetorical oratory (p. 88). Accordingly, he identified several modes of representation through which the documentary genre could be characterised throughout history and which mark the different approaches to what 'documenting reality' meant: poetic, expository, observational, participatory, reflexive, performative. This balance between 'display and documentation', as well as for the 'creative treatment of actuality' as a guiding principle for the genre, has been very much disputed since the early works by Flaherty (see Barsam 1992, Winston 1995), but the evolution of the documentary suggests that, even in later stages, there was a sense of either adhering or separating from those precepts. In all, and even if a historic approach to documentary (as Nichols' modes of representation suggest) could illuminate the functions that the genre has come to fulfil, the evolution of the genre demonstrates that it remains a 'fuzzy concept' (Nichols, p. 21) to define.

As this section has aimed to explain, the documentary genre is inherently expanding based on Flaherty's notion of the 'creative treatment of actuality', pushing the boundaries of documentary with the exploration of new topics, voices, and media. Nonetheless, and at the same time, this 'creativity' in the documentation of reality, although being subject to discussion from the early days of the documentary, remains a central motif and a centripetal force in its configuration. This can be extracted from the fact that the label 'documentary' has remained intact throughout history, although it has come to designate an ever-

changing form which was already ‘fuzzy’ in its earlier representations. Accordingly, and more than the author-centred ‘creative drive’, there might exist a complementary ‘principle’ to it which equally underlies the creation of documentary and keeps the documentary form bound, but, more importantly, accounts for the dynamic nature of the genre while observing its limitations in what ‘representing reality’ effectively is. Section 1.2 will consider the ‘contractual’ relationship with other agents, especially the audience, as the factor that determines the overall configuration of the genre and which transcends the purely individual ‘creativity’ that emanates from more rigid notions of authorship.

1.2. THE ‘DOCUMENTARY CONTRACT’

The embodiment of the aforementioned relation between authors and audiences that is established in the documentary’s creative treatment of reality is what Skartveit (2007, p. 38) refers to as the ‘Documentary contract’. For the purposes of this thesis, and as section 1.3 will show, the Contract is fundamental for understanding the articulation of the documentary genre and the social action it fulfils.

The discussion of the forms of ‘creative treatment of actuality’ in the previous point inherently drives towards the consideration of the audience as a shaping factor in the configuration of the documentary. For instance, Nichols overtly considers the presence of the audience in his definition of documentary as representation by defining documentary through ‘institutions, practitioners, texts, and *audience*’. McLane, on her part, when discussing the purposes, viewpoints, and approaches of the documentary, also evidences the audience as a target for documentaries to ‘persuade to hold an attitude’ or ‘take some action’ in relation to the subjects of documentary. As subsequent discussion will try to show, both academics and documentary practitioners evidence the need for a tacit agreement between authors and spectators to be reached in order to ‘participate’ in and configure the documentary diegesis ‘as it is’ in its practice, more than relying on rigid and presupposed definitions. Still, the concept of ‘creative treatment of actuality’ is

useful for defining the 'Documentary Contract'. But what does the notion of 'actuality' (and 'reality and objectivity') imply in the context of documentary filmmaking? The first clause of the contract addresses these issues in relation to the claim on objectivity which documentaries are said to have.

1.2.1 Documentary Contract Clause 1: Truth and Reality

Index and naturalism

As Nichols (2001, p. 24) notes, "John Grierson's famous definition of documentary as 'the creative treatment of actuality' undercuts the very claim to truth and authenticity on which the documentary depends". Indeed, addressing actuality creatively seems to be at odds with what the documentary seems to represent with its 'discourse of sobriety' (Nichols, 2001) and the "implicit duty of every documentary maker to stand by the *accuracy* of the films' claim to truth" (Kriwaczek, 1997, p. 42). Documentary filmmaking, on the part of producers, needs to satisfy this requisite to 'truth' that has come to be accepted in the configuration of the genre as part of correct and ethical documentary practices: in that sense, Rabiger (2014) states that ethnographers are confronted with assumptions to truth that must be met as part of the documentary production when keeping the 'mutual agreement between the audience and the artwork'.

The Documentary Contract's 'Truth' clause appears to be founded in two technical factors that are echoed in and conditioned the evolution of the genre. The first of the factors is associated with the Peircean notion of the 'indexical power of the image' and its 'physical correspondence point by point to nature' (Peirce, 1960; Nichols, 1991, p. 149). Peirce's classification of *icon*, *index*, and *symbol* is useful in transcending a static view about referential representation by classifying visual inputs into different signs: 'icon' refers to physical *resemblances*, 'index' to *evidentiary* representation, and 'symbol' to an *arbitrary* relation between signifier and signified. In this sense, the claim to objectivity through the indexical nature of photography seems to resonate more strongly in the earlier stages of the configuration of documentary with the audience's fascination for the capturing of life and *actuality* 'as it was' based on the unprecedented exposition of

photographical footage. The overall effect on audiences of documentary's 'indexical intensity' is that 'camera does not lie'. This claim is pivotal to the second factor, that of camera mediation in the recording of reality. Chapman (2009, p. 49) uses this statement in order to discuss the extended documentary stance towards 'field naturalism' (a concept used in Corner, 2002, p. 256), which was central to the claims of documentary movements such as Cinema vérité and Direct cinema in the period from 1958 to 1970: field naturalism considered the camera as a passive instrument, only set to apprehend reality as it *truly* was in its *natural* course⁴.

As explained above, the documentary form has been traditionally associated with a series of technical features and subsequent filmmaking practices that ensured the claim to objectivity that is *presupposed* during the viewing of these films. But, more than on the part of filmmakers, the concept of 'presuppose' (or 'assume') is fundamental in that it points towards a stance that must be taken on the part of the audience in considering what is presented as *true* or *evidentiary* (*documentary*, in all). In other words, and as Beattie (2004, p. 12) puts it, the 'constituency of viewers' (Nichols, 1991) engages the documentary with a 'set of expectations regarding the work's authenticity and veracity'. In that sense, how is documentary reality constructed, or even glanced at, based on the presupposed conditions that are at interplay between audience and creators?

Multiple realities, un-reality, or non-documentary?

Some documentary genres, such as mockumentaries, prove that the impression of reality can be achieved by the crafting of documentary-like rhetoric, thus opening the question for what reality means in the context of inherently performative audiovisual genres.

The problematisation of the meaning of reality for documentary filmmaking, and its impact on the Documentary Contract and spectatorship, has witnessed different approaches. On the part of filmmakers, Rabiger (2014, p. 11) hints at the

⁴ McLane (2012, p. 221) provides the background for this movement, which was based on earlier intents to capturing 'natural sounds and scenes' that had been present in Flaherty and Grierson's early endeavours and in other radical stances, such as Marxist filmmakers' of leaving footage uncut in order to alter reality in the lesser part (Rabiger, 2014, p. 95).

‘real’ issue by stating that filmmakers should aim at “being consistent with *the* reality and evidence presented to the audience”. This quotation opens the field for discussion about multiple realities. In this line, Beattie distinguishes between different types of reality that come into play in the different stages of documentary production: *putative* (or phenomenological, that is, the ‘general’ reality), *profilmic* (the reality in which the camera is decided to be set), and the reality that is perceived in the act of watching or screened (p. 14). This interplay of multiple realities becomes more entangled when Blouke (2015, p. 6) expands this discussion by highlighting the increasing instability between ‘real and representation’: by examining the case of mockumentary *Borat: Cultural Learnings of America* (in which a fictional persona from Kazakhstan conducts interviews with *real* people from the USA with *real* opinions about issues such as women oppression or gun rights), Blouke states that the boundaries between the real and representation come to blur in the documentary performance.

Other approaches do not consider this as a matter of multiple realities, but as one of ‘un-reality’ (McLane, 2012, p. 370). For Renov, (1993, p. 2), reality is inherently fictive since the choice of what and how reality is recorded (aforementioned camera mediation) is not objective. This approach contradicts the very claims to objectivity that Cinema Verité could have, and restates the debate on ‘truth’ as the entity that must be confirmed in the diegetic relation between narrator and audience (‘coherent frame of observation’, Corner 2018, p. 71), thus rebating the *pre-assumed* character of the Documentary contract’s first clause. More radical stances state that the notion of ‘documentary’ is erroneous if based on the premise of truth. Godmilow’s (2002) article titled *Kill the documentary as we know it* evidences that the idea of “sober, unauthored texts [...] in which the world *tells itself*” is fallible. Additionally, Minh-Ha’s (1993) views on documentary’s ‘totalising quest for meaning’ concludes that “there is no such thing as documentary” (p. 90): the ‘documentary’ domain is restricted to an ‘aesthetic of objectivity’ (p. 94) which, in order to properly function, should be not only reflective in its ‘illusion of reality’, but also in the ‘power it exerts’ and emanates from the socio-historical status conferred to the genre (p. 107).

A solution to the debate about reality can be founded on the active role of the audience: although truth can be presupposed on the side of spectators as part of the Documentary Contract, the decoding of the filmed truth is ultimately up to them and their activity (Chapman, 2009, p. 134). In fact, and as Chapman states, “the contract never promises to avoid manipulation altogether: people make varying interpretations of what they see in a documentary” (p. 145). Minh-Ha and Renov, from their different stances, intersect in the implications of granting documentary’s authority and power, and the contract with the audience. As Renov (1993) claims:

The nonfiction referent’s ‘historical status’ is arrived at through a complex set of relations among perceiver, material, signifier, signified, and referent rather than *awarded a priori*. This status is neither fixed nor absolute and can be remanded on the basis of subsequent knowledge. (p. 193)

Both Chapman’s and Minh-Ha and Renov’s ideas reinforce the sense that there is more to documentary and its configuration than pre-assumptions, but rather, an active role on the part of the audience (either generally or individually, a matter which will be discussed in section 1.2.2) which ends up determining whether something is true or not; that is, determining what is *documentary* (using the word as an adjective, as in Corner, 2000) and what is not.

The implications of what reality means for the first clause of the Documentary Contract seem to contradict the configuration of the genre itself, since the core subject matter and condition (either ‘truth’, ‘reality’, ‘objectivity’, or ‘evidence’) of the genre seems to be ungraspable. But if truth cannot be assumed to be the enabling condition for documentary, what is the condition that considers the active role of the audience as more determining in the configuration of the genre?

1.2.2 Documentary Contract Clause 2: Edifying Actively and Challenge

Taking action and Edifying Actively

The Documentary Contract’s clause on truth has proved too unstable in its relation to audience to be considered the core relation that articulates the genre and its goals. Godmilow (1997, p. 81) points toward this generic instability by questioning:

“How can such a wide categorisation of documentary based on what is real and what is not be established?” This is not to say that claims to authenticity do not have any importance in the configuration of documentary (audience *assumes* ‘truth’ as part of the set of expectations in the perception of documentary), but it suggests that the genre may be founded on other pillars that defy the ‘authenticity’ claims that emanate from the ‘indexical power’ of documentary.

In this line, authors such as Thompson (1995) stated that, more than the ‘indexical power’, there exists a ‘symbolic’ potential for media to “intervene in the course of events, to influence the actions of others and indeed to create events, by means of the production and transmission of symbolic form” (p. 17). The notion of ‘influencing the actions of others’ appears in McLane’s (2012) and Skartveit’s (2007, p. 41) ideas about the Documentary Contract under the notion of ‘taking action’. In the context of documentary film, ‘taking action’ involves increasing “our understanding of, our interest in, our sympathy for their subjects, and perhaps our future actions”, and implies an approach on the part of documentary makers to ‘interpret actuality in order to inform and persuade to hold some action’ (McLane, 2012, p. 2). Documentary’s representation of the world, according to Austin (2007, p. 178) is then a form of “mobilising practices of distinction, disgust, or denial”.

On the part of documentary makers, there has traditionally existed a consideration to this ‘symbolic power’ used to persuade that can be exemplified in early instances such as Grierson’s films or Vertov’s *kino-pravda*. Identifying the genre as a tool for ‘education of the masses’, as Vertov did, involved not only the fulfilling of the human ‘desire for epistophilia’ (that is, the craving for information and knowledge for the sake of itself, as explained by Lebow, 2006, p. 6), but also a compromise to question the perception of the world and reality through the documentary’s symbol. Renov’s (1993) rhetorical/aesthetic functions also involve a ‘modality of persuasion’ (p. 30) which is baselined on the grounds of ‘truth claims’. This illustrates that the divide between the Documentary Contract’s clauses is not clear-cut, but rather exists as a continuum. As Rabiger (2014) puts it:

A film like this does not set out to celebrate, sell, or convert, but rather to expand the viewer’s mind and emotions. It does this by drawing us through

a series of events fraught with emotion, meaning, and ambiguity. It lets us draw difficult conclusions about motives and responsibilities, and takes us along as accomplices in a painful quest for truth. (p. 11)

This stance of 'taking action' demands from the audience that reflection about the subject matter is overt and active. In this line, Godmilow (1997, p. 81) considers that the objective of the documentary must surpass the 'educating' intent in order to focus on the 'edifying and instrumental': creating an 'audience of individuals who can learn some conceptual tools to articulate a critique' is what the documentary's intent should be. Rabiger, in this way, additionally points out what follows:

The contract is no longer just to absorb and be instructed. Instead, the invitation is to interpret and weigh what you see and hear. The film now sometimes uses action to illustrate, and other times to contradict, what has been set up and what has seemed true. (p. 438)

The relation of the documentary form with the audience is now narrower, in that it not only surpasses the pre-conceived notion of 'truth' and 'education', but also involves spectatorship in the active decoding of their reality by the provision of analytic tools based on the symbolism of the image.

Challenge and Emotion

Corner (2018) takes further the notion of the active decoding of the documentary materials within the 'taking action' intent by introducing the notion of 'challenge'. Corner explains that, as part of a documentary's strategies in the application of the second clause of the Documentary Contract, the demanded increase in mental work on the part of the audience encompasses the portraying of the problematic 'referential status of the material' (p. 59). The author states: "A challenge that will encourage—if not force—serious reflection on the processes of mediation and understanding themselves, and the choices, tensions and even contradictions these involve" (p. 59). Challenge can then be connected to the mockumentary notion of 'subversion'. In the documentary challenge, spectatorship is given the set of tools (in Godmilow's words) that will not only result in a deeper analysis of the

documentary form and its structure, but also in a 'taking action' in a world which is presented as problematic in the different perceptions of what reality is.

Challenge also functions on an emotional level parallel to the aforementioned cognitive side. Renov (1993) asserts that persuasion not only works for the merits of 'demonstrative proof', but also because of its appeal to emotions (p. 30), something which contradicts Nichols' (2001) notion of documentary following a 'discourse of sobriety' that could restrain over-aesthetic innovation (and a founding principle of the Documentary Contract's 'Truth' clause). Corner explains that, parallel to the cognitive challenge presented to the audience, there exists an emotional 'compensation' that lures spectatorship into the film. Accordingly, the 'aesthetic-affective pull' (p. 65) contrasts with the cognitive challenge, but is inherently an accomplice in the challenging construction of the treatment of the subject and the ultimate 'taking action'. What Corner treats as 'emotional investment' is taken up by Godmilow and described as the 'Thank God that's not me' feeling: as part of the documentary's edifying process, there exists an emotional safekeeping for the audience to identify itself as 'not part of the problem, but of the solution'. Accordingly, challenge, in a greater or lesser degree, relies on the affective side of spectatorship to fulfil the 'taking action in the world' clause.

Although the conditions for the second Documentary Contract's clause seem balanced enough to establish a closer relationship with the audience, some considerations should be taken into account in producing a defining notion of the genre based on it. Firstly, emotion is connected to a series of non-epistemic values that may clash between different viewings of the documentary genre. According to this, the interests of the documentary may come to conflict with audience's expectations, which could feel 'manipulated' (Chapman, 2009, p. 137) or not compelled enough by the call to action. Moreover, and on the ethical side, there exists the claim that documentaries could promote the "absorption of values that reveal dominant media representations" (Gillespie, 2005; Chapman 2009 p. 144). Minh-Ha (1993) acknowledged that, in the 'totalising quest for meaning', documentaries usually failed in their reflexive intent by not assuming the power they had as narrations which profess Western media values, something that

clashes with an increasingly wider spectatorship in the digital era and challenges the ethics of the call for ‘taking action’.

Both the ‘Truth’ and ‘Taking action’ clauses present some inconsistencies if considering them to function per se as the determining configuration for the documentary. Accordingly, providing a context which accounts for the different effects of the documentary’s communicative strategies and rhetoric in the relation between filmmakers and audiences may prove useful in examining both clauses. In doing so, the purely *Documentary Contract* can be situated as a *Communicative* which accounts for the social and cognitive side of the documentary and bind the genre form together. Hence, the next section will explore the communicative side of the Documentary Contract and the influence of the digital context in its articulation.

1.3. THE DOCUMENTARY GENRE IN THE CONTEXT OF WEB 2.0

1.3.1 Documentary Contract as Social Action

Why is the discussion on the ‘Documentary Contract’ necessary for the purposes of analysing the genre as such? According to genre theory, and within the branch of Rhetorical Genre Studies (RGS), there exists a concept that collects a similar notion of ‘regular’ discourse practices dependent on a community of agents (which, in this case, shape the documentary). That notion is defined by Miller (1984) as *social action*, or the “typified rhetorical actions based in recurrent situations” (p. 31). Miller’s concept offers an initial approach to defining documentary as a ‘genre’ in that it correlates with the Documentary Contract in assuming a certain structuration of rhetorical strategies (as Bawarshi and Reiff explain, based on rhetorical criticism; 2010, p. 69). These strategies are pragmatically aimed at instantiating typified or recurrent action on the part of the recipient (based on social phenomenology). The diachronic reinstatement of this process ends up providing the genre with the functions of ‘cultural artifacts’ that “can tell us things about how a particular culture defines and configures situations and ways of acting” (Bawarshi & Reiff, 2010, p. 72). In this sense, these instantiations could

ultimately replicate the issues of acculturation proposed by Minh-Ha (1993) and the cultural power and status of the Western documentary form.

The configuration of the documentary obeys to patterns of perception and definition on the part of the audience. Miller's considerations about genre being not only perceived, but also *interpreted* and thus, constructed by the audience (1984, p. 70) are found in similar approaches such as Rosch's prototype theory (1983) and Bazerman's (2004) considerations about 'psycho-social recognition phenomena', which implies that, in order to convey meaning, genres must be 'attributed psychologically' by creators and audiences; for this process to be repeated from other individuals, "the social types of genres must circulate socially and be typified socially". Regarding their connection to documentary, and firstly, the notion of 'genre membership' and recognition through different approximations (or prototypes, based on the degree of similarity) on the part of receiver lies at core of the configuration of the documentary as a genre, and highlights the role of the audience in this respect. Second, and related to Bazerman's approach, considering the documentary's use of metaphor as both an articulator of human reasoning and a carrier of the social status of a genre capable of 'examining reality' can be related to Bazerman's claims that typifications can (1) "give writers symbolic means to make sense of things; in turn, those means of sense-making help set the stage and frame possible action" and (2) "help establish sites of shared cognition wherein our sense-making procedures interact with others' sense-making procedures" (Bazerman, 1994, p. 19). These approaches indicate that documentary, it being a typified form arrived at and configured through audiences' perception and definition, includes an inherently present role of symbolism (that stems from the typification of the documentary genre and enables the 'Truth' condition of Documentary Contract) that is in turn instantiated in how different sense-making procedures intersect.

The multiplicity of procedures for sense-making emanating from individual perceptions and interpretations, together with what the historical condition of the documentary as a genre and cultural artifact implies, as earlier discussion has shown, lead to the documentary's adoption of different shapes through time. More

importantly, it also points towards a shift in the sociohistorical conditions that have marked the varying focus and subject matter of the documentary and audience's interpretations. The need for a genre to address this "construing of objects, events, interests, and purposes that [...] makes them [...] an objectified social need" is what Miller refers to as *social exigence* (p. 30). The consideration of social exigence in the history of the documentary can be helpful in analysing the social conditions that marked the evolution of the documentary genre. For instance, documentary modes (Nichols, 2001) can serve to delimit the progression of the documentary based not only on the conventions and traits that characterised it, but also on the different social, historical, and technical constraints that marked different stances on the production of this genre⁵ (for example, the evolution towards the last mode, the performative, suggests that documentary could no longer push forward naïve claims to truth and, consequentially, shifted its narrations towards others which would not argue for its validity; this could be based on an increased 'resistance' on the part of the audience to more overt persuasion techniques, as Chapman, 2009, claims.

As seen, genres are, inherently, "sites of contention between stability and change" (Berkenkotter & Huckin, 1993, p. 481) between different agents given the aforementioned conditions, but the advent of Web 2.0 has further complicated the panorama for generic classification. As Giltrow & Stein (2009) explain, "the Internet enables a new communication setting which reconfigures the conditions to which pragmatic features of language respond". And subsequently, not only should synchronic (current) 'pragmatic features' be taken into account within this paradigm, but also how, over time, the balance of stability and change is facing rapid evolutions produced in the digital environment.

⁵ It should be noted that a genre such as documentary should also account for an artistic dimension: this discussion can be related to Miller & Shepherd's (2009, p.286) views about earlier theories on 'piety' and 'schemas of orientation' (see Burke, 1965; and Schutz, 1976, respectively). Social exigence, on the one hand, is met by the documentary in a functional manner, an *extrinsic accommodation* towards the typified rhetorical action and the recurrent situation that *demand*s it; on the other hand, there exists an *intrinsic accommodation*, a 'merging of substance, form, and style into an aesthetic whole' that also conditions the configuration of the documentary genre.

These evolutions over time end up reconfiguring the form and substance of different genres, mostly because of their effects on the configuration of audiences and how they are brought together in different contexts by social media technologies (*context collapse*, Marwick & Boyd, 2011, p.3), or in the adaptation of different rhetorical strategies of different texts and genres into another (*genre hybridisation*, Mäntynen and Shore, 2014, p. 738)⁶. From a point of view of temporal development, analysing genre in Web 2.0 becomes a matter of examining how *evolution and emergence* (Miller, 2016) provide different stances in understanding generic stability and change. In order to examine stability and continuity, Miller states that “*evolution* can help conceptualise the processes and mechanisms by which variations come about and are replicated and propagated”. Conversely, ‘*emergence*’ explains genre innovation taking “that unrepeatable contingency constitutes the default condition” (p. 16).

In the case of the documentary, the concepts of innovation and emergence further complicate the classification of a genre that not only is problematic in being defined through its social exigence and social action, but that should also examine the Documentary Contract in the context of how Web 2.0 has influenced the relations between creators and audiences as its enabling condition. Miller (2014) points out that “the internet introduces a new arena with less control and regulation than academic disciplines and corporate or government (or educational) organizations [...] we find voluntary activity, user-generated content, emergent communities of use, and much experimentation and play” (p. 61). Hence, once again, it is possible to claim that it is the communities of use and their practices (and in the case of documentary, the audiences) that determine the end product that is subject to evolve or emerge from the Web, as will be further discussed in section 2.2.2 of Chapter 2. Accordingly, what is the nature of this relationship within these rhetorical communities in Web 2.0 from the point of view of genre theory?

⁶ Chapter 2 explores these issues in more depth.

1.3.2 Rhetorical communities in Web 2.0

Genre theory also explains the different processes that occur within communities of use of different genres. An approach to this issue was established by Swales (1993), who defined ‘discourse communities’ as “sociorhetorical networks that form in order to work towards sets of common goals” (p. 9). Additionally, he distinguishes six defining characteristics: an explicitly or tacitly agreed set of common goals, mechanisms of intercommunication, members’ use of these mechanisms, possession of a genre in the ‘communicative furtherance of its aims’, specific linguistic forms, and degree of expertise (adapted from Bawarshi & Reiff, 2010, p. 44, see also Swales, 1990). The relation between audiences and creators in the documentary is susceptible of being analysed under this optic, considering how the Documentary Contract fulfils this definition in terms of the communities’ goals, use of the genre, aesthetic constraints on forms (including linguistic), and the expertise emanating mostly from the creators. But in the context of Web 2.0, the mechanisms of intercommunication that Swales defines for discourse communities could be affected in how the agents establish communication. The point for departure in analysing how the Web 2.0 paradigm influences communication in documentary can be found in Miller’s (1994) concept of *rhetorical communities*.

Rhetorical communities transcend discourse communities in that, rather than taxonomic (common behaviour) or relational collectives, they are ‘virtual entities’ (Miller, 1994, p. 73). Miller’s claim is formulated on the grounds that interaction cannot be assumed on the part of the different agents that participate in the configuration of the genre, at least from a relational perspective - in the documentary, is there always a channel of communication between audiences and creators permanently established in order to fulfil the Documentary Contract, and does that impede the existence of the genre?. Miller, in assuming that these relations are ‘virtual’ and projected in rhetorical discourse hierarchy (rather than projected in space-time and being awarded a priori, as discourse communities suggest), accounts for a vision of agents’ relationships within genre that suits better

the context of Web 2.0 and the complex characterisation of audiences and their behaviour.

In that line, it is useful to highlight Miller and Kelly's (2016) concept of *community of use*. In the context of the Internet, genre characterisation is increasingly difficult given the difficulties in identifying audiences and core genre features, as favoured by the dynamics of Web 2.0 (see next section). By introducing the concept of 'communities of use', which favours a *pragmatic* and 'insider' (*emic*) approach (rather than formal) to functions, actions, and interactions occurring in a rhetorical community (p. 270, 278), Miller and Kelly define 'genre use' as the result of how those interactions are materialised and consider it as the characterising trait of genre. In all, the concept of 'communities of use' reinforces the idea that audience's interaction, as projected in discourse, affects the use of the genre; in turn, this genre usage is what defines genre.

With the concept of rhetorical communities, additionally, Miller puts into play the issue of genre evolution and emergence by characterising rhetorical communities as 'fundamentally heterogeneous and contentious' (p. 74): by drawing on Giddens' (1984) structuration theory, Miller explains that although 'social order and continuity' constitute the anchoring for a genre to exist as such, structuration requires this order to be further instantiated through time and based on the rhetorical actions of further different participants within the genre in order to 'survive' and extend in time. Miller not only puts this genre innovation in a timely perspective, but also assumes the 'otherness' and innovation that inherently emanate from rhetorical participation in assuming change (contention) and stability as necessary conditions for genre to exist. In this respect, the definition of rhetorical communities can account for the specificities of both the nature of the relationship between participants in the configuration of documentary, and the ever-changing context of Web 2.0.

The documentary as a genre needs to be based, as explained above, on a definition of the community of both creators and audiences and its evolution in Web 2.0. So far, this analysis of the issue of rhetorical communities in the configuration of documentary is merely preliminary. Nonetheless, it offers an opening approach to

examining the relation of these communities of practice with those changes that have occurred in the later development of the documentary and constitute a reshaping of the social conditions that determine the genre. The following section examines how different production practices and ramifications of the Open Science movement have provoked a shift in the documentary paradigm.

1.4. INTERACTIVE DOCUMENTARIES (IDOCs)

1.4.1 New production practices towards the IDoc

In order to understand the rhetoric of the documentary genre and its form and substance as a result of the exigences it responds to, it is worth remembering that although the documentary has still been produced for the traditional media of television and cinema, filmmakers have started to embrace the adaptation of the genre to the web when considering the interactive capacity of the medium as a possibility for expansion of the genre. How this main affordance has affected the rhetorical form and (semantic) substance of this genre is evident in the creation of the label IDoc (or i-doc, the ‘i’ standing for ‘interactive’)⁷, which can be revealing in that it can be approached and defined from different points of view: the technical, the productive, and the conceptual.

Regarding the *technical* side of documentary’s evolution in the context of the Internet, Gifreu Castells (2013, p. 191) indicates four stages: (1) offline IDoc, (2) experimentation with different supports, (3) consolidation and widening of supports, and (4) diversified production. The different affordances that the Web has developed over time, Castells claims, correspond to an evolution of the documentary form through different media and dynamics of production that were intrinsically demanded by the architecture of the Web. In the entrance from the first stage into the second, Castells claims that the use of optical storages became

⁷ It should be noted that the existence of IDocs runs parallel to that of the matrix documentary genre. Several authors will be brought to the fore in further sections in order to illustrate the problematisation of the IDoc as a genre specifically designed for the affordances of Web 2.0 or as a transmediated genre; for the time being, this thesis will address preliminary issues related to a specific realisation of the documentary genre.

obsolete when the introduction of the World Wide Web as a platform for generalised use came to the fore: accordingly, documentary narrations such as *Moss Landing* (1989), which offered a limited range of pre-established actions for the audience to follow the story and depended on physical storage to work, were succeeded by narrations which exploited the hypertextual nature of the Internet to enrich their storytelling. These and other multimodal genres (grouped under the term of *parascientific* genres) that have appeared in Web 2.0 will be further discussed in Chapter 2 in order to illustrate the technical developments they share with the target genre for this analysis. Similarly, the evolution of documentaries was accelerated in the step from Web 1.0 into 2.0: where Web 1.0 IDocs made use of the existing conditions of the Internet as a database for storage of multimedia information, Web 2.0 IDocs developed integrated additional functions similar to those featured in social media. Especially in this third stage the dynamic interaction between components of social exigence into the conformation of the IDoc genre is crucial: probably, documentary rhetorical communities identifying social media as a tool for increased individual expression through greater and more personalised networks detonated not only a rapid transition towards platforms that included social media-like features, but also inherently determined the different contents that were more apt to appear within this favoured architecture. In other words, how the IDoc configured its thematic focus came to be partly dependent on the technical features that enabled new communicative possibilities.

The discussion on technical issues that conditioned the evolution of IDocs opens up questions of *production* practices within the Internet paradigm (and its economic dynamics) in considering these films as marketable products. The Internet reproduces and is instantiated by a 'participatory culture' (Jenkins, 2006) based on 'expression, affiliation, and circulation' with regard to the artefacts produced. Dovey (2014) argues for this participatory culture that lies at the core of the documentary culture to be susceptible to undergoing the same market dynamics that characterise other Internet 'products'. Accordingly, the participatory nature of these genres (favoured by Web 2.0 architecture, as explained in Chapter 3) turns into an opportunity for 'exploitation' to occur, and

as Dovey explains, what could be interpreted as a ‘desire to democratise the process’ could turn into the “necessity of finding a critical mass of attention to sustain the project” (p. 17). The social exigence of documentary is then positioned within a balance of different processes:

Participation is driven by the necessity of attention aggregation as much as by any desire or need to open up or democratise production processes. This landscape shapes the necessarily intertwined processes of collaboration and extraction in social media, fragmentation and aggregation of media content and decentralisation and control of power. (p. 19)

From the *conceptual* point of view, authors such as Corner (2002) emphasise a change in the situation of documentary filmmaking towards the so-called ‘postdocumentary context’ (p. 263). Resulting from the aforementioned dynamics of production, Corner claims that documentary, in all its formats and media, has evolved towards a form of ‘popular factual entertainment’ that arises from the instability of the factual programming market. Subsequently, the ‘uncertainty and risk about who wants to watch and why’, Corner claims (p. 264), has driven documentary towards a context of aesthetic instability, in which documentary has not sufficient generic authority because its features have borrowed and become borrowed from other non-documentary films’.

What these changes show is that collaboration, in its different dimensions, arises as the phenomenon that binds the IDoc together. In terms of genre theory, collaboration can be analysed as the ‘objectified social need’ that is required for the documentary form to exist. Collaboration implies a development of relations between the different actants (human and material) that participate in the documentary genre. In that line, Gaudenzi (2012) underlines the value of IDocs as ‘relational objects’, defining IDocs by their demand of ‘agency and active participation of some sort from more than one actant’, therefore “putting several entities in relation with each other” (p. 15). In a similar way to traditional documentary filmmaking, IDocs find their definition in the networks that are established between actants; as a difference, they include the architecture of the Web as an additional actant. Manovich (2001) emphasises the role that ‘modularity’

(that is, the linking between digital objects such as files put in relation within a digital genre) adopts in the configuration of the IDoc; as a result of independent user manipulation of these entities, the architecture of Web 2.0 and its modularity enables generic variability. Collaboration is not the only mark of the conceptual development of the IDoc: Dovey (p. 13) also highlights the fact that by increasing the means for collaboration between actants within the dynamics of social media, there is an effect of 'creation of public domain' that conditions what is considered as 'documentary' and what is not. The rapid dynamics in which public collaboration determines actuality may be the cause for Corner's claim to current documentary's generic instability. Permeating this conceptual and technical dimensions is an 'economy of contribution' (Stiegler, 2010) that now guides the production and exploitation of documentaries in a context of 'Cloud ecology' (Coley & Lockwood, 2011), where "the networked body of the social feeds off the body of capital while it, in turn, is nourished by that very body of the collective" (p. 52).

The flair of collaboration permeates through the different dimensions (productive, technical, conceptual-aesthetic) that have helped configure the genre of IDocs in Web 2.0. But rather than considering it as an independent occurrence, this thesis will try to bind it to the phenomenon of Open Source as the movement that has further maximised the collaborative nature of the digital medium.

1.4.2 IDocs and Open Source

Open Source is intimately connected to the issue of collaboration as a core generic feature of IDoc, in both its social exigence and rhetorical communities. Open Source, within the broader paradigm of Open Collaboration, advocates the generation of programming code and its free distribution for the purposes of software development (Levine & Prietula, 2014). But although the technical specificities of software may be distant from the cultural aspect of the IDoc, a relation can be established based on the patterns of collaboration that are unlocked by the former into the configuration of the latter. As Lanzara & Morner (2003) claim, the main affordance of open-source software is the "accumulation and dissemination of knowledge in spatially diverse settings where project membership

is fluid and participation is volatile” (p. 1). These characteristics of Web 2.0 resonate in Miller’s definition of rhetorical communities: open-source software enables the existence of a pattern of relationships to *potentially and virtually* occur between different actants. The critical point in this consideration is the way in which open-source software enables these affordances. Authors such as Kogut and Metiu (2001) state that this software’s development is “decentralised, highly interactive, knowledge-intensive, and apparently unmanaged” (p. 258). Nonetheless, and at the same time, the nature of the communications that are established between participants is more than ‘task-oriented’: it makes them look like communities (Lanzara & Morner, p. 1). The consideration of this process as being managed by networked communities is pivotal to how the IDoc project is developed in discourse, ultimately addressing the fulfilment of the social action of the Documentary Contract in Web 2.0.

The case of Brett Gaylor’s *RiP: A Remix Manifesto*, as explained by Gaudenzi (2013, p. 186-189), can be particularly revealing in defining Open Source as crucial in IDoc and its users. Gaylor and other filmmakers, stimulated by how the Open Source movement had functioned as an inspiration for the specialised community of hackers to work together, wondered whether this software-based peer-sourcing work could be extrapolated to peer-production work in the filmic industry. Accordingly, Gaylor set out a documentary structured as a participatory project based on opening the Internet affordances to wider audiences. By ascribing this pattern of production to the documentary form, Gaylor added an aesthetic dimension to an idea that worked purely in functional and technical terms, that is, the opening of code for a machine to read it. Initially, Gaylor conceived ‘collaboration’ in his project as simply ‘asking people to remix’ the rushes that had been previously filmed. Observing that this had not worked, Gaylor decided to engage the professional community of re-mixers (mainly from YouTube): for them, he created a ‘contest logic’ in which they were challenged to create a better product than him while, at the same time, they were taking on major tasks for the development of the project. What Gaylor learned was that the project needed to create different levels of participation: in order for the structural challenges of the

documentary to work, he resorted to ‘hardcore collaborators’, but in order to ‘keeping the project honest’ (in Gaylor’s words, which remind of the ‘Truth’ clause of the Documentary Contract’), he required participation on the part of wider, less expert audiences. As explained earlier, rhetorical communities function in discourse *hierarchy*. And *RiP: A Remix Manifesto* constitutes an example of the configuration of these communities through the Web 2.0 context: it is evidenced how the hierarchisation of participants (while ones were performing tasks that required ‘expertise’ in the field, others simply contributed by adding more material) which were *virtually* part of a project ended up forming a community of use which was defined through the networked affordances of the Internet. But, most importantly, the community was also demarcated by the return of a cultural artifact which acknowledged the Documentary Contract as the social exigence and action that gave this IDoc its generic status through its participatory production in a hierarchised manner.

This section has aimed at demonstrating that collaboration in the context of Documentary creation in Web 2.0 implies the opening of technical features of the digital medium to the target communities; nonetheless, the process is distinctively hierarchised and points towards a new role of what being an author, creator, or audience means when considering the IDoc genre. Although this point will be studied in more depth in further sections of this thesis, addressing the wider ideological implications of the Open Source movement may be an appropriate way to frame what documentary means in the changing scenario of Web 2.0. The beginning of this chapter formulates the documentary through its defining trait of the Documentary Contract; the final sections push this notion towards issues of genre characterisation within the ‘Cloud ecology’, raising questions about what documentary filmmaking implies in terms of functioning of its communities of use and its accordance to the social demands of the digital medium. This wide panorama and its implications for documentary will be analysed in the following chapter under the optics of two major cornerstones: the domain of scientific disciplines, and the Open Science movement as the breeding ground for the increasing democratisation of science communication practices.

CHAPTER 2. DOCUMENTARY AND SCIENCE

This chapter is dedicated to scrutinise *the relation between the documentary genre, on the one hand, and scientific communication, on the other*. The questions that lead this exploration are the following:

1. How is the relation between documentary and science articulated through the Documentary Contract?
2. How do Science Documentaries evolve into the 'Open Science' paradigm of Web 2.0?
3. What is the place of the ISDoc (Interactive Science Documentary) among other digital genres intended for science communication?

Section 2.1 within this chapter examines how the traditional identification of the documentary genre with science may be flawed if attending to how truth is 'constructed' and assumed by audiences as preliminary conditions, and also because of the inherently fictional (representational) use of technologies such as CGI. Following this, sections 2.1.2 and 2.1.3 explore the evolution of the Science Documentary and how these epistemic issues come to be foregrounded through its so-called 'rose-tinted' discourse (Fothergill, 2006).

Drawing on its definition as "transparent and accessible knowledge that is shared and developed through collaborative networks" (Vicente-Sáez & Martínez-Fuentes, 2018, p. 7), the second section studies how the ISDoc genre aligns within the Open Science principles as part of a wider 'participatory culture' (Jenkins, 2006) which favours the evolution and emergence of similar genres.

Finally, and as a result of the collaborative practices of the digital paradigm, section 2.2.2 delves into the participation of non-expert audiences in the configuration of the ISDocs and other science communication genres, thus 'eroding the traditional sphere of scientific discourse' (Trench, 2008), hybridising discourses that participate in science communication (Mäntynen and Shore, 2014) and giving rise to the so-called 'parascientific genres' (Kaplan & Radin, 2011).

2.1. SCIENCE DOCUMENTARIES AND THE DOCUMENTARY CONTRACT

2.1.1 The relation between science and documentary

The focus of this chapter is the relation that documentaries have with science, and how this relationship has come to be interpreted and instantiated due to the influence from other audiovisual products occurring in TV, the Web 2.0 context, and citizen movements. Where exactly the science-documentary pairing finds its *raison d'être* is addressed below.

The point of departure for this debate is found in Winston's (1993) consideration of documentary film as *scientific inscription*. The argument for this claim starts from the same principle that was mentioned in the first chapter to operate in the Documentary Contract's 'Truth' clause, the *indexicality* of the camera. Winston's discussion follows the work of authors such as Latour in explaining what 'inscriptions' are for the camera as scientific instrument:

'What is behind a scientific text?', he asks. 'Inscriptions. How are those inscriptions obtained? By setting up instruments'. And what happens when we are confronted with an instrument? Latour says "we are attending an audio-visual spectacle. There is a visual set of inscriptions produced by the instrument and a verbal commentary uttered by the scientist (Winston, 1993, p. 41).

Following Latour's logic, Winston evidences that the act of recording constitutes the audio-visual spectacle, founded on the objectivity of the camera, on the one hand, and the scientist, on the other. This equation is, for Winston, the 'most potent (and sole) legitimation' for documentary's 'evidentiary pretensions' (p. 41); accordingly, neither can documentarists abandon this scientific inscription to their creations since the very 'cinematographical apparatus' is built on them. Renov (1993), on the other hand, is critical about attaching scientific values to documentary. Renov's critique includes Foucault's remarks on science permeating through different discourses (including the poetics of audiovisual production) and the 'totalitarian' assumption that the discourse of science is inherently appropriate to a genre (documentary) capable of examining 'truth'. Science, Foucault claims, is

about description, representation, inscription, and the implication of an inherent 'current' character (which resonates in the early name of 'actuality' films); documentary, in Renov's discussion, needs to transcend this notion if it aspires to represent its objects within 'the dynamics of historical transformation'. In all, an epistemological debate on whether science and documentary are inextricably bound seems arduous to justify this position.

But in the same way that the fidelity of the photographic image cannot be tantamount to its claims to truth⁸ and scientism, neither can technology help in this aspect. Campbell (2016) follows Winston and Renov's earlier discussion on the issue of the camera's objectivity, but shifts from the epistemological to the technological questioning of science, documentary, and truth (something that Winston had already anticipated in 1993 and 2008). Campbell explains that CGI (Computer Generated Images) may constitute an attempt on the claims to reality, and thus, scientific evidence presented in documentary. Some authors have argued against the claim that digital images 'rule out indexicality' (Prince, 2012, p. 149); in fact, and as Moran (1999) claims, "science and documentary share the same configuration and the same epistemological goals: a union of man and technology in search of a 'truth' about the historical world" (p. 258). But the pressure cast on the use of CGI in documentaries is still materialised in some authors' views of the transformation of the genre into the so-called *subjunctive* documentary (Metz, 2008): these documentaries are more focused on 'would be' situations justified by the inclusion of CGI than in the 'factual basis' that should constitute what is documentary.

This section's discussion has tried to explain why the aforementioned 'debate' arises from a troubled relation between science and documentary on a variety of levels which makes it difficult to assume that there is something regular or continuous in the conjoin 'science documentary'. Once again, proving this relation

⁸ Not only should we consider discussion within this section; as seen in Chapter 1 within this thesis, claims to camera's objectivity can be contested because of the inherent subjective position of those that operate it. Discussion of what is considered 'scientific' and not in documentary filmmaking involves a similar logic to that found in Chapter 1, capitalising in audiences' own decoding of producers' assertions as the happening in which considerations of that kind are made.

successful is more a matter of examining its materialisation in discourse and rhetoric than of being awarded a priori. For the time being, exploring how this coupling has been exploited in the history of documentary filmmaking will be the focus of the following section.

2.1.2 A brief account of the evolution of Science Documentaries in TV

The early history of science documentary filmmaking is related to the previously discussed considerations of the camera as a scientific instrument. Early science documentary could be traced back to the recording of operations or other medical procedures, such as Gheorge Marinescu's (see Buda et al., 2009) investigations in the field of neurology. Nonetheless, this section aims at understanding the use of the science documentary within institutional and governmental programs and its posterior transformation into a marketable product.

Lee-Wright (2010) links the institutionalisation of the science documentary to the BBC's endeavours in 'informing, educating, and entertaining' around 1960. What started as a complement to school programs quickly developed into adult education under the guardianship of Further Education Television, developed by the Wilson Labour government (Lee-Wright, p. 151) and the Open University, which took over the functions of the former and created shows such as *Rough Science*. It was a matter of time that these originally educational programs evolved into audiovisual products that occupied a prominent space in television scheduling, and, as McLane (2012) states, "by the end of the eighties there were speciality cable channels for children, every type of sport imaginable, animals, science, home care, history, movies and more" (p. 275). In all, documentaries and other varieties of nonfiction programming attained a goal that had not been reached before. The culmination of this process of inclusion of science-related, factual entertainment into TV can be mostly embodied in Sir David Attenborough's *Life on Earth* (1979) and Carl Sagan's *Cosmos: A Personal Voyage* (1980). The impact of both shows as documentary filmmaking landmarks is to be accompanied by the proliferation of spaces within the TV schedule that would allow for this format to appear and to experiment, as explained by Campbell (2016):

Establishment of dedicated niche factual channels, such as the Discovery Channel (1985), the History Channel (1995), Animal Planet (1996) and the National Geographic Channel (in the UK in 1997 and in the USA in 2001) amongst others, has presented new platforms for science programming, providing spaces for new programmes and also giving archive programmes an extended broadcast life through re-runs and syndication (p. 8).

From that moment, the development of science documentaries would take place under the scrutiny of documentary filmmakers that preserved the model of science documentary that Attenborough and Sagan had created. But this diversification of the target audiences across the multiple broadcasting channels would lead the documentary genre to develop what Kilborn (2003) marks as an 'entertainment orientation', with the inclusion of elements from other programmes such as reality shows more directed towards entertainment and performance. Amidst this shift, authors signalled a 'turning point' in the history of science documentaries (Darley, 2003) with the launch in 1999 of BBC's *Walking with Dinosaurs*. Van Dijck (2006) points out that renowned science commentators criticised the series because the "digital animation overwhelmed documentary intentions" and because "despite its technical novelty, [it] failed to offer a 'new and improved' approach to disseminating scientific knowledge" (p. 6). In a similar fashion to what was commented in the first subsection within this point, the critiques that stemmed from an overuse of CGI led towards a dispute of what was considered factual as the basis for documentary creation and its claims to truth, realism, or scientism.

The development of the science documentary may now be seen as unbridled, as this section has argued, to more sceptical eyes. Venturing into a digital context which encourages migration to further platforms (Lee-Wright, p. 157) may seem risky for a genre which has come to be disputed epistemologically (as section 2.1.1 argued) and lacking in stable features, guidelines, or precepts that are challenged by technology and increasingly diversified audiences. So how is scientific discourse addressed in this new scenario, and in what ways is the treatment of the scientific subject matter addressed so that it allows for the materialisation of the Documentary Contract so that audiences identify the genre?

2.1.3 A rose-tinted discourse of sobriety

For the moment, it is interesting to recollect Nichols' (2001) notion of documentary's 'discourse of sobriety' in order to consider how the rhetoric of science is shaped in scientific documentaries. Nichols highlights the role of the audience and its assumptions concerning the equilibrium between 'the recognition of historical reality and the recognition of a representation about it' (p. 39). That tension (or 'oscillation') is what Nichols defines as *discourses of sobriety*, or "the ways we have of speaking directly about social and historical reality such as science, economics..." (p. 39). What Nichols highlights about this discourse is the 'instrumental' power it encompasses. Chapter 1 discussed the *illocutionary* force which constituted Documentary Contract. Similarly, what scientific discourse entails are 'ways of doing and acting' which, in the context of documentary filmmaking, mesh with the genre's "tradition of sobriety in its determination to make a difference in how we regard the world and proceed within it" (p. 39).

How documentary filmmaking practices have tried to endow their products with this sense of sobriety is visible in the presence of 'tropes' or 'styles' that 'preplan the relationship between words and images' (Rabiger, 2005, p. 369). The most obvious choices concern the narrator and the style in which it delivers its utterances: Chapman (2009, p. 95) states that science producers make these authorial voice decisions early, and end up choosing 'the more formal, usually linear, and 'objective' third person voice' in the tradition of the 'talking heads'. In the other side of the pole, documentarians, Nichols claims, need to be silent as demanded by the 'voice of science', since 'producing accurate documents or visual evidence' implies a detachment by the creators from their product. In all, any kind of approach to the treatment of the subject matter seems to be either silenced or presented in a neutral, 'outsider' tone. The objective sought by the use of these techniques leads to the ultimate 'act of fetishism' in the audience's acknowledging of the Documentary Contract:

Documentary film often invites us to take on faith that "what you see is what there was." This act of trust, or faith, may derive from the indexical capabilities of the photographic image without being fully justified or

supported by it. For the filmmaker, creating trust, getting us to suspend doubt or disbelief, by rendering an impression of reality, and hence truthfulness, corresponds to the priorities of rhetoric more than to the requirements of science. We accept the evidentiary value of images as an article of faith with some peril. (Nichols, 2001, p. 85).

Van Dijck (2006) takes up Nichols' claims and provides an analysis of narrative modes and visual styles in science documentaries. More than the rhetoric of science, Van Dijck is concerned about reconciling "the inherent unruliness of science with the laws of visualisation enforced by a medium primarily valued for its ability to entertain a large audience with moving images" (p. 7). Accordingly, the array of rhetorical and visual strategies that documentaries put into play in science documentaries are mostly embodied in the use of 'Expository' or 'Explanatory' modes, making use of 'elucidation techniques' that include metaphors (to enhance public understanding), and "stitched onto video footage showing actual or symbolic events to produce a realistic or metaphorical effect" (p. 8). In such a context, and tracing this discussion back to the 'turning point' in science documentary', documentarians have started to widen the use of narrative modes due to the incorporation of CGI into their creations. Therefore, apart from the traditional 'Expository' and 'Explanatory', CGI enables the 'Reconstructive' and the 'Speculative' mode to question historical events through re-enactments and wonder about possible past scenarios through digital animation. But the inclusion of CGI not only arises as creators' necessity of expanding their examination, but also obeys to market dynamics of capturing audience's attention through the insufflated sense of wonder that comes from digital imaging (following Dovey's 2014 discussion of attention).

The dangers of ruling out the indexicality of the photographic image and embracing digital manipulations for the sake of captivating the audience (see previous section) entail a discussion of the nature of the subject matter discussed in documentary. Lee-Wright (2010), when reflecting on the production of wildlife documentaries, speaks of the possibility for these products to engage with the public through emotion. Chapter 1 dealt with this kind of audience engagement in

the experiencing of documentary (Eitzen, 2005), and Campbell carries this notion further towards that of the *sublime* (p.49). The sublime, the awe and wonder that arise from the beauty of the audiovisual spectacle (Wheatley, 2004), resonate more strongly in a genre in which sublime can be so well maximised by the inclusion of digital animation. This is precisely the problem that Alastair Fothergill voiced when *The Blue Planet* and *Planet Earth* first aired in 2006: “This is a rose-tinted view of our planet”. Indeed, in the turn to the spectacular and factual entertainment of documentary, another risk that the genre faces is that of not addressing the subject matter in all of its facets. Fothergill was especially graphic when stating that they could not “expect audiences to cosy up on the sofa at 9 o’clock on a Sunday evening to be talked to about the negative side of the state of the planet”. In the effort to approach science to audiences, not only does the use of CGI question the indexicality and evidentiary character of science documentary, but also the rose-tinted, sublime-directed treatment of the subject matter that is favoured in the TV schedule ecology contributes to the genre’s instability.

Campbell (2006) has defined such state of documentary as the ‘rotting carcass of science TV’, a state in which science-related shows have embraced entertainment and animation and may be losing the character implied by the word ‘documentary’. But, even located in the ‘postdocumentary’ context of ‘diversion’ (Corner, 2002), what could possibly not be denied is the still existing drive on the part of creators to promote scientific communication in documentary, and a desire on the part of the audiences to be informed and take action in the real world. The collective of citizens formed by creators and audience of science documentary still survives, and, as the following section will discuss, meshes into the superior interest of democratising science embodied in the Open Science movement.

2.2. SCIENCE DOCUMENTARIES, OPEN SCIENCE, AND NEW FORMS OF SCIENCE IN WEB 2.0

As section 1.4.2 in Chapter 1 showed, IDocs have profited from Open Source, one of the principles of the OS movement, in order to open the use of code data,

applications, and other digital tools to documentary filmmakers. Nonetheless, the body of literature concerning the connection of science documentary online with the OS movement is virtually non-existent. Some documentaries have indeed addressed the issue of OS (*Paywall*, 2018), but critique has not focused on the connection between the movement and how they promote scientific communication through the documentary genre. This section will establish the connection between the target genre and the OS movement, focusing on the definition of the latter concept and moving into its realisations in Web 2.0.

2.2.1 Defining ‘Open Science’ and its connection with the ISDoc

The Open Science (OS) movement has been a major phenomenon in the beginnings of the 21st century which involves, according to Nielsen (2012), “an acceleration in the speed of scientific discovery, and a profound change within science and society relationships” (p. 158). The implications of the existence of this movement, which replicates past happenings such as the 17th century academic revolution, are mostly impregnating every aspect which is nowadays intertwined in scientific processes: data management, publication of results, promotion and acknowledgements, new ways of socialisation, and so on. All of them, as stated by Delfanti and Pitrelli (2015), are preconditioned by the development of digital networking and advances in interactive digital media.

However, and in spite of different political institutions’ efforts in opening the path for these new ways of communicating scientific research, different agents involved in this transformation (which includes from non-expert audiences to stakeholders operating at different levels) may not be aware of the various implications of the movement itself (in the form of derived practices from OS such as Open Data or Open Access, or even the definition, as explained by Fecher and Friesike, 2014). Even the European Commission in charge of the analysis of the OS policies in the EU may classify this stance as a ‘lack of awareness among stakeholders’ (European Commission, 2015a, 2015b, 2015c). This was the point of departure for Vicente-Sáez and Martínez-Fuentes (2018) study, aiming at providing a ‘rigorous, integrated, and up-to-date definition of the Open Science phenomenon through a systematic literature review’. Accordingly, after reviewing a corpus composed of 75 academic

texts with a focus on different implications of the OS movement (namely ‘knowledge’, ‘transparent’, ‘accessible’, and others) and applying Grant and Booth’s (2009) SALSA (Search, Appraisal, Synthesis, and Analysis) framework, the proposed definition was the following: “Open Science is transparent and accessible knowledge that is shared and developed through collaborative networks” (p. 7).

As wide as the definition may seem at first, and as the authors explain, it is able to encompass the different aspects and realisations of the OS movement and effectively considering its implementation by stakeholders and non-expert audiences. And, most importantly for the aim of this thesis, it provides a unified definition from which the consideration of the ISDoc as an OS genre could depart.

Firstly, and as explained in Chapter 1, documentary encourages the transmission of contents upon which active reflection (rather than passive consumption) is established. This claim is in line with Vicente-Sáez and Martínez-Fuentes (2018, p. 7) definition, and, more concretely, with the first part of the sentence: ‘transparent and accessible knowledge’. In the ISDoc, the nature of the ‘transparent and accessible knowledge’ ranges across a wide variety of topics, including those in line with this thesis: science, ecology, conservation, and medicine. Gifreu-Castells (2013b) examined 100 IDocs from 2007 to 2012, and his quantitative analysis determined that among the ‘most used topics’, ‘ecology and environment’ classified with 24 results; and among the ‘widely used’, ‘science and medicine’ (6) and ‘natural disasters’ (6) were included. In line with this finding, it could then be assumed that not only the ISDoc could conform an OS genre, but also that it is compromised, in a significant manner, with the communication of scientific knowledge (as previewed in section 2.1 within this chapter).

Secondly, and even if most of the bibliography on OS has directed its attention towards practices of science communication in academia, OS should also be regarded as a movement that has opened the field for citizen ‘grassroots’ science movements to occur. These grassroots movements are defined by Martin (2005) as “science done by people outside the mainstream of professional science, which includes research by amateurs and lay people as well as some dissident work by

professional scientists”⁹ (p. 158) Grassroot science movements, in turn, feed the need for OS to continue its development in order to satisfy the increasing demand for the science democratisation, and this development is produced mostly through Web 2.0 and its communicative affordances.

This phenomenon is related to Vicente-Sáez and Martínez-Fuentes’ (2018) definition in the part which states that knowledge is ‘shared and developed through collaborative networks’. Accordingly, and in a context of Web 2.0 which, as explained in Chapter 1, welcomes and encourages a ‘participatory culture’ (Jenkins, 2006), audiovisual creations that have taken place in the Web and deal with scientific communication to non-expert audiences have experienced an increase in its diffusion; on the part of creation, *RiP!: A Remix Manifesto* (explained in Chapter 1) highlights the shifting landscape of production and creation practices in Web 2.0.

The ISDoc is no exception to these phenomena, since it is an emerging form within ‘the ecosystems of the digital media landscape’ (Dovey, 2014, p.11). Nonetheless, and bearing in mind the previous discussion, the boundaries of the documentary genre -and genre in general, as Askehave and Nielsen (2005) explain when defining it in the context of Web 2.0- make it necessary an examination of parallel audiovisual creations and how they contribute to the documentary’s genre hybridisation that I will address in the following section. In short, seeing the ISDoc as an OS genre entails the consideration of the ways in which science is being communicated to non-expert audiences online, and how the digital paradigm

⁹ Two considerations about the nature of these movements should be made. Firstly, ‘grassroots’ in this thesis adopts a different meaning from definitions that imply a political connotation (cf. Yenerall’s 2017 definition) or, simply, a ‘basic, fundamental’ or ‘ordinary’ value (cf. Merriam-Webster and Cambridge Dictionary’s definition, respectively); this thesis employs ‘grassroots’ in the context of online audiovisual creations (cf. use in Kinder, 2008, p. 55). Secondly, and as further sections of this thesis will explore, the concept of ‘grassroots’ is tied to that of PES (Public Engagement with Science). The nature of this model indicates the role of the ‘public’ (as related to the word ‘amateurs’ in Martin’s definition) as active subjects in science communication, but also entails a consideration of the ‘public’ as the audience that engages with the work of the ‘professional scientists’. Note that ‘dissident’, in this case, does not necessarily mean that said work from professional scientists is ‘disagreeing’ or ‘dissenting’ (cf. definitions in Merriam-Webster and Cambridge Dictionaries) from science (or science communication) models, but rather, that the channels of dissemination for science to be communicated are different from traditional, ‘academic’ publications, as explained in section 2.2 within this chapter.

makes the ISDoc a site of contention between these forms of science communication that contribute to its detachment from traditional documentary forms and its current genre ‘instability’ (Corner, 2002) and hybridisation.

2.2.2 Hybridisation in science online

New forms of science 2.0

The first section within this chapter has opened the discussion about the current state of the science documentary and how its generic conventions are disputed with the advent of the post-documentary era and the pushing forward of new technologies that have ‘remediated’ the very claims to truth and scientism that were the essence of the genre. Moreover, the previous section has provided an insight into what ‘communicating science’ means in the context of the OS movement, its grassroots realisations, and Web 2.0. Given these issues, it would be worth examining specific instances of science being communicated online, with the purpose of extracting different technical and multimodal features that characterise online science genres.

A first useful distinction can be established between academic and vernacular (adapting Burgess & Green 2009 concept) science genres. Although outside the scope of this thesis, online academic publications vary in the use they make of Internet affordances, a phenomenon which is similar to other internet genres, and leads to the question of whether their implementation in online platforms truly produces any significant affordance from the genre they come from. In fact, most of these academic genres are not emerging (or native) to Web 2.0, but rather constitute examples of ‘traditional’ genres that are *remediated* into Web 2.0 (using Elleström’s terminology, 2014). This has led researchers to claim that while the Internet implies a ‘new arena with less control and regulation than academic disciplines’ that Miller (2014, p. 61) suggests for internet genres, these same academic disciplines do not make any ‘substantial change’ to their early prototypes when their products are remediated into the Internet, thus leading to the claim that Internet affordances are but ‘lipstick’ (Pérez-Llantada, 2013, p. 222).

Apart from processes of remediation of traditional academic genres, research also points towards the adaptation of academia into “a wide array of semi-formal and informal channels (or genres) such as email, mailing lists, blogs, microblogs, and social networking sites (SNS) [which] are widely used by scientists to discuss their research” (Borgman, 2007; Nentwich and König, 2012). This latter group of channels does not involve the adaptation of traditional genres into the affordances of Web 2.0, but rather a reformulation of native Web 2.0 genres for the purposes of academic communication. This phenomenon has an impact in considering these products from a point of view of genre. For instance, Puschmann’s (2014) analysis of microblogs as examples of scholarly communication was not conclusive in offering a purpose for this genre: “the potential uses of microblogs for scholarly communication are highly varied, ranging from virtual journal clubs (Reich, 2011) and debates about current, science-related events, to self-help for graduate students” (p. 98). Neither was the definition of the relationships between the audiences and creators within this genre, considering that it may perform a double function of being a channel of communication between peer-scientists, but also facilitating interaction with the general public. In fact, Puschmann’s statement that “typical user’s timeline is likely to be populated both by scholarly content and personal remarks, more or less side by side” (p.98) may contravene the rigorous standards for objectivity that are presupposed to formal academic prose.

All of these processes of ‘erosion’ of the traditional sphere of scientific discourse (Trench, 2008) favours the flourishing of non-expert discourses of scientific communication labelled as *para-scientific genres* (Kaplan & Radin, 2011; Kelly & Miller, 2016). Kaplan & Radin argue that these genres “are distinctive in that they seek to communicate to an audience both within and outside the formal scientific community”; Kelly & Miller add that para-scientific genres function outside the traditional ‘gatekeeping practices’ that are common of academic discourse; Pérez-Llantada (2021) argues that these genres ultimately contribute to the democratisation of science (p. 62) and that Open Science “has the potential to lead to increased sensitisation and education of lay publics in issues of science that are of local and global concern” (p. 103). Determining the validity of the scientific

claims laid in these genres, among which the ISDoc could be placed, will be undertaken in Chapter 4 within this thesis.

Catering for all the variety of academic online genres and their purposes is indeed difficult, but, going back to Miller's quote, the arena of Internet genres seems to be to date even less regulated in the case of non-academic or vernacular genres. ISDocs are part of this group of non-academic genres that have developed within Web 2.0 in the context of a 'participatory culture' which aims at democratising knowledge. Thus, it is inherently related to the principles of OS in its 'grassroots' dimension, as noted previously. Moreover, the inherently multimodal architecture of Web 2.0 involves the use of audiovisual resources (which are the basis of documentary products) and have been appraised by researchers such as Pasquali (2007) given the advantages of using video "to communicate scientific methods, protocols and results" and to publicise "educational and outreach programmes" (p. 712).

Most of these audiovisual creations can be located in online platforms that operate under the principle of Open Access (Sitek & Bertelman: 'free access to scientific knowledge for everybody'). This conception of Open Access should not be established in terms of 'publicising research', but rather, in the way that video distribution platforms (such as YouTube, Vimeo, TedED) operate through the transmission of Open Source Content (see Cheliotis, 2009) and are intrinsic of Web 2.0 collaborative and participatory architecture. Online science videos have grown in popularity not only among academics and similar institutions (Kousha, Thelwall & Abdoli, 2012), but are being increasingly becoming individual user-generated content widely grouped under the concept of 'edutainment' (Auderheide, 2007; Santini, 2015). Santini explains that consumption of these videos, which, because of its nature, "cut across many research fields both in humanities and sciences" (p. 52), is considerably increasing (content-creator users have risen from 14% in 2009 to 31% in 2013). Kousha, Thelwall and Abdoli have even signalled the potential use of YouTube as a source of scientific data and are accordingly experiencing an increase in the number of academic citations (p. 12). In all, and as Erviti and Stengler (2016) also conclude, science popularisation through online distribution

platforms is experiencing a growth which detaches this genre from traditional ones by allowing user-generated content and community-building within the bounds of Internet's participatory culture.

Nonetheless, reducing grassroots science popularisation to audiovisual products may be lacking in that it would not consider genres from different fields¹⁰ that are part of the 'sharing accessible and transparent knowledge through collaborative networks' effort. Dunwoody (2014) explains that amidst the changes in science communication in the 20th century, scientific investigation and science popularisation were gradually separated, with the latter mostly carried out by journalists. From that point on, science journalism has adopted different facets, as explained in Secko, Amend, and Friday's (2013) four-part model and which differentiates between 'focus on information delivery' and 'focus on public engagement' (p. 67). Furthermore, Dunwoody argues that not only does online science journalism require the effort on the part of journalists to check their 'stories' and validate their claims (against all the information that circulates in the Web and users' possibility to contest them), but also requires the upgrading of journalists' skills based on the learning of 'multimedia' (multimodal / audiovisual) and also discursive or narrative codes that follow journalistic rather than a scientific style. Di Sia (2017) and Nentwich and König (2014) have also addressed the issue of these genres being gradually integrated within Social Networking Sites (SNS), which further blurs the boundaries between creators and users through maximised possibilities for communication and encouragement of user-generated content.

All of these trends, and more specifically, the vernacular, come into play in the configuration of science communication in the ISDoc genre. But the latter, it being an emergent genre in Web 2.0, has not still found a generic stability on its own with 'stabilised-enough' (following Schryer, 1993) features (in terms of science communication) that allow for a precise definition of what it means to communicate science in the genre. All the aforementioned influences and how

¹⁰ By different fields this thesis refers to those encompassed under the term of 'science journalism, which entails differences from academic writing on science mostly based on the creators

they influence the ISDoc genre both at a formal and discursive level take us to the concept of hybridisation.

Defining hybridisation

Hybridisation is a term that can explain the influences in science communication within ISDocs. According to genre theory, *hybridisation* is widely used (as an ‘umbrella’) for all kinds of “blending, mixing, and combining that occur in genres and texts” (Mäntynen and Shore 2014, p. 738). Most importantly for the purposes of cataloguing the ISDoc, hybridisation is a process which is more aptly applied to those products which ‘constitute new and *emerging* genres’ (p. 751). As argued earlier, analysing genre in Web 2.0 encompassed the consideration of processes of evolution and emergence (in Miller’s terminology) that shape genres. Indeed, ISDocs are products that, given the status of their ‘traditional’ (or non-web) ancestors, encompass a series of fixed discursive and multimodal features that makes them *evolving*. Nonetheless, the different hybridisation processes that can be extracted from ISDocs makes them closer to an *emergent*, web-native genre. Mäntynen and Shore’s discussion structures different processes that entail the adaptation of materials from genres in different degrees, namely sequential intertextuality, embedding, appropriation, and genre blending, which seem to be enhanced in the Internet.

In general, Manovich (2007) explains that the algorithmic nature of software that characterises ISDocs (and Web 2.0) encourages the “remixing of not only content from different media but also their fundamental techniques, working methods, and ways of representation and expression” (p. 7). Additionally, as Whalen (2008) argues, Web 2.0’s favouring of different modes and media makes genre analysis not only subject to more specific analysis based on multimodal hybridisations, but also implies that, from a perspective of designers, free-form designs entailed processes of negotiation and re-negotiation with audiences that produce intrinsic hybridisation through different points of view (p. 77). This tendency to hybridisation of online products is precisely what enables different forms of science communication to coexist within the ISDoc.

Indeed, hybridisation is enhanced within Web 2.0, but it is not an alien concept to traditional forms of science documentary. Van Dijck (2006) had already applied the concept of hybridisation to how scientists had been ‘persuaded by the increased dramatic appeal of science programming’ (p. 10) and had expanded the range of functions of science documentary by creating hybrids such as the docu-drama. Hybridisations of ISDocs mostly depend on the matrix genre or area from which the contents are extracted. For instance, Vázquez-Herrero and López-García (2019, p. 40) state that cyberjournalism (and processes of journalistic innovation) ‘are connected to the renovation of multimedia narrative formats’ such as the IDoc, and are further tied to process of technological convergence and the impact of ‘transmedia storytelling’ on the documentary format (Vázquez-Herrero & López-García, 2016, p. 414). ISDocs include instances of cyberjournalism hybridised farther than in terms of discourse: for example, in how storytelling is articulated, or how there is an emphasis in structuring the content into ‘breaking news’ material (Zhang, 2018, p. 3), which leads to the use of headlines, both of which can be found in ISDoc *Bear 71* (Mendes & Allison, 2012). Additionally, the influence of cyberjournalism on ISDoc can be seen in the way that some documentaries adopt the same interfaces as news pages (for instance, *InfoAmazonia*, whose interface resembles that of an online newspaper) or embed news articles within their systems (for instance, in *Netwars: Out of CTRL*). The influence of online science video is noticeable in the way that ISDocs have hybridised their formats in terms of length or delivery of information (which according to Erviti & Stengler, has shifted towards a more ‘personal’ and ‘conversational’ style) or how ISDocs hybridise the audiovisual grammar (in terms of shots, takes, montage...), as Morcillo, Czurda, and Trotha (2015) explain. Moreover, the hybrid features from SNS of ISDocs are evident not only in the possibility of sharing the documentary through social networks by simply pushing a button, but also in how some ISDocs are directly integrated in the architecture of certain SNS (for instance, *Ebola Outbreak: A Virtual Journey* is integrated within the platform Facebook Watch). Furthermore, the influence is not only restricted to the aforementioned domains, but the genre also finds influences from other areas such as interactive mapping

and cartography (see *Bear 71* and *InfoAmazonia*), diary / journey videoblogs (*This Land*) or photo slideshows (*The Zone*), among others.

Nonetheless, the possibility for the ISDoc genre to be hybridised with these domains entails several considerations that problematise its analysis from a point of view of genre. For instance, as Weidle (2018) explains, the hybridisations the ISDoc is subject to are also associated with an 'aesthetic' dimension, which in turn serves to afford the negotiations between truth, reality, and users' experiencing of documentary, but may distance the genre from a functional-oriented view of science. Moreover, Zhang's (2018) criticism aims at exploring how science rhetoric is hybridised with promotional discourse. This latter discourse resembles marketisation techniques and is evolving online science news (and possibly other science genres such as the ISDoc) towards a type of 'scifotainment' (p. 20) which also leaves the factual, informing purpose of the genre for an 'engagement and retailing' goal. Finally, it is worth noting the documentary label is becoming to be disputed in the context of major distribution platforms and their influence on the genre. This is seen in Davis and León (2018) analysis of science documentaries in the digital context: for the authors, science documentaries' storytelling is adapting to these technological changes in a way that makes them become simple online science videos due to the constraints on length and narratives that are particular to Web 2.0.

So far, this section has aimed at analysing the different implications for the communication of science, and how the ISDoc is indeed a genre that serves to popularise scientific knowledge. It was argued that the assignment of the genre as an OS, grassroots genre, which has emerged in Web 2.0 and is increasingly becoming hybridised with different online genres, gives rise to alterations of the ISDoc in terms of structure, narrative, audiovisual and multimodal grammar, and how is science communicated. While this section has explained why the ISDoc is indeed a scientific genre, the next section will discuss the nature of that communication and its implications in the digital paradigm.

CHAPTER 3. THE MATERIAL CONDITIONS FOR ISDOCS

The primary goal of this chapter is to understand *how the digital medium has shaped the way in which users access documentary contents*. Several questions arose regarding this issue:

1. How different are the stances through which users access and view a ‘traditional’ documentary and an ISDoc?
2. From the point of view of multimodality, how do these stances and the audiovisual materials evolve within the digital paradigm?
3. What is ‘interactivity’, and how does it determine the narrative structure of the ISDoc genre?

The point of departure involves the changes in the stances (reading and navigation, according to Finneman, 1999) and how they are critical to understand its impact on ISDocs’ scientific narrative. As a result, an overview on the functionalities of hypertext and how they enable these changes in discourse is provided as an introduction to the chapter.

Secondly, I was concerned about how the different audiovisual resources that were present in traditional forms of documentary could be analysed from the point of view of multimodality. For this purpose, I consider Bateman’s (2017) theory of the semiotic modes as the method that could explain how the modes that compose said resources underwent change in Web 2.0. Section 3.1.2 explains how these changes correspond to the phenomenon of transmediality.

Lastly, I considered that the relation between user and system in the context of an OS genre within Web 2.0 could entail changes in the macro-structure of the genre. Accordingly, understanding the key concept that accompanies this transmediated form of documentary (‘interactive’) from a technical perspective was the final goal of the chapter. For the genre under study, interactivity brings about the integration of novel storytelling and narrative possibilities, as studied under the optic of IDN theory (Interactive Digital Narratives; Koenitz, 2010). Ultimately, how these IDNs are traversed and made sense of by users is explained with the concept of *hypersemiosis* (section 3.3.3).

3.1. ISDOCS AND DIGITAL MULTIMODAL AFFORDANCES

3.1.1 The enabling material conditions for multimodality: hypertext.

The previous chapters within this thesis have tried to foreground the relevance of changes in Web 2.0 as nuclear for explaining alterations in the structure of genres. Accordingly, the point of departure is to understand the main procedure that enables users' increased interaction with interfaces in Web 2.0. This digital affordance is known as *hypertext*. Although this thesis will not discuss the specific origins and implementation of hypertextual systems as formulated by Nelson and Engelbart, hypertext as a digital phenomenon has been subject to interpretations that align this occurrence with the study of genre.

Snyder's (1996) notion of hypertext concerns an arrangement of 'blocks of text' and the 'electronic links which offer different pathways to users'. As explained in further detail within this chapter, the two elements that correspond to this hypertext structure will be correlated to lexias and other interactive devices. For the moment, it serves as a representation of the kind of technical materiality that hypertexts work with. Finneman's (1999) consideration of hypertexts is concerned with the structuration of said elements and how its appearance comes to represent the so-called 'digitisation of a medium' (p. 18), that is, the *adaptation* of analogical components into interconnected strings of bits that accomplish different functions when interacted upon at interface level. Nonetheless, Finneman explains that such definition would account for mostly all the processes that conform computerisation, and thus refers to hypertext "as a notion of a limited class of applications, as a genre with a set of related subgenres" (p. 20). In that sense, Finneman's consideration about hypertext resonates strongly within the scope of genre theory since the focus is displaced from the electronic or digital component to the structuration (or form / formal features, following Miller & Shepherd's 2004 terminology) of texts that make use of this digital affordance.

Finneman's main contribution to the understanding of hypertext comes through the suggestion of a change in the reader stance when facing hypertextual genres. This involves the change from a *reading mode* towards a *browsing/navigating mode*

(p. 27). The metaphor of the navigating mode is useful in considering how, during the process of interpretation of a hypertext, the traditional role as 'reader' (which involves a 'traditional' or 'analogic' consumption of the text) shifts onto that of 'user', a capacity that acts as a precursor of the social enactment for the audiences' need for increased participation within Web 2.0 genres. More interestingly, the distinction between the *browsing* and the *navigation* stances suggests that the decoding of the text is a goal-oriented process that is dependent on either users' expectations or pre-specified criteria by the text's creators, something that questions the role of authorship and the creation of meaning in these genres. Askehave and Nielsen (2005) expand the implications of hypertext on genre theory and open the field for discussion about how users interpret these texts. This 'goal-orientedness', for Askehave and Nielsen, is a process which aligns with Swales' (1990) notion of genre as defined by its communicative purpose and enacted over a series of rhetorical strategies. Ultimately, these stances enact the inherent exigence of Web 2.0 (and further): that of providing users with wider possibilities of interaction in order to achieve their communicative goals.

In order to account for the generic properties of Web genres, the two *modal shifts* that take part in this process of interpretation can be examined focusing on three levels for each of the shifts. Accordingly, "in the reading mode, the *text* must be characterised in terms of its communicative purpose, moves, and rhetorical strategies", and "in the navigating mode, the *medium* must be characterised in terms of its communicative purpose, links, and rhetorical strategies" (Askehave & Nielsen, 2005, p. 4). Nonetheless, the rhetorical implications, as Caballero (2008) argues, are not the only ones that underlie hypertextual or 'cybergenre' analysis. Apart from the rhetorical, Caballero (p. 23) adds the *topical* and the *discursive* implications. The former concern how the hypertext expands the topical reach of a text by establishing interconnections between the "key words with other texts dealing with similar subjects", whereas the latter "open[s] discourse spaces where writers and readers can interact faster and more actively than in traditional print practices", implying a potential for the creation of digital rhetorical communities which is also suggested by Swales (1993) and Miller (1994).

At this point, it is worth questioning how hypertext relates to filmic practices such as those that underlie documentary creation. In this line, Herring, Tannen and Trester (2013) signal hypertext as an emergent feature of Web 2.0 discourse which is capable of altering the rhetorical organisation of digital genres (p. 14). Furthermore, this occurrence points towards the most significant relation of hypertext with the ISDoc genre, which comprises the consideration of *linearity* and *sequentiality*. Vázquez-Herrero and López García (2019), among other authors, explain that ‘the hypertext makes it possible for the experience to be non-linear and individual, through the division of contents (in chapters or smaller units) and non-sequential access’ (p. 12). In fact, earlier accounts about this issue can be found in Nielsen’s (1990) comparison of hypertext to traditional media:

The simplest way to define hypertext is to contrast it with traditional text like this book. All traditional text, whether in printed form or in computer files, is sequential, meaning that there is a single linear sequence defining the order in which the text is to be read...Hypertext is nonsequential, there is no single order that determines the sequence in which the text is to be read. (p. 1)

This thesis agrees with the consideration of hypertext as a non-linear structuration of the genre: given the physicality (or materiality, as Bateman, 2017 argues) of the medium, the hypertext configures digital genres beyond time and space constraints, redistributing information across the aforementioned ‘informational blocks’ in a ‘virtual’ manner (using Miller’s adjective for the description of rhetorical communities, and earlier discussion within Chapter 1, Section 1.3.2 in this thesis). Nonetheless, this thesis does not consider that hypertext is ‘nonsequential’. For instance, Braid (2013) considers that linearity can be understood as a convention: “if we talk about non-linearity we suppose that the filmic text or simply the “media text” we are exploiting is clearly non-linear, not even on the appearance it could follow a linear path” (p. 66). Finneman’s interpretation of sequentiality for hypertext involves the consideration of other discursive mechanisms in traditional texts (such as deixis) or genres (especially compositional genres such as newspapers or book or poem collections) which

would draw them closer to non-sequential genres (pp. 22-23). Finneman considers that:

[...] In an ordinary text you are supposed to move from chapter 1, to chapter 2, while in a hypertext you are supposed to choose your own serial order at various stages on the journey. But even so, you still have to choose, you have to determine the order in which you will read the texts and this order will always be sequential. (p. 25).

For the purpose of analysing the target genre for this thesis, it is then fundamental to understand how filmic studies tackle the issue of sequentiality in hypertextual narrative genres. Miles's (2014) contribution to this discussion equates the hypertextual libraries, that is, a database, to a similar 'trim bin' of cinematic shots taken during filming. As this author claims, "these fragments are small, understandable, parts that can be assembled into larger forms, generally considered to be the work proper" (p. 69). This concept of 'fragmentation' of the aforementioned hypertextual 'informational' blocks is understood by Miles as *granularity*, which also implies "the way in which the constituent parts of a film and a database are autonomous wholes" (p. 74). More importantly, the collection of fragments (either shots or informational blocks) follows a sequence that is no longer decided by the editor (p. 71), but, as Branigan (1992) explains, is ascribed by the audiences by means of "intentional relations between shots or sequences to ensure syntactical continuity" (p. 37). For Miles, in fact, the hypertextual nature of genres such as the ISDocs is not only non-linear or non-sequential, but should rather be considered as 'multilinear'; as such, the problem moves towards what implies to create a 'multi-faceted', 'crystalline' structure (p. 75) which is also capable of communicating scientific contents.

Finally, tying Miles's contribution back to the hypertext's possibilities based on its functionalities, Canan (2007) explains that, in hypertextual structures, the 'receiver' (as a user) understands "information from several angles, mainly with the new interactive perspectives" (p. 143). More interestingly, Canan states that "nonlinear narrative can allow us to open up new 'windows' of knowledge and, perhaps, provide a more complex and less discriminating viewpoint about the

reality that surrounds us” (p. 143); an occurrence which, in line with the Documentary Contract’s claims, points towards an accomplishment of the ‘Truth’ clause and enacts documentary’s exigence of ‘taking action’ through its digital representation (that is, furthering users’ knowledge by ‘taking action’ upon the digital medium through which ISDoc is communicated).

As hypertext has developed, the integration of elements other than purely textual has appeared as a salient feature of Internet genres. From a point of view of genre analysis, the integration of different semiotic modes implies the need for a framework of analysis which accounts for the audiovisual materials that come to play part in digital creations, a phenomenon studied by multimodality. But in the context of ISDocs, the ‘hypertextualisation’ of these pre-existing audiovisual modes indicates a further transformation of the documentary form within the digital context.

3.1.2 From mode affordances to the transmediation of the ISDoc genre

As argued in the previous section, the relation genre-hypertext implies that the affordances provided by the latter arise as objects of study for the former. As discussed, hypertextual structures expand the possibilities for the inclusion of resources in a *virtual* manner; in other words, they allow for the spread of contents that can be optionally accessed by users in a seemingly endless assembly. But rather than considering the *structure* of hypertextuality, which was highlighted in the previous section, it is now necessary to examine the kind of *materials* that appear within these recursive hypertextual structures. By ‘materials’ I am referring to any meaning-making cue that is in this case susceptible to being afforded by the digital medium. This claim now seems obvious, given the degree of optimisation that hardware and software has reached, and which ultimately allows for the incorporation of different technologies and actants into digital genres. But not all the different media allow for this expansion to occur. Consider the target genre of this work and discussion in Chapter 1: how is the ISDoc different, in terms of its supporting *media* and the creation of meaning, from its earlier predecessor, the SD? In order to answer this question, the point of departure must be the consideration of how meaning is created within these platforms at a core level, that

is, considering the affordances that *medium* provides for the harnessing of different *modes*.

Modes are defined as “regularized organised set of resources for meaning-making, including, image, gesture, movement, music speech and sound-effect. Modes are broadly understood to be the effect of the work of culture in shaping material into resources for representation” (Jewitt and Kress, 2003, p. 2). As the digital environment inherently supports and harnesses a myriad of possibilities for the creation of signification (consider the variety of materials that are present in a single webpage), these new meaning-making cues ultimately expand the range of contents that can be found in genres online. The potential realisations of meaning through these modes are the so-called ‘mode affordances’ (Kress, 2010). The affordances of a mode are shaped by its materiality (that is, the kind of stimuli that is triggered at a perceptual level), on the one hand, and by how culture and society shape the use of these modes in context, something which is susceptible to change in a spatiotemporal trajectory (Lemke, 2000). Proposals such as Lemke’s highlight the connection that is established between perception and culture, something which, in the context of Genre studies, is useful for the explanation of how culture transforms the materialities of modal ensembles into artifacts by conventionalising their social exigences.

This is operationalised through the discursive capabilities of the modes: the phenomenon of *multimodality*¹¹, as Norris (2013) explains, has become topicalised in connection with the development of digital media technologies, and is typically seen as a defining feature of Web 2.0 discourse. Herring and Tannen (2013) agree in stating that multimodality has a noticeable impact on a discursive level. According to the authors, early frameworks such as the Computer-Mediated Discourse Analysis (CMDA) could be used as a methodology for the analysis in order to ‘mine networked communication for patterns of structure and meaning, broadly construed’ in these multimodal ensembles (Herring, 2004). Frameworks such as this are based on the notion that the evolution of the media affordances in

¹¹ ‘A way of characterising communicative situations which rely upon combinations of different ‘forms’ of communication to be effective’ (Bateman, Wildfeuer, Hiippala, 2017, p. 7).

Web 2.0 has opened the way for the ‘juxtaposition with other content’ (p. 4) in converged media platforms. This ‘convergence’ within different media platforms is similar to the phenomenon of *hybridisation* (which was explained in Section 2.2.2 within Chapter 2). Therefore, for Herring and Tannen, the phenomenon of convergence evidences the need for a revision of early models of analysis¹². It is this ‘Discourse 2.0’ (p. 5) that raises issues about the nature of interactions in digital media, usage patterns, users’ adaptations, and, for the purpose of this section, new types of content. Accordingly, in order to analyse these new contents, new analytical models (such as the four-levelled CMDA framework) must cater for a new dimension: that of multimodal communication (p. 20), which analyses phenomena of mode choice, spatial and temporal positionality and deixis, and animation, among others. Finally, Herring and Tannen further that, in order to adapt to these occurrences, the analysis of multimodal communication should be complemented by methodologies extracted from other specific disciplines such as social semiotics, visual content analysis, or film studies (p. 20), (the latter being obviously connected to the target genre in this thesis, which will be more relevant in further sections).

As already hinted, modes and its affordances, especially in digital genres, appear in ensembles of combinations (Jones & Hafner, 2012), as permitted by the Web’s hypertextual structure. This step into the digital has led authors such as Lemke (2002) to claim that rather than multimodality, digital artifacts exhibit *hypermodality*: the blend of multimodality and hypertextuality which highlights the effect that the latter has on the former by maximising the interaction that users can establish with the modes. In terms of the impact on the structuration of contents and users’ browsing and navigation stances, hypermodality also ‘subverts monologism across the multiplication of modal affordances alongside the linking to various texts, styles and registers’ (Francesconi, 2016, p. 8), thus favouring genre hybridisation and *interdiscursivity* (Bhatia, 2016), that is, the intertwining of discourses and genres within single artifacts. Ultimately, the concept of

¹² Which crystallises in the CMCMD (convergent media computer-mediated discourse), a model which highlights the process of creation of multimodal ensembles beyond a pure textual level.

hypermodality highlights the potential enhancement in user retention of contents, especially by allowing the embedding of microgenres and other *media products* (see next section). The connection between these genres, as Engberg and Maier (2015, 2019) demonstrate, is useful for the purposes of science dissemination in academic (2019; also Mirović et al., 2019) and non-academic genres, something that can also be extrapolated to the case of parascientific genres such as the ISDoc.

Altogether, modes have been defined as *materialities* that develop over time, own different affordances which vary depending on the sociocultural context of production, structure discourse (especially in digital genres) and are enhanced when included in hypertextual, user-directed structures. But the concept of ‘mode’, as Bateman (2017, p. 8) argues, is still insufficient if multimodal analysis does not consider the relation between the ‘configuration of semiotic resources’ and the ‘materialities that these resources engage’ at a core level¹³. By core level I am referring to the strictly perceptual level that is enabled by the affordances of the medium, something which will be discussed in the next section. Finally, this discussion will be useful in order to understand the evolution of the SD into Web 2.0 and how the digital medium shapes the kind of contents that appear in ISDocs, a phenomenon that will be analysed within the concept of *transmediation*.

The transmediation of the ISDoc genre

Before exploring the notion of *transmediation* in the linguistic terms that the previous section introduced, it is necessary to provide an overview of how the concept has been used in other areas of expertise. The dispute in its usage goes as far as to consider different types of “new” documentaries based on its media affordances.

Scolari (2012) claims that it is hypertextuality what defines the ‘interactive documentary’, and that the next step in the evolution is the ‘transmedia

¹³ As Bateman states, ‘broad mode labels of this kind [referring to Jewitt and Kress definition] do not provide sufficient leverage for characterizing what occurs when artefacts or performances draw on and combine combinations of these signifying practices. Again: moving ‘inside’ the categories in order to see what changes and what stays the same when we employ distinct forms of expressions together is necessary’ (p. 8).

documentary'. When examining what Scolari refers to with the latter concept in his analysis of two transmedia documentaries, the "transmedia expansion of the documentary" seems to refer to the embedding of "photographic albums [...] a web quiz and a series of complementary videos" towards its "release as a videogame and mobile-supported platform" (para. 3). In this sense, I would argue that, while Scolari is right in pointing out the embedding of genres as an innovative step in the evolution of IDocs, I do not agree that it eventually produces a detachment between 'interactive' and 'transmedia' documentary. For the ISDoc genre, while these embedded micro-genres may indeed perform different social actions within the texts, I believe they act in accordance with the overall social action of the genre. For instance, the inclusion of cartographic charts or press releases does not produce the transmediation of the genre per se; rather, transmediation implies that the media affordances allow the ISDoc (1) to include different modes which in turn expands the possibility for inclusion of other genres and (2) to be cross-platform, that is, to be displayed on different systems or devices. Perhaps this second possibility is what led Scolari and other authors within the field of journalism (Le Masurier, 2015; Rampazzo Gambarato, 2016, among others) to claim that it is the possibility of adapting IDocs to other platforms, what is constitutive of the process of transmediation. This view seems to stem, in the area of documentary studies, from Jenkins's (2003, p. 20-21) foundational description of transmedia as a "kind of media convergence where content flows across platforms", this multiplatform approach emerging out of the entertainment industry. In this line, O'Flynn (2012) establishes a difference between web documentary, transmedia documentary, and interactive documentary; while Pratten (2011) divides transmedia into 'franchise' ("different stories of the same storyworld spreading across media") and 'portmanteau' ("one single story across different media platforms").

As Chapter 1 introduced, the discussion about what transmediation implies adds more to the already complicated definition of documentary and, consequently, of ISDocs. The consensus in the documentary community is that transmediation implies the "flow of content across platforms", as Jenkins explains (2003, pp. 20-21). While this thesis is partly in accordance with the possibility of content in

ISDocs to be distributed in different platforms (thus exploiting media affordances), it envisions how users *flow* across *media* in a different way. As stated by Gaudenzi (2013, p. 177):

In a cross-platform narrative a same story can be present on different formats while in a trans-media story each platform only contains parts of the story, and the user/participant *needs to move from one media to the other to have the full picture*" [own emphasis].

In fact, this author even goes on to claim that "[transmedia documentaries] do not constitute a new mode of interaction but rather a marketing strategy" (p. 177). In Gaudenzi's sense, what 'transmediation' seems to be referring to is a production manner for documentary, one which envisions these new documentaries as making use of media affordances to expand their contents across different platforms, but which ultimately does not alter the way in which users interact with the genre. It is users who must actively engage with these media in order to *use* (and *enact*) the genre. However, further several questions arise from this stance: what does 'move from one media to the other' mean? How is the process carried out, and how do users get 'the full picture' in the flow across platforms? And, most importantly, what defines and separates one medium from another?¹⁴

I believe the aforementioned views on transmediation may subordinate the ISDocs contents and communicative purpose, and thus its social action, to the technical capabilities of media. While analytical approaches to genre recognise the role that media have in the constitution of genres (and more those in digital platforms, as

¹⁴ Jeff Rice (2006) argues that this emphasis of digital multimodal production requires a redefinition of English around the idea of connectivity through digital social networks (or cross-media platforms): "I enter into an economic and emotional connection with new media production. What I call 'network' means these spaces - literal or figurative- of connectivity. They are ideological as well as technological spaces generated by various forms of new media that allow information, people, places, and other items to establish a variety of relationships that previous space or ideologies of space (print being the dominant model) did not allow" (p. 128). The ability to create these connections through what Jenkins (2006) describes as "transmedia navigation" (p. 10) requires adolescents to know how to design multimodal texts in ways that best exploit the affordances of different media tools. The use of 'transmedia navigation', I believe, recognises the fact that new media 'push' for the development of new digital literacies, but it fails to address how these 'multimodal texts' and the media affordances represent a shift in the way that users end up configuring and socially enacting these relations.

the following sections will argue), the concept should still be examined under other approaches that do consider how structure (form) and content (semantics) (in Miller's terms) are dynamically influenced by the other in the configuration of genres. Approaches such as *transmedial narratology* (Herman, 2004; Ryan, 2005) posit that "the constraints and affordances associated with a given medium affect the narrative and the construction of the receiver's mental image", thus recognising how users construct genre's contents (and 'get the full picture') influenced by the capabilities of the medium. Sections 3.2.2 and 3.3.1 will further develop how narratological frameworks can contribute to the making sense of digital genres such as the ISDoc, and are similar to genre studies analysis in that they both consider how the technical (digital) components of the medium construe users' experience and their interpretation of the genre's contents.

Going back to the previous discussion, the phenomenon of multimodality concerns 'the use of different semiotic modes' (Barreto Lé, 2017, p. 143). Nonetheless, it does not fully tackle the materialities that involve and are involved by these modes and the role of medium, thus opening the possibility of formulating the same questions that Gaudenzi asks. Hence, there is a need to conform to a structured framework for the analysis of media transformations, thus siding with Yates et al. (1999, p. 84) claim that "medium can be used to identify genres". The research carried by of Elleström (2010, 2014, 2017, 2019a, 2019b) seems to address this gap through his constellation of concepts implying a variety of *media transfers* and characterising medium "in terms of its communicative purpose, links, and rhetorical strategies" (Askehave and Nielsen, 2005, p. 4).

Elleström (2019b) uses the term *mediate* "to describe the process of a technical medium of distribution that realizes presemiotic (potentially meaningful) sensory configurations" (p. 4). The possibility of mediation is enabled by *transmediality* (2019a), understood as the capacity of "different media types [that] share many basic traits that can be described in terms of material properties and abilities for activating mental capacities"¹⁵ (p. 5). Finally, the content, or the 'what' is

¹⁵ He follows: "All media products, in partly similar ways, are physical existences that trigger semiotic activity and can be properly understood only in relation to each other" (p. 5).

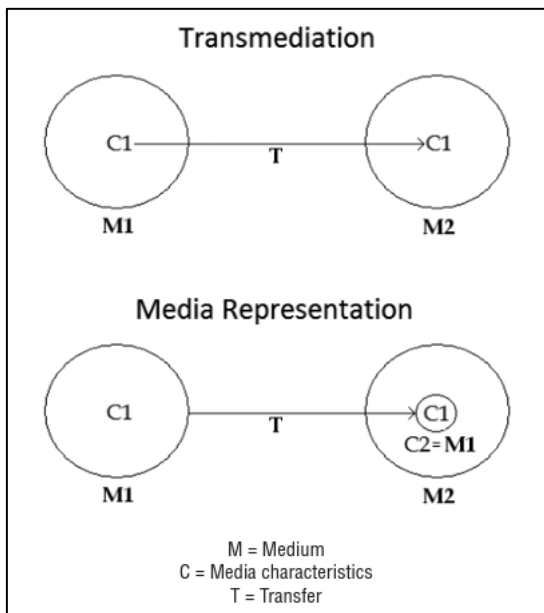
distributed, is what Elleström (2014) calls *media characteristics*, more precisely defined as “features of media products that are apprehended and formed when a structuring and interpreting mind makes sense of the mediated sensory configurations” (p. 40). In other words, the *technical medium/media* are the material support for *media products* (that can be identified as meta-genres such as novels, for instance), which have the possibility of conveying specific social actions (in Miller’s terminology) which conform the communicative purpose of the genre¹⁶. This idea will be further developed in section 3.3.1 within this chapter, insofar as it provides the theoretical support necessary to understand how the perception of genre (in the case of this thesis, interactive digital narratives) entails a dynamic process of users discovering of the technical media affordances and the media’s ‘openness’ in the degree of interaction allowed to users, thus modifying the digital platform.

At this point, in the process of mediation, Elleström distinguishes two potential manners in which the transfer of media characteristics can take place: *transmediation* and *media representation*. As Elleström states, while in transmediation the target medium *transmediates* (*represents again*) the source medium¹⁷, in media representation the target medium *represents* the source medium (see Figure 3.1). An example of transmediation is a written poem which is recited, while an example of media representation is “a news article describing a documentary” (p. 8). Elleström concludes by stating that there is not a clear divide between both processes (“There is no contradiction between a target medium representing, on the one hand, a source medium, and, on the other hand, mediating sensory configurations equivalent to those of the source medium”, p. 672¹⁸).

¹⁶ Konzack (2017) also emphasises the role of materiality and the evolution across technical media and media products: “transmediality as an examination of the materiality of media productions and the effects upon the content of shifting modalities within different media representations”.

¹⁷ Bateman (2017, p. 6) further expands this model to account for the complete process of technical medium supporting media products which carry media characteristics; Elleström reduces it to ‘medium’.

¹⁸ This in turn implies that the ‘pure’ transmediation of media characteristics (C1) leaves out the transmediation of media products.

Figure 3.1*Scheme for ‘transmediation’ and ‘media representation’*

Note. From “Transfer of media characteristics among dissimilar media”, by L. Elleström, 2017, *Palabra Clave*, 20(3), 663-685. [CC BY 4.0](#).

The existence of both processes raises questions about how the process of mediation between the matrix SD and the ISDoc occurs, and which materials are transferred. On the part of transmediation, it seems that the ISDoc and its social action (the ‘Documentary Contract’) is a media characteristic that derives from media products (from the areas of journalism, documentary, and science in general) afforded by the technical qualities of the digital medium. In that sense, ISDocs can be said to transmediate the SD because what their media characteristics represent, the Documentary Contract, is the same; the only difference being that the digital medium enables the same materialities and modes from the SD to take place in the ISDoc and even expand their possibilities. In this sense, the fact that the technical media which support the ISDoc also allow for those semiotic modes that characterise the SD, namely the audiovisual, makes the fundamental mediation of the media product seamless.

Nevertheless, addressing media representation is more difficult if considering the inherent hybridity of digital genres as is the case of the ISDoc. As Chapter 2 introduced, the different trends in science communication online have led to a blurring of the boundaries of scientific and parascientific communication, which

in turn augments the possibilities for the inclusion of materials from different sources and genres. In this way, genres such as the ISDoc are influenced by SNS or other areas such as interactive mapping or cartography, among others. Catering for all these needs, now afforded by the digital technical medium, and even representing these embedded genres acknowledging their source medium, is a common phenomenon in ISDocs.

The Last Generation (Worth & Mizner, 2018), for instance, includes the representation of photographic recollections of the native population in a way that resembles the Instant Film photography's typical white border, or the inclusion of newsreels embedded in simulated old television devices. Some other media characteristics, of course, are fully transmediated within the ISDocs interface, but the potential inclusion of many different modes that can be either transmediated or represented might constitute a problem for a direct application of Elleström's framework to these hybrid online genres. Ultimately, the difficulty in cataloguing the plethora of embedded genres depending on whether they are transmediated or represented implies a problematic relation of the ISDoc with the discursive, rhetorical, and social actions that these micro-genres enact. As Part 2 within this thesis will develop, these actions and genres will be characterised in terms of their structural facet (as parts of the ISDocs narrative structure and the genre's rhetorical structure), and not only through their purely material, multimodal, and multimedia features.

As seen in this section, the statement that "the digital medium enables materialities and modes" was intentionally left open so as to reflect on which nuclear elements constituted the transmediation from SD to ISDoc. Some semiotic modes, as argued, are susceptible to undergoing transmediation. Nonetheless, others are purely web-native, and thus expand the possibilities for the inclusion and embedding of other genres within the ISDoc. With expansion, I refer to Chapter 2 discussion on Van Dijck's narrative modes and visual styles for SD. The emergence of these web-native semiotic modes could be explained because of the creators' intent of adapting the genre to the specificities of the digital medium (which, as described in section 2.2.2 in Chapter 2, would simply be 'lipstick'). But

these changes, as described, have altered the macro-structure of the genre as a consequence of adhering to the Documentary Contract 2.0, thus conferring it the status of ‘emergent’¹⁹. From the point of view of genre theory (following Miller & Shepherd’s 2009 framework), it could be said that the semantic contents of the ISDoc follow a distinctive structuration in terms of the accessibility of its formal features. How these formal features allow for (1) the expansion of the technical medium’s affordances and thus (2) the achievement of the Documentary Contract 2.0 by enhancing the audiences’ technical possibilities to engage with the genre’s contents is explained by the phenomenon of *interactivity*.

3.2. ISDOCS AND INTERACTIVITY

The inconsistency in the use of the term ‘interactivity’ is mostly due to its use in a wide variety of fields. Domagk et al. (2010) narrow the scope into three main bodies of literature: “(1) interaction in human communication, stemming from a sociological tradition²⁰, (2) computer-mediated human communication, originating from mass communication approaches, and (3) human–computer interaction, derived from computer science but also applied in the field of educational technology” (p. 2). In the context of this thesis, the scope is set on the human-computer interaction (HCI) approach, by which examining genre implies attending to how digital genres such as the ISDoc, in line with their social action, presuppose interaction with the multimedia ensemble in order to construe the text.

This is the departing point to consider how interactivity constitutes the element that makes the ISDoc an *emergent* genre, in Miller’s terminology. In other words, and paralleling Miller’s (2016) argument about blogging, the *exigence* for active edification of knowledge and taking action embedded within the *kairos* of increased user participation enabled by the digital medium resulted in the

¹⁹ Mäntynen and Shore (2014) consider hybridisation to be a common future of “new and emergent genres”.

²⁰ Jensen (1998) suggests that interactivity is “the relationship between two or more people who, in a given situation, mutually adapt their behavior and actions to each other” (p. 188).

emergence of the ISDoc. In the same way as blogging could have emerged from prior practices such as the diary or the server log, the ISDoc had the SD as a potential ‘predecessor’. Nonetheless, Miller claims that for these emergent genres “something connected to them [prior genres] rhetorically, yet recognizably unlike them in distinctive ways, something functional and adapted to the complex environment yet unpredictable” (p. 10). Bringing to the fore Østergaard and Bundgaard (2015) discussion on genre emergence, “it is imprecise to content oneself to saying that a genre develops because of a need; here, it is rather the technological evolution that makes it possible to articulate a need and, thereby, the development of the genre” (p. 123). Thus, it is the technological allowance of interactivity, in its sense of human-computer interaction, in such a scale that it can potentially modify the contents of the digital text that founds the co-emergence of certain scientific and para-scientific genres such as the ISDoc.

3.2.1 From *interaction* to (ISDoc) *interactivity*

The concept of HCI contains the word ‘interaction’, which makes it necessary to distinguish it from ‘interactivity’. Pettengill (2017, p. 17) summarises the difference as follows: while *interaction* is defined “as the actions and reactions between a user and a system”, *interactivity* “indicates a level of equal reciprocation between interactions, as well as a level of *agency* that allows a sense of *authorship* within an experience” (Svanaes, 2000, p. 5; own emphasis). While HCI addresses the necessary interaction required for digital genres to be enacted, the concept of interactivity further requires that users’ actions and participation have “some sort of effect on the experience” (Mateas & Stern, 2006, p. 17). In line with OS genres, the concept of agency and authorship will be fundamental in understanding how users’ experience is required to construe the text²¹ and aligns it with the social purposes of the ISDoc genre, as this section and the following will argue.

²¹ The concept of *agency* has shifted interactivity in digital media experiences away from “a binaristic ‘choose your own adventure’” storyline to an “expansive, experiential conversation between user, artifact, and producer” (O’Flynn, 2012, p. 144).

The most comprehensive literature reviews on interactivity are offered by Alkarimeh (2019), Domagk et al. (2010), and Vázquez-Herrero and López-García (2019). Alkarimeh argues (2019, p. 50) that “interactivity is perceived as a multidimensional construct”, which entails two main issues in defining the concept. First, that the relation established in HCI is susceptible of being analysed across different factors or dimensions. As the author explains, studies examining the dimensions that define interactivity range from one to six dimensions, which implies further definitions and taxonomies involving, for instance, concepts such as ‘effort’, ‘responsiveness’, ‘complexity of choice’, or ‘reciprocal communication’, to name a few. This thesis does not consider these facets of interactivity. Rather, it defines interactivity in line with the second issue, namely the divide between *actual* and *perceived* interactivity. In the former case, interactivity is seen “as a characteristic, feature, property or capability inherent in a medium, or an interaction system that enables or facilitates an interaction between two parties” (Wu, 2006, p. 88), thus focusing on the ‘objective’ features of the medium that enable interactivity. The latter, on its part, implies “an individual trait, or message responsiveness perceived by an individual, or a psychological state experienced by an individual during an interaction” (p. 89). While these definitions seem to be clear-cut (even offering further and specific sets of dimensions) and partially functional in considering how users’ expectations and experience defines genre, integrating them directly into genre analysis may be insufficient in that it lacks the necessary terminology from the target genre to understand the role of interactivity in relation to social action.

Gifreu Castells (2013, p. 312) addresses the implications of this phenomenon for the ISDoc genre, claiming that “the polarisation in the terminological use” of ‘interactivity’ neglects the psychological aspect by which “the subject performs different processes of mental structuration (recognising objects, detecting messages, completing parts, etc.)” and which, in line with the ISDoc’s social action, edify users’ knowledge and/of the genre. In all, he concludes by stating that Manovich’s (2002) approach to *open* and *closed* interactivity fulfils this gap: open interactivity implies that “the artifact’s elements or structure is modified or

generated on the go as a response to user-generated interaction” and closed interactivity “uses the fixed elements in a fixed structure” (p. 40). Section 3.2.3 will establish a relation between these concepts and its discursive implications in the construction of the ISDoc text.

In the light of the approaches of IDoc theorists to interactivity, Gifreu Castells (2013, p. 301) explains that the label ‘interactive’ in the term ‘IDoc’ arises because “resulting navigation and interaction are produced from an intermediary called interface, a decisive aspect that links navigation and content” and because “it allows to understand that interactors play a key role in the communicative process”. Vazquez-Herrero and Lopez Garcia (2019) explain interactivity as “the user’s ability to act within the story and also with other users in multiple degrees, from control of the viewing [...] and content selection (non-linear access and navigation) to participation (sharing, discussing and contributing)” (p. 3). Nash (2014) offers a definition that underlines the parallel relation between computer and user into an ‘ecosystem’ that puts into play the different agents that participate in the construction of documentary: it is “a multidimensional phenomenon in which the actions of users, documentary makers, subjects and technical systems together constitute a dynamic ecosystem” (p. 51), further recognising the distinction between actual and perceived interactivity by acknowledging an ‘experiential dimension’ to it (p. 57). Miles (2014) states that, in fact, interactivity serves to delimit the “arena with less control and regulation” by posing that “while interactivity, broadly conceived, is often regarded as the addition of complexity and choice to what we make and how we view it, it is in fact best considered as a reduction, a choreography of the radically open of the virtual and the crystalline through the reducing interest of decision” (p. 71). And Gaudenzi (2013), in attempting to analyse the nature in which users ‘experience’ and end up manipulating the structure of the IDoc, defines interactivity as follows:

Interactivity is the ensemble of transformations that occur to the artefact’s components as a result of the human-machine interaction. Such transformation can affect heterogeneous components: the database (database expansion through user generated content), the interface (for

example random juxtaposition of images through algorithmic linking that creates new screens) or even the perception of space of the user (mobile content can change the perception of space by adding layers of content about a specific location). (p. 14)

The nature of interactivity can be demonstrated to be, on the one hand, technical, since analysing it is a matter of understanding the technical affordances of specific ISDocs and how they allow for different degrees of user participation to occur. On the other hand, the nature of interactivity is, at core, that of a multimodal sign: interactivity is reflected in a Web 2.0 multimodal text through different meaning-making cues. How users interpret and decode these cues is a matter of digital (and multimodal) literacy acquisition (Eshet, 2004; Birch-Becáas, 2021), but it also implies the recurrence of a series of actions that these same users take and their application in similar interactive formats. Therefore, interactivity should not only be defined in a purely technical view; considering how these technical materialities constitute the basis for user response and acquisition of digital skills in the Web 2.0 context should also be a matter of genre theory. Users apply their *uptake* of previous situations in interactive contexts in order to decode the technical cues that allow for this interaction, and, ultimately, text decoding (watching, reading, visualising, experiencing) to occur. Section 3.3 within this chapter will examine how the complete decoding process is established for these interactive ensembles. For the moment, the focus will be set on how the possibilities for interaction end up forming recurring structures within the web and departing from the linear model of narration.

3.2.2 Structuring interactivity

Before examining the ways in which IDocs and ISDocs (and other digital media products) exploit interactivity and arrange possibilities for interaction within their structure, it is necessary to revise the concepts of ‘narration’ and ‘narrative’ within the field of IDocs. Doing so may avoid a terminological conundrum that may arise in disciplines relating to linguistics, that may be narrower in scope when facing the assumption that these interactive media products are labelled as ‘narratives’.

Within the area of IDocs, the initial assumption, as exposed by Gifreu Castells (2013, p. 81) is that the aforementioned Henry Jenkins initiates the equating of the concepts of ‘interactive structures’ and ‘narratives’ by introducing the term ‘transmedia narration’. Section 3.2.1 explained the implications of the concept of ‘transmedia’ and how it became the central part of the duo when explaining the evolution of documentary. Nonetheless, it still fails to address the use of the second element. What is noticeable is that most preeminent studies in the field of IDocs (such as Gifreu Castells’, 2013) revolve around the use of ‘narrative’ to refer to their structure and content organisation without addressing the reasons for its use.

This thesis identifies two main influences for the exchangeable use of ‘narrative’ and ‘structure’ in these digital genres. The first is to be located within literature focusing on the matrix documentary genre. As seen in Chapter 1, early documentary practices imply the assumption that documentaries follow a ‘narrative storytelling’ organisation (Bradbury & Guadagno, 2020) by which the documentary *plot* is defined “on the most formal level, as an integrating dynamism that draws a unified and complete story from a variety of incidents, in other words, that transforms this variety into a unified and complete story” (p. 4). More recent studies such as that of Cohn (2013) mark the evolution from the most classical (even in the Aristotelian conception) event organisation towards what they call the ‘frame-based approach’, by which narrative in these genres emanates from the sequentiality assigned by users and viewers of documentary to a series of shots or scenes. In this sense, what the frame-based approach brings is a conception and use of the term ‘narrative’ which recognises the granularity and fragmentary nature of documentary contents even in the ISDoc era²².

Related to this, the second influence for the use of ‘narrative’ arises from a similar adscription of intentional relation on the part of users on what Manovich (2002) calls the ‘trim bin database’ (already mentioned in section 3.1.1). In the digital

²² Bateman, Wildfeuer, Hiipala (2017, p. 67): “Tracking the changes in media use is relevant for all studies of multimodal communication and surfaces constantly in discussions of media convergence and explorations of ‘transmedia’ phenomena—such as, for example, the question of whether games can narrate or in what ways narration in audiovisual media such as film is necessarily different to that found in more traditional narrative forms such as written text”.

medium, Nash, Hight and Summerhayes (2014) claim, “what were once fixed relations can now become a field of possible relations where the database affords selection (procedurally, programmatically, through user selection, or a combination of all three) between the shots and sequences that can be created” (p. 71). In this sense, narrative emanates in these interactive narratives from the very hypertextual nature of the web, which allows, more than cinematic shots, the availability of any material for inclusion in the structure of the IDoc. As Miles (2014, p. 72) states, this web affordance, together with the implementation of specific software (such as Korsakow), allows for the design of web narratives based on lexias and nodes, thus breaking traditional linear structures. Narrativity and interactivity, then, can be said to be more consistently equated after the transmediation of the matrix genre into a digital paradigm which presupposes interaction (HCI) and thus adscription of sequentiality on the part of users in the creation and decoding of the emergent genre of ISDoc.

Henceforth, this thesis will consider ISDocs to be structured according to a narrative logic. In this sense, the main models that are traditionally used in IDoc structural analysis are Gaudenzi’s (2013) and Nash’s (2012) frameworks for the classification of interactive narratives. Although both models offer similarities (and even shared labels) in the analysis, they differ in the focus they place in the role of interactivity: while Gaudenzi underlines the different modes in which users manipulate the platform, Nash focuses on the narrative structure that is conditioned by interactivity. Gaudenzi’s model explores interactivity in four different modes: (1) the *conversational* (in which ‘the assumption is that to interact with a world is like conversing with it’ and tries to open endless possibilities through an infinite database, p. 21), (2) the *hitchhiking* (or hypertext, in which users explore a predetermined narrative established by an algorithm), (3) the *participatory* (in which the documentary allows for the ‘scalability’ of the database through users’ contribution, p. 55), and (4) the *experiential* (which encourages user’s participation in experiencing real conditions in a physical and open environment). Nash’s model investigates interactive narrative through three main modes: (1) the *narrative* (replicating linear documentary narratives), (2) the

categorical (which makes use of different elements that do not follow a linear sequencing but are grouped within similar topics or interests), and (3) the *collaborative* (in which the narrative is subservient to the organisation of users' contribution). Further approaches that are to be commented in the following sections of this work have also shed light on the ways that narrativity is structured in this genre; nonetheless, Gaudenzi's and Nash's remain the core models within the IDoc's field of practice.

The choice in different potential interactive structures comes with an impact not only at a level of perceived interactivity, but also, as Webster and Ahuja (2006) state, "will influence the levels of engagement, disorientation and ultimately the performance of users" (p. 672). In relation to how these interactive structures contribute to the 'picking up' of science, it is necessary to question whether making use of these interactive ensembles truly fulfils the Documentary Contract's 'Active Edifying' clause, or whether audiences find it difficult to balance (1) the cognitive load of learning how to navigate the interactive platforms with (2) understanding and engaging with the contents of the documentary.

Several authors align with the view that the choice of different interactive structures helps fulfil the genre's social action at no cost of engagement with the contents. For instance, Bonino's (2010) exploration of three IDocs (with different interactive modes) leads to the claim that interactivity is indeed exploited 'at best' when included in any interactive mode, but that the relation of the VURPs with the platform "could have actual repercussion on the way we perceive reality" (by means of interaction between users, for instance) (p. 3). Aston and Odorico' (2015) examine how the relational facet of interactivity in the genre allows for a 'polyphonic' exploration of "complex ideas as opposed to expecting to be delivered specific ideas or arguments" (p. 83). In Vázquez-Herrero's (2021) study on the effects of nonlinearity and interactivity, "the narrative fragmentation and the freedom of navigation, as well as the multimedia construction, lead to an improvement in the experience and cause the user to reach a higher degree of engagement" (p. 1428).

On the other hand, other authors diminish the impact that different interactive structures have on engagement and comprehension of scientific contents. Podara et al. (2021, p. 5) counterbalance SD's sense of narrative and low interactivity with IDocs' low degree of *narrative efficiency* and high degree of interactivity, leading to engagement with other users and even authors. Upon examination of the famous ISDoc *Bear 71*, Pettengill (2017) reached the conclusion that, throughout the experience, 'learnability' of the digital platform (it being a *complex* interactive structure) was somewhat achieved, but participants were mostly confused about the mechanics of the narrative progression and their objective as a character within the narrative. Alkarimeh's (2019) study shows that the degree of interactivity affected perceived interactivity (and correlated with perceived involvement and attitude toward the website); nonetheless, the study also demonstrated that participants in the low-interactivity condition showed a greater narrative engagement than participants in the high-interactive condition. Finally, questioning the ISDocs "limited opportunities to persuade" by analysing different structures under the optics of Audiovisual Rhetoric, Forceville (2017, p. 8) ends up claiming that "the freedom of the user in interactive documentary comes at the price of proportionally reducing the maker's power to argue, and considerably increases the risk that the user will prematurely stop engaging with the documentary – or not even begin to do so".

At this point, it has been established that interactivity (as a communication process) is able to expand users' choices in structuring the contents of the genre upon direct communication with the database to different degrees. What remains unclear (and possibly, without an answer at this stage) is whether the choice in potential interactive structures leads to a greater degree of engagement with the ISDoc's contents. For the purposes of this thesis, what is interesting about this potentiality is that it could be possible to articulate the 'product' of these arrangements in linguistic terms: as long as the ISDoc genre and its (transmediated) social action posit that users actively edify knowledge in a manner allowed by the potentialities of the digital medium, the resulting texts accordingly show differences depending on the way the interactive choices that the users enact

on the narrative. This echoes Nash's (2014) words about the discursive dimension of IDocs:

The structure of interactivity has the potential to be rhetorically significant; in effect an argument is made because of the way in which possible user actions are structured. Many web-documentaries have a categorical structure, organising information by establishing rhetorically significant categories and inviting particular forms of comparison. (p. 58).

In this sense, it is then feasible to state that even interactivity *itself* can be understood as being materialised and linguistically articulated in the ISDoc narrative structure and texts, considering interactive cues to be 'triggers' of text decoding. Accordingly, an analysis of these interactivity cues should aim at understanding the material conditions that enable them, but also the shape that these cues adopt and their function in the text.

3.2.3 Interactive Sites/Signs

In contrast to the myriad of studies that analyse interactivity, there is a paucity of those that explore its relationship with its discursive function. Adami's (2013) consideration of the *interactive sites/signs* (the interactive cues that are responsible for enabling the users browsing and navigating stances and thus text decoding) can be accountable to fulfil this gap and to answer questions related to how the user interacts with the multimodal, interactive cues. Adami defines interactive sites/signs as such:

Online interactivity is physically activated through clicks or touches to a (keyboard/mouse with effects onto a) screen, which consequently changes its appearance. Semiotically, the actions performed onto certain signs of a given text produce some textual changes. Socially, by doing something at given sites of a digital environment, the "user" obtains something from it. [...] Digital texts have "interactive sites/signs" such as links, buttons and fields, which enable users to act upon the text. The two-fold label "site/sign" is adopted here to indicate that they are both places (sites) where the user can act and signifiers associated to signifieds (signs) sharing a meaning

component which could be verbalized as 'here you can act and obtain some effects. (p. 5).

In spite of proposing these sites/signs as linguistic in origin, Adami defies a purely textual (semantic and pragmatic) interpretation by stating that the signifier is meant to “be manipulated, or perform its interactive functions” (p. 5). Accordingly, Adami classifies sites/signs depending on the forms, actions, and effects which engage users' actions.

Forms refer to the systems of representations that characterise the interactive sites/signs: Adami goes on to claim that ‘certain forms have, conventionally, the potential to signal interactivity’, thus creating a specific grammar that comes to be ‘accustomed’ by users in interactive text decoding. Indeed, Miller and Shepherd (2004) signal these ‘formal features’ as a ‘common ground’ for genre recognition, and go further by claiming that these distinguishing features create connections between the community of agents that take part in the genre. In the case of digital genres, and following Peircean semiotics, the iconicity of certain forms allows for users with a relative average digital literacy to understand the meaning implied in the most commonly widespread forms; something which is also applicable to the ISDoc. *Actions*, for Adami, involve the role of sites/signs as activators: they can be triggered by clicking and typing, or hovering over them with the cursor. In the case of actions, there is not a univocal correspondence between the materiality and the effect they produce, thus being configured in the experiencing of the text. Finally, and similarly to actions, *effects* trigger a small range of outcomes that “enable the user either (1) to access new text, or (2) to provide text, or else (3) to transfer text to others” (p. 7). The effective changes that the webpage can experience are limited to two: either opening a new window, or the page changing in modification of the text.

What is remarkable about the interactive sites/signs is its functioning within the page in which they work. The sites/signs function in a spatial dimension (the page in which they appear) and an intertextual dimension (the change they produce in the text), which indicates that they develop in space and time. For Adami, this nature shows that sites/signs can be analysed syntagmatically (how it makes

meaning in combination with other elements in the page) and paradigmatically (how its selection triggers ‘possible textual realisations or paths’), which reminds of Manovich’s open and closed interactivity stances.

Adami’s model is interesting in that it offers an approach to classifying the interactive nature of the medium-framed stimuli that are found in digital genres. Adami completes the framework by putting Halliday’s (1978) metafunctions into play (Table 3.1). Apart from mapping the syntagmatic and paradigmatic realisations onto the metafunctions, the author further includes an additional item (‘Interactive value’) which relates to either the base text without interaction (‘aesthetic’ value, with its original form “before it is actualized, experienced, and performed”, p. 10) or the potential choices and textual modifications upon interaction (‘structural’ value).

Table 3.1
Metafunctions and dimensions of ISS

Dimensions	Ideational function	Interpersonal function	Textual function	Interactive value
Syntagmatic (within the page)	What it is - signifier/signified	What it says about - authors - users	How/Where in the page - salience - info structure	Aesthetic (the aesthetics of interactivity)
Paradigmatic (optional realization)	Which action which effect where	Directionality/power: - Who towards whom: author/users/others	Before-after Given-New	Structural (the structure of interactivity)

Note. From “A social semiotic multimodal analysis framework for website interactivity”, E. Adami, 2013, p. 9. (permission to be reproduced granted by Sage, see <https://s100.copyright.com/AppDispatchServlet#formTop>).

Adami’s ISS theory offers a model that accounts for the possibility of *textualising* (in simple terms, ‘putting into words’) interactive ensembles without eliding potential ramifications or sequencings of their structure that arise from individual usages. More than that discursive and structural affordance, it provides a linguistic view of interactivity itself that considers how the sites/signs fulfil different metafunctions (from the optics of Systemic Functional Linguistics, SFL henceforth) and can thus create synergies with linguistic disciplines that explore the social semiotic dimension of digital communication. On the part of multimodal analysis, ISSs merge Lemke’s (2002) functional specialisation of

language and image: they are the point of joining between language (and the representation of sequential relations since they needed to be acted upon in order to advance ‘textually’) and image (and the representation of spatial relations). On the part of pragmatics, as sites for action, ISS demonstrate how contextual choices (that are multimodally systematised) marked by the immediateness of the digital medium represent not only textual sequencing within variable structures, but also how the users end up establishing interpersonal relations with the text creators and even directly with other users within the platforms. Ultimately, it also alludes to how these actions are transmediated, following Elleström’s framework, from matrix genres into emergent genres.

Within genre theory and the objectives of this thesis, ISS theory is an applicable tool for the analysis of how interactivity fulfils a text decoding function in the ISDoc genre. While its application sheds light on the relation between interactivity and linguistics, some issues are still unanswered. For instance, the ISS theory does not address how medium-specific affordances constrain what is considered ‘interactive’ across platforms. Moreover, it fails to recognise overarching structures such as those shown in the previous section and how interactivity contributes to the arrangement of nodes and lexias within ISDoc texts. Ultimately, in strict Genre terms, this theoretical view may be halfway in helping to understand the extent to which interactivity (1) determines the status of the ISDoc digital artifact as a ‘site for contention’ (Miller, 2014) in the transmediation from the SD and (2), on the part of users, implies new procedures for sense-making harnessed by medium which ultimately align with the genre’s social action. To answer these questions, this thesis introduces the concept of *hypersemiosis*.

3.3. HYPERSEMIOSIS

The inscription of the prefix ‘hyper’ is not alien to the study of signs (‘semiosis’). In fact, as a sign theory, ‘hypersemiotics’ (not ‘hypersemiosis’, the concept introduced in this thesis) serves to expand the range of conventional and structural semiotics that are entrenched in “an all-round falsehood culture, artificiality and

superficiality” (Ginting, 2021, p. 87). It operates by “emphasizing or relying on the principle of intertextuality, thus requiring data in the form of original signs or references to assess the nature of ‘hyper’ and see the interdependence of signs that occurs” (p. 88). Although it is a suitable term for lines of investigation which question the social contexts of sign production²³, and also a concept that could fit in filmic analyses, I believe that the ‘hyper’ prefix can be further developed (or rather, ‘remediated’) to describe a different phenomenon within the 2.0 paradigm. So, why hypersemiosis then?

Firstly, and given that the target genre of this investigation is the *Interactive Science Documentary*, it would seem logical that the concept of ‘intersemiosis’ would be the preferred term. Nonetheless, there are three reasons that preclude this possibility. In the first place, and most obviously, the notion of ‘intersemiosis’ has been used within the area of translation to designate the processes of transcribing language between different media (see Dusi, 2015), something that is divergent from the purposes of genre studies. In the second place, and more in line with procedures of meaning-making, the reminiscence to ‘interactivity’ (and its definitions, as exposed in earlier sections within this chapter) may be too focused on the process of communication between human and machine and the extent to which the former can produce modifications in the latter’s structure. Finally, and following the application of the concept in studies such as Francesconi’s (2016) analysis of webpages hypermodality, the focus of intersemiosis seems to be placed on the relation of the meaning-making cues within the page (something which Adami’s interactivity framework fulfils) without dealing with the potential structuration of these cues that users apply in the navigation phase.

Overall, I deem ‘hyper’ a more adequate affix to capture the narrative and sequential nature of users’ meaning-making procedures within the narrative, since it better encapsulates the aforementioned idea (see section 3.1.1) that every digital interface is inherently a hypertextual one. These hypertextual arrangements are structured, as explained by Aarseth and Finneman, in terms of nodes, and more

²³ Moreover, the concept seems rather reliant on post-structuralist accounts of intertextuality, as explained in Piliang (2019).

importantly, *lexias*. Section 3.2 in this chapter considered that this articulation is a metaphor in use by film and documentary theorists and programmers. As such, it is located as a crucible concept between the two disciplines that anchor this investigation, as the next section will illustrate. Additionally, I believe that ‘hyper’ reminisces the ways in which users explore an interface. The *lexias* are something that are predisposed by the author, but that must also be ‘arrived at’ by experiencers of the structure. This fact problematises the existence of *lexias* as elements that need to be deciphered and interacted with in order to work within the narrative. As individual ‘pieces of meaning’, hypertextualised *lexias* are not but isolated and multimodal ‘chunks’ that only make sense when orchestrated into a wider structure.

This inevitably leads, as earlier discussion did, to the consideration of the browsing-navigation stances for the purposes of genre analysis displayed over a narrative structuration. In the search for *lexias* that serve to articulate an overall textual meaning, users engage in different processes of deciphering of the materials. Understanding the interactive text becomes a quest to make sense of not only the isolated materialities, but also of the hypertextual ramifications that connect them and lead to satisfactory and successful comprehension. Users must make sense of these ramifications: they must provide *sequentiality* to physical stimuli that form the narrative. Hence, the ‘hyper’ transcends the pure definition of ‘multisemiosis’ or ‘hypermodality’ by assuming that the navigation within the narrative structure implies more than the existence of different modes that are to be deciphered, but that the virtual web that connects them, with all the cues and clues (such as the ISS) that vectorise the narration, must also be deciphered by means of *paradigmatic* interaction. Ultimately, ‘hypersemiosis’ becomes a metaphor to explain the active processes of meaning-making that occur from the experiential level of computer-mediated multimodal stimuli to the upper levels of discourse, genres, and narrative(s).

Departing from this point, it is necessary to analyse the fit of the concept of *hypersemiosis* with the following two frameworks in order to expand its range of applications.

3.3.1 Three anchoring frameworks

This section brings together the theories that characterise the hypersemiotic framework. As hinted in the previous paragraph, two additional frameworks need to be revisited and integrated within this thesis. Still, the hypersemiotic framework could not be complete without the reviewed ISS theory (Adami, 2013; see section 3.2.3). I will omit ISS theory for the moment to leave room for the rest of the theories, but its integration will be further analysed in section 3.3.2.

Bateman's multimodal semiotic framework

Bateman's development of the GeM (*Genre and Multimodality*) model from 2008 onwards aimed at providing an "overarching scheme within which genre could be explored multimodally and by which the additional design constraints required for particular classes of documents could be empirically investigated and formally specified" (Bateman, 2013, p. 51). What spurred interest from earlier versions of the model was (1) the possibility of analysing not only *static*, but also *dynamic* documents and (2) the acceptance of "the importance of artifact materiality", by which the "physical properties of the artifacts under investigation must also be considered for their potential contributions to meaning-making". In that sense, the target of the GeM model was set on the so-called *virtual artifact*:

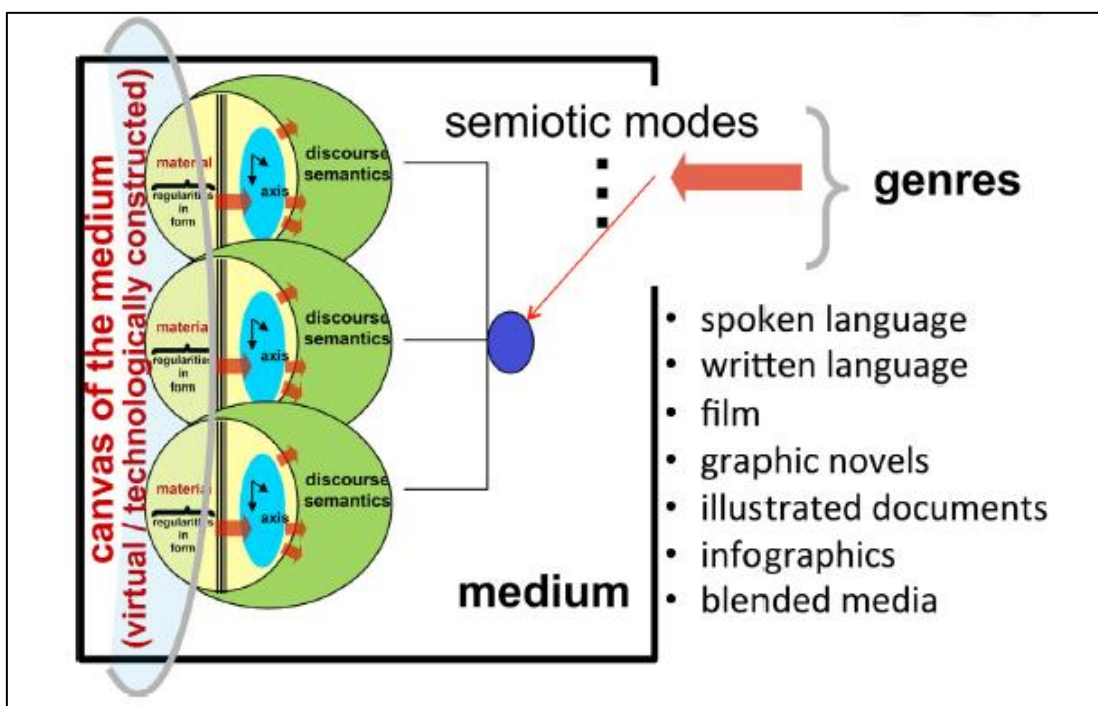
The virtual artifact is the 'material' that is accessible to design decisions by virtue of both the actual physical properties of some material and available technologies and practices for using that material. Genres are then carried by the virtual artifact rather than the physical material directly. The reason for this extra level of indirection is that genres as social constructs may maintain themselves even in the face of changing physical properties (Bateman, 2013, p. 52).

The importance of the virtual artefact for genre analysis arose from the consideration of its development, which took into account "historically-situated social practices with the help of particular technologies of production and distribution" and how the "communicative uses of those artifacts" led to the emergence of particular modes of expression (p. 54).

In further revisions of the model, Bateman included a more specific focus on the role of *medium* (media) and *modes* in the development of virtual artifacts. The approach to *medium* was essentially the same as Elleström's (see section 3.1.2). Nonetheless, the revision of the model was most noticeable when considering the functioning of *modes*. As such, Bateman (2017) “extends the notions of Kress, van Leeuwen and colleagues by defining a ‘semiotic mode’ as a doubly stratified configuration of semiotic resources together with the materialities that those resources engage” (p. 8). Accordingly, the model is a three-part one: the first stage involves the *perceptible materialities* and how they trigger the semiotic processes of meaning-making; the second involves the ‘*systems of alternatives*’, that is, the regularities (or the ‘grammar’) that are ‘responsible for carrying the meanings of the semiotic mode’; finally, the third stage, that of ‘*discourse semantics*’, is responsible for ‘correlating the structural configurations with contextual interpretations’. How different semiotic modes correlate within a specific medium is the basis for analysing the genre of ISDocs through its materialities (see Figure 3.2).

Figure 3.2

Abstract schematic representation of semiotic modes and medium relationship



Note. From “Triangulating transmediaity: A multimodal semiotic framework relating media, modes and genres”, by J. A. Bateman, 2017, in *Discourse, Context & Media*, 20, 160-174. Reprinted with permission.

Section 3.1.2 formulated some questions about Gaudenzi’s view on transmedia documentary, namely:

1. What does ‘move from one media to the other’ mean?
2. How is the process carried out, and how do users get ‘the full picture’ in the flow across platforms?
3. What defines and separates one medium from another?

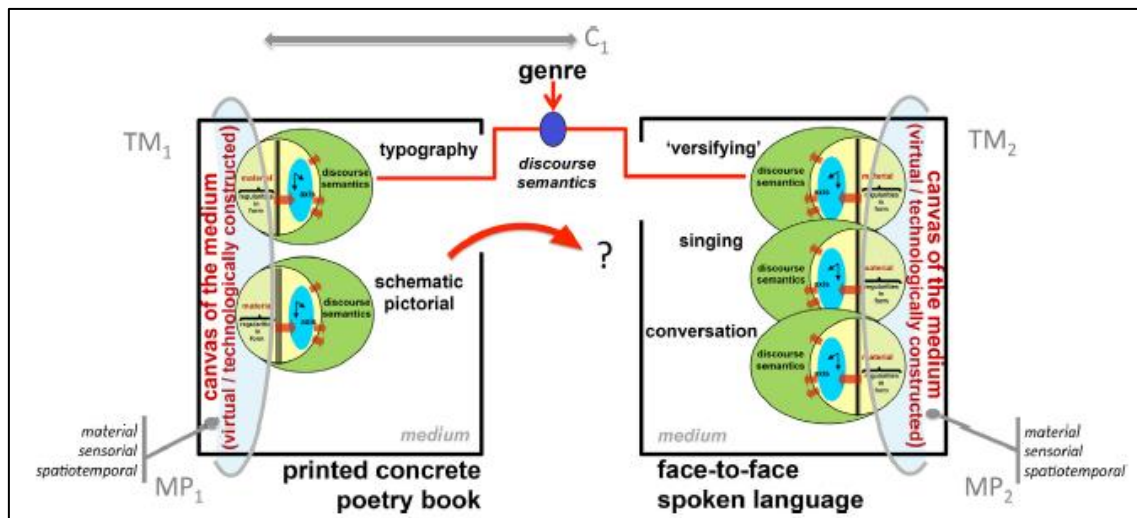
The full overview of Bateman’s model is accountable for how the transmediation of the SD into the ISDoc is produced (see Figure 3.3). Moving from one media to another involves recognising how the *canvas of the medium* shapes the possibilities for the semiotic modes’ materialities and its realisation in discourse semantics. As an example, in the case of the SD, the semiotic modes could include those related to the construction of the authoritative, objective “voice of God” (aurally articulated); for ISDocs, the canvas of the digital medium could potentially be

transmediated given the similarities and affordances to the matrix genre. The model further allows to delineate the specific semiotic modes that are put into play for individual texts. Moreover, the semiotic modes approach is critical in evaluating ISDocs interactivity as a core configuration of the genre. In fact, Miller and Shepherd (2004, p. 7) also make similar assumptions about the generic semantic content of genres. Nonetheless, and in the case of the ISDocs, these contents are of a multimodal nature, thus expanding the materialities that are part of the interactive features. Ultimately, the notion of *virtual* artefact aligns the status of the ISDoc as a historically situated creation that is susceptible of being analysed under the scope of genre theory. In all, the approach that will be followed and developed in Part 2 within this thesis, more than focusing on a ISDoc prototype to account for the whole process of transmediation from the SD, will consider individual texts so as to examine the different materialities put into play in the genre. In that sense, therefore, the hypersemiotic model will offer a reduced version of Bateman's based on the following affordances:

1. Identification of the transmediated components of the SD into the ISDoc.
2. Identification of the transmediated components of genres hybridised in the ISDoc.
3. Identification of the materialities/media characteristics afforded by ISDocs.

Figure 3.3

Representation of transmedial relationship mediated by discourse semantics and genre



Note. From “Triangulating transmediality: A multimodal semiotic framework relating media, modes and genres”, by J. A. Bateman, 2017, in *Discourse, Context & Media*, 20, 160-174. Reprinted with permission.

Koenitz’s theses for Interactive Digital Narratives: the SPP model

Interactive digital narrative [IDN] is a narrative expression in various forms, implemented as a multimodal computational system with optional analog elements and experienced through a participatory process in which interactors have a non- trivial influence on progress, perspective, content, and/ or outcome. (Koenitz, 2023, p. 5).

Koenitz’s works on Interactive Digital Narratives conceived the advent of different “incarnations as interactive drama, hyperfiction literature” etc. as both an opportunity for “artistic expression” and “a challenge to existing concepts in narrative theory” (2010, p. 1). The concept departs from the aforementioned discussion (see section 3.2.2) on how software implementations allow for different structurations of contents in digital genres. More specifically, the concept arises as a response to the practice of *narrative fundamentalism* (2023, p. 26), that is, the “severely restricted conception of narrative that has become normalised” given the status conferred by Eurocentric / Western critics to concepts such as ‘story arc’ or ‘myth’ and which goes in line with the conception that games (and, extensively, IDNs) are forms that, while able to support narrative structures, fail to properly

fulfil their ‘entertaining’ function. As such, the ‘narratology v. ludology debate’ (the latter enforcing views related to narrative fundamentalism) serves as Koenitz’s point of departure to “position IDN as spaces for novel and experimental forms of narrative” (p. 38), thus embracing the narratological side. In his *Five Theses for Interactive Digital Narrative* (2014²⁴), Koenitz calls for a specific ‘New Narratology’ which (1) deals with ‘fuzzy concepts’ and reframes previous work on IDNs (such as Murray’s 1997 affordances and phenomenological qualities of digital media and Ryan’s 2006 “concept of storyness as a scalar property combining story/discourse” (p. 3); (2) has interoperability across systems which support IDNs (which resonates with the principles of OS and collaboration tackled in Chapter 2); (3) is sustainable; (4) is ‘author-focused’, in the sense that it is able to endow digital creators with a framework for the creation and development of new IDNs; and (5) gives prominence to the user’s experience, enlarging potential audiences for IDNs.

In this sense, Koenitz’s initial proposal (2010) already understood IDNs as “dissimilar to narratives in legacy media [such as printed page or film]” (p. 180) and, drawing on Montfort (2005), he stated that while IDNs were not themselves “a narrative, but an interactive computer program”, a narratological framework could be useful in defining its key components. The fundamental distinction that operated based on these assumptions was that the “material artifact”, that is, the computer architecture that supports the narrative, was a different entity to the “output”, a particular instantiation²⁵ (or “walkthrough/playthrough” in the IDN). Consequently, the traversing from the initial system to the final product implied a three-step model (the SPP model) which considered the *system* as the digital artifact (“the executable programming code and assets”) that contained the “potential narratives” (p. 179), the *process* stemming from users’ engagement with the system, and the *product*, or the instantiated narrative.

²⁴ They are further developed in works focusing on the educational approach to IDNs (Dubbelman, Roth & Koenitz, 2018) and the academic implications of establishing such discipline which “are significantly affected by the lack of a disciplinary framework” (Koenitz, 2018, p. 4).

²⁵ A concept extracted from Giddens (1987) that reminisces of Miller’s idea of genres being instantiated (which implies change and stability) through rhetorical communities’ use.

The system as space of potential narratives is what Koenitz names *protostory*. What the use of the concept of protostory allows is to merge the traditional narratological concepts of ‘fabula / story / histoire’ (the ‘what’ of a narrative) and ‘syuzhet / discourse / plot’ (the ‘how’)²⁶, something which has considerable generic implications in defining IDNs and, ultimately, the ISDoc genre. The joining of story (the genre’s contents) and discourse (the genre’s macro-structure) draws on Ryan’s (2006) interpretation of both categories²⁷ as not being separable and understanding narrativity as a scalar property, by which the multiplicity of meaning-making cues of the media contributes to the users’ representation of the content, and vice versa. Ultimately, what Koenitz (2023, p. 72) proposes with its concept of protostory is that, in a digital medium (“a procedural environment that requires a participatory process”), both the content and macro-structure elements that conform an IDN or, in general, an interactive genre, are interdependent, malleable, and dynamically changing upon user interaction.

Although Chapter 4 will provide a deeper understanding in terms of applicability of Koenitz’s concept to the analytical framework for ISDocs, it is now worth considering how the elements of the protostory are arranged based on the dynamic relation between story and discourse, and how the SPP is further reinterpreted to cater for another dimension of user traversing of the IDNs. System protostories in the 2023 reinterpretation feature four different elements as compared to the previous model: ‘Procedural Components’ (previously ‘Environment Definitions’), ‘Assets’, ‘UI’ (previously ‘Settings’) and ‘Narrative Design’. *Procedural components* refer to the set of rules in which the narrative is developed (in the case of ISDocs, and taking into account the Documentary ‘Truth’ clause, procedural components within the protostory try to mimic those of reality²⁸); the *UI (user interface)* includes the controls at users’ disposition; *assets* “are all the static elements being

²⁶ Concepts adapted for games studies disciplines in Nitsche (2008).

²⁷ Which she calls ‘cognitive representation’ and ‘representation encoded in material signs’ (p. 7).

²⁸ Procedural components create rules for interactors’ use of the platform. In games, for instance, a door can be opened with a key. If that condition or rule is applied, the game progresses. As Koenitz states: “More advanced *procedural components* enable the creation of new items or structures [...] They can also embody societal rules” (p. 77-78), which reinforces the idea that the IDN’s technical structure refers to a set of *societal constraints* (and user abiding by those rules) that constantly reshape it.

used in an IDN work and include 2D images, 3D models of characters, landscapes and buildings, text, video, sounds, music, and recorded speech” (p. 78); and *narrative design* implies the sequencing of material provided by the other elements. The latter element includes *narrative vectors*, sub-structures which “provide motivation to the interactor, help to retain a level of authorial control, and move the narrative forward”. Koenitz finally includes methodological guidelines for the application of the model in IDN analysis.

Apart from the reinterpretation in protostory’s elements, the 2023 SPP model highlights a dual function of the instantiated product. Of course, interaction with all the system’s possibilities produces an output which can be ‘quantifiable’, in the sense that users’ choices can be physically recorded and account for an individual instantiation. Nonetheless, the way in which users make sense of their own product is also accountable as a narrative product itself. Koenitz considers this reviewing of the narrative experience as a ‘retelling’ (p. 75), or the ‘subjective product’ that differentiates from the ‘recording’ or ‘objective product’. Ultimately, and drawing on Giddens’ structuration and instantiation theory again, users’ understanding of the instantiation and product constructs a “triple hermeneutic”: (1) the *system/protostory* implies the ongoing wondering for interaction possibilities, (2) the *process/instantiation* implies the interpretation of the product, (3) and the *product/story* implies the reflection of prior traversals and the potential for replay.

In the step from IDNs to ISDocs, the methodological framework of the 2023 SPP model equally offers analytical tools that are applicable to those in the field of Rhetorical Genre Studies and, ultimately, the hypersemiosis framework. I review the four main affordances:

1. Assets: The ‘static elements’ used in an IDN are subject to be analysed as those ‘semiotic modes’ explained in Bateman’s theory. The experiencing of any materiality definitory of the genre (Bateman) is subject to changes within the ISDoc system (Koenitz) as a result of users’ interaction on both story and discourse. This reinforces Miller’s (2016) idea that audience’s interaction, as projected in discourse, affects the use of the genre.

2. Narrative design: The dynamic combination of all the elements of the protostory and its instantiation within the narrative structure helps define the interactivity possibilities in the hypersemiosis framework.
3. Narrative vectors' functions (motivation, control, and movement) are subject to being interpreted under the optics of the ISDoc. What does it mean for a user 'to be motivated' *while navigating an ISDoc*? What does it mean 'to maintain authorial control' *while designing an OS genre such as the ISDoc*? What does it mean 'to move the narrative' *in a genre which features narrative and scientific contents*, and how are they hierarchised?
4. Instantiations and retellings (the triple hermeneutic): The SPP model caters not only for the potential on-the-go adjustments that users make while navigating IDNs, but also for how these users reconstruct their experiencing of the narrative and how they can exploit it in further genre usage.

The limitation of the SPP model for RGS is evident, in that the framework does not contemplate how the meaning-making cues in the protostory end up configuring a genre, or how the genre ends up being reconfigured through users' instantiation. Nevertheless, its focus on the system elements that bind story and discourse ('what' and 'how') within digital environments, and its consideration of user interaction and reflection of how his/her own interactions and outputs define the narrative are what ultimately helps explaining the transmediation of the ISDoc genre through the process of hypersemiosis, a double potentiality that already laid at the core of the 2010 SPP model:

Not only does the participant create a mental model of the emergent story, she also speculates about the consequences of her own actions for the narrative, assesses her level of control, and as a result formulates and executes strategies of interaction. This additional plane of consideration and control is an important factor that distinguishes IDN from legacy non-interactive forms such as the novel, or the movie. (Koenitz, 2010, p. 180)

3.3.2 Hypersemiosis within Rhetorical Genre Studies

As defined in the previous section, the concept of hypersemiosis brings to the fore a comprehensive view of how users make sense of digital genres: first, experiencing the varied materialities and assets that are afforded by the hypermodality of the web; and finally integrating them into hyperlinked structurations or instantiations which are susceptible of being analysed at a discursive level. As seen through the previous chapters, the concept has been arrived at by considering the place of a specific genre, the ISDoc, within a determined social and technological context. This analysis has been grounded in the manner of similar investigations carried out by Miller and Shepherd (2004; on blogs) or Kelly (2014; on parascientific genres), thus situating this thesis within the Rhetorical Genre Studies tradition. In that sense, what is the place of the concept of hypersemiosis in the RGS tradition, and how could it contribute to it?

The concept that set the RGS tradition in motion was Miller's social action, which, in the context of this thesis, implied analysing the aforementioned contextual conditions or the *kairos* for the ISDoc genre. Chapter 1 reviewed the evolution of the documentary genre into the IDoc in the context of the Open Source genre and the democratic arena of the Internet; Chapter 2 analysed the genre in the context of the matrix Science Documentary genre and similar genres of science communication in the Open Science paradigm; Chapter 3 has reviewed the technical affordances that make the phenomenon of hypersemiosis possible. The fact that the explanation of the *kairos* or social action of a genre has been necessary in order to historically situate the cultural artifact does not imply that hypersemiosis is not functional outside this investigation. Rather, it reaffirms the necessity of combining different methodological approaches in order to better understand how genres are projected onto different areas of communication.

Moreover, it could be argued that hypersemiosis arises and comes to explain a determined moment of *kairos* that is pervasive to digital genres. For genres that arise as a result of a process of *innovation* or *emergence* (see Chapter 1; Miller, 2016), hypersemiosis is present in assuming the inherent hyperlinked architecture of the web that supports them. The contribution of Elleström's (2016) views on media

transformation opens the possibility of providing detailed descriptions of a genre's materialities, thus allowing to understand either the stabilisation of genres or the 'unrepeatable contingency' (Miller, 2016, p. 16) that makes genre emergence possible.

Another conclusion can be drawn for the pervasiveness of hypersemiosis in the digital kairos. Chapter 2 discussed how different discourses come to appear together and erode the 'traditional sphere of scientific discourse' (Trench, 2008) in academic and vernacular genres. The concept at play here is that of *hybridisation* (Mäntynen & Shore, 2014), which is characteristic of 'new and emerging genres' (p. 751). If hybridisation is assumed to be a phenomenon tied to genre innovation and emergence in Web 2.0, then hypersemiosis can be helpful in determining the articulation of the 'blended' discourses in these digital genres. Ultimately, a side effect of this analysis can lead to a better understanding about how embedded genres work within hypermodal hybridised ensembles; or even to be able to characterise genre sets and systems.

Two other concepts in the RGS tradition are engaged in the conceptualisation of hypersemiosis. The first one has to do with *uptake* (Freadman, 2002), defined as 'the ability to know how to negotiate genres and how to apply and turn genre strategies into textual practices'. For Freadman (and in a similar way to the way Giddens explains Structuration theory, 1984), genres are defined by the uptakes they condition and secure within 'ceremonials' (or the 'performance' of the genre). For a digital genre, and as users navigate through the text, they make sense of its discursive actions that help it constitute a certain genre (for instance, for the IDoc, assuming that certain conventions such as the 'authoritative voice of God' enact the 'Truth' Documentary clause). But more than that, under the optics of hypersemiosis, this digital genre uptake implies that users also make sense of the hyperlinked structure that characterises these digital texts. In other words: users *assume* that, inherently, digital genres are going to feature, to a lesser or greater degree, an interaction with the computer in order to make sense of the genre. What this means is that digital genre uptake is closely related to users' digital literacy

and the strategies deployed to navigate digital texts with varying granular structures.

The final concept underpinned by hypersemiosis is that of rhetorical communities. As described in Chapter 1, these communities are characterised by their ‘virtual’ character (Miller, 1994): they enact the genre not always through direct collaboration between its users (what is defined as a ‘relational’ community), but by similar discursive practices that these users take when participating in the genre even if there exists no established connection between them (a ‘taxonomic’ community). The concept of ‘rhetorical communities’ was first brought up in 1994, when the Internet had not developed the full range of affordances or capabilities that we know today. Nowadays, the technologies that are part of digital genres open the possibility for new ways of interacting and establishing these communities. In that sense, the hypersemiosis framework is based on the assumption that digital texts may enact these channels of interaction and integrate them within their architecture. For instance, we could consider the presence of SNS buttons in IDoc texts, (typically) allowing to share the text; or ‘Comment Sections’ which allow user discussion. The existence of these opportunities for interaction shapes the construction of the genre, as they constitute textual lexias embedded in a hypertextual structure; in turn, hypersemiosis can also explain how these opportunities for interpersonal interaction help characterise specific digital rhetorical communities.

To close this chapter, the following list provides the key concepts that characterise the concept of hypersemiosis and anchors it in the RGS tradition:

1. Multi/hypermodality: Drawing from Bateman’s (2017) theory, hypersemiosis assumes that semiotic modes constitute the basis for the characterisation of digital genres. These genres draw from the multimodal possibilities afforded by Web 2.0 (the canvas of the medium) and select those materialities that better suit the enactment of their social action. In assuming this, the hypersemiotic framework allows to (1) analyse the similarities in terms of materialities that recurrently appear in texts or genres; (2) explain how the processes of media transformation occur

between legacy media and interactive contexts (under Elleström's 2017 framework), thus exploring the processes of innovation and emergence; and (3) turn these multimodal and interactive cues into discursive actions that are required in the Human-Computer Interaction (as explained through Adami's 2013 Interactive Sites/Signs).

2. Sequentiality: The relations established through hyperlinking by the multimodal cues are susceptible of analysis, specifically under Koenitz's views on Interactive Digital Narratives. The hypersemiotic framework firstly draws on the kind of hypertextual operations that link the lexias together (such as the narrative vectors and the functions they play within the text); then, it explores, in a scaffolded manner, the possible instantiations (or 'retellings') and comes to conform different products out of the arrangement.
3. Agency: Tied to the previous point, the hypersemiotic framework assumes agency as the inherent requirement for digital genres. It is based on several aspects. Firstly, it is the necessary condition for genres to participate in the digital kairos of 'participatory culture' (Jenkins, 2006). In turn, participation structures and determines the evolution of these genres through increased opportunities to collaborate and even edit and authorise the texts. Secondly, it pinpoints the fact that texts are construed or instantiated *individually*, that is, through individual users' particular exploration of the texts. This means that texts are susceptible of being construed in different ways, perhaps through recurrent actions that are dependent on user uptake or by author design based on open / closed interactivity (Manovich, 2002). Finally, individual agency raises questions about the efficiency or effectiveness in the use of genres for different purposes, thus allowing us to understand authorial design in the light of the genres' social action.

Hypersemiosis, as understood within this thesis and the case of ISDocs, fulfils a dual function: on the part of semiotics, it serves to explain how the active interaction of human actants upon the digital artifact by means of the hypertext transforms the stimuli into a structuration of meaning which is dependent on

users' choice and schemata for understanding; and on the part of the ISDoc as genre, it reinforces the idea that the Documentary Contract, in both its 'Truth' and 'Take action' clauses (as explained in Chapter 1), has experimented a remediation of its social action which goes hand in hand with the same physical* (interactive) procedures that are needed for the digital text to work. The next part will deal with the application of the hypersemiotic framework to the study of the ISDoc as an example of a genre existing in the digital kairos.

PART 2: ANALYSING ISDOCS

CHAPTER 4. FRAMING THE VARIABLES

The primary goal of this chapter is to provide the *methodology for analysis of ISDoc texts*. To that end, several questions guided the analytical process:

1. What are the characteristics of the rhetorical communities that determine the context of production of ISDocs?
2. How can Rhetorical Genre Studies (RGS) approach the study of emergent genres such as the ISDoc?
3. How can frameworks from different disciplines be integrated in the analysis of the ISDoc genre?

The first question aimed at understanding the conditions in the *kairos* (Miller, 1984) that favour the creation of a community of different stakeholders that participate into the ISDoc genre. To answer it, the first section of the chapter explores how the Massachusetts Institute of Technology Open Documentary Lab (MITODL) defined their IDoc project, thus allowing to map the participants that rhetorically enact and structure the target genre of this thesis.

Based on the status of the ISDoc as an ‘emergent’ genre (Miller, 2016), the second question guides this thesis into the exploration of different approaches that could serve to understand the target genre. Apart from the previous analysis of the rhetorical communities, this chapter delves into the examination of the ‘synergistic combination of features’ (Miller, 2016, p. 15) that favour the emergence of the ISDoc.

In that line, the third question describes the contribution that different disciplines can provide to understand that combination of features. Based on the notion that RGS should ‘make use of all analytical tools’, and drawing from discussion in Chapter 3, this chapter describes the elements of the hypersemiotic framework as adapted to the study of digital genres such as the ISDoc.

4.1. FRAMING THE VARIABLES

4.1.1 The database: the Massachusetts Institute of Technology Open Documentary Lab as rhetorical community

The MIT Open Documentary Lab (MITODL, hereafter) is a project devised by the Massachusetts Institute of Technology. The project, which ‘brings storytellers, technologists, and scholars together’, encompasses a series of practices geared towards the study of new forms of documentary, namely ‘courses, workshops, a fellows program, public lectures, and conferences’. All of these activities and actants account for the ‘Lab’ label in the projects’ name. Within the range of this thesis, these come to be part of the *rhetorical community* (Miller, 1994) that participates of the ISDoc genre; a priori, a *relational* one, in which the project leaders “have real relations with each other [...] and the collective itself has a structure” (p. 73); but also a *taxonomic*, where further participants *virtually* join and participate in the practices that structure the genre. So how does the MITODL rhetorical community articulate both tendencies, and how do the actants participate in its ‘discourse hierarchy’ (Miller, 1994, p. 73)?²⁹

A point of departure could be to consider the MITODL as an *activity system*, in Engeström’s (1999) terminology; thus the ‘Lab’ in MITODL could be understood as a ‘human interaction’ which is ‘ongoing, object-directed, historically conditioned, dialectically structured, and tool-mediated’. Further exploring the structuring of an activity system, it can be observed how its three main components can be parsed through the MITODL structure. Firstly, the *subjects* would correlate to all the aforementioned ‘storytellers, technologists, and scholars’. Secondly, the *objective/motive* would correlate to that of ‘exploring new documentary forms with a particular focus on collaborative, interactive, and immersive storytelling’. In the case of the *mediational means*, which are the ‘material and semiotic tools in use

²⁹ The MIT Open Documentary Lab goes well beyond what is described in this thesis. As a ‘center for documentary research’ (MIT Open Documentary Lab, n.d.), the ‘Lab’ features activities and events with ‘artists, journalists, technologists, and media makers’; it helps develop tools and media for the creation of new IDocs; and is also a dissemination hub for media making. Once again, this thesis may not do justice to the myriad of actions taken over at the Lab, but still encapsulates the main relations established in this kind of rhetorical communities.

that enable subjects to carry out their work', it could be argued that the most prominent tools would include (1) the aforementioned activities and (2) the exploration of the IDoc as the typified form of social action, drawing on Miller's (1984) definition of genre, that binds the different members of this activity system together. Nonetheless, this specific wording and definition could be problematic at several levels, which can be examined when revisiting the semantics of the 'Documentary' label.

In its 'About' section (MIT Open Documentary Lab, n.d.), the MITODL states that the 'Documentary' label comes from the Lab's understanding of the activity as a 'project rather than as a genre bound to a particular medium'. Several terms within this definition are key in unravelling the differences in conceptualising this exploration of the documentary. The first key concept is, of course, that of *genre*. The definition of MITODL is somewhat problematic when compared to Miller's seminal definition, since the former refuse to envision their activity as a 'genre bound to a particular medium': *medium* is the second key concept.

It is understandable that, given new advances in the general state of technology, and the further progress in the making of documentaries, the MITODL refuse to characterise it as a recurrent form of social action. This is not only comprehensible from a technological point of view, but also from the scope of genre theory. In order to better explore this problematic definition of the 'Documentary' label, it would probably be more successful to revisit Miller's (2014) conclusions on the study of another parascientific genre, the blog, that she previously proposed in 2004:

The conclusion we drew from the comparison of the differing contexts, participants, and exigences of the personal and public affairs blogs was that the blog is not a genre but is rather a technological medium that can support multiple genres. (Miller, 2014, p. 64).

The main idea that can be extrapolated to this analysis is that the changes in the *kairos* - that is, the sense in which discourse can seize on the unique opportunity of a 'fleeting moment to create new rhetorical possibility' (Hess, 2011; Miller, 2009)

-, may have unleashed a series of changes in the conception of what a documentary is and how it can be understood. The revision of how early documentaries experienced changes which would potentially enhance its reception by the audiences was carried out in the first two chapters of this thesis. In the case of the MITODL, a similar situation can be drawn with how the Internet may be mediating the evolution of the documentary, given the different techniques and technologies that the project relies on when analysing and producing them. In both cases, it can be observed how the technological advances were and are used to expand the boundaries of the documentary. Nonetheless, do these changes run parallel to a shift in the *kairotic* space in which the documentary takes place?

Once again, Miller's reflections on blogging can be extrapolated to the analysis of the documentary. In her study, Miller concluded that, given the advances in the state technology, recurrent social action ends up being 'always mediated in some way'. However, Miller also stated that this mediation would not be determining, since 'exigence and cultural context all interact with mediation and technological platforms'. In the case of this study, the creation of the aforementioned documentaries was marked by the introduction of new visualisation techniques in the form of CGI, in the case of *Cosmos*, and other technologies and techniques such as virtual reality and other interactive tools facilitated by the medium. However, is there a change in the exigence and cultural context that would make the documentary a medium for the expression of different genres, and not a genre, as the MITODL claims? We could initially hypothesise as follows:

- If it was a *genre*, it would then make sense in Miller's definition of a rhetorical community, since the documentary would be the 'cultural artefact' (p. 69) that would tie the members of the community together.
- If it was a *medium*, it could also be extrapolated as a tool of such force, since, according to Giddens' (1984) structuration theory, structures of this kind are 'both medium and outcome of the social practices it recursively organises; both means and end, both resource and product'. By this concept, which is named 'duality of structure', it can be understood that the structure conformed by the MITODL revolves around the documentary medium not

only as the ‘material resources used in the production of semiotic products and events, including both the tools and the materials used’ (Kress and van Leeuwen, 2001: 21-22; which corresponds to the definition of ‘medium’), but also as the outcome that the structure ends up reproducing. In other words, the documentary medium would not only provide scientists with a clear outcome in the shape of analysing and creating a documentary, but would also shape this reproduction by means of the different tools and materials put in practice.

Furthermore, this relation is critical in the understanding of the final label assigned to the MITODL project, ‘Open’. In its ‘About’ section, the MITODL state:

In the spirit of MIT’s open courseware and open source software movements, the Open Documentary Lab is inclusive, collaborative and committed to sharing knowledge, networks, and tools. Open in its understanding of documentary’s forms and potentials, the Lab is catalyst, partner and guide to the future of reality-based storytelling.

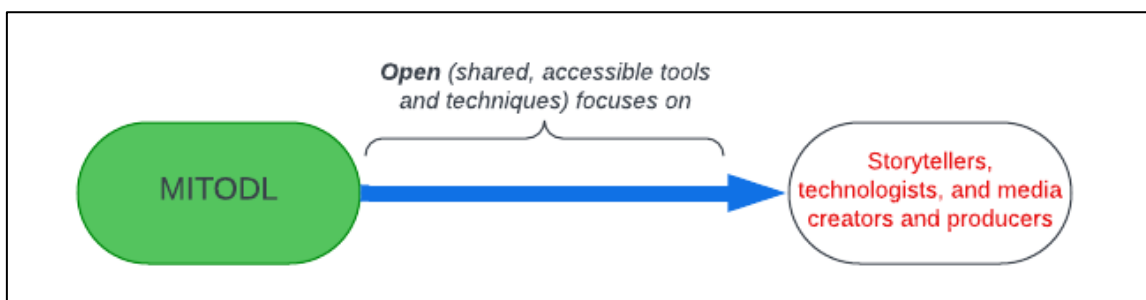
This reflection is important in relation to the discussion about the social exigence and the consideration of the documentary as a medium or as genre (especially in the following sentence: ‘Open in its understanding of documentary’s forms and potentials, [...]’). However, it should also be addressing the issue of the meaning of ‘Open’ from the perspective of what successful scientific communication looks like. In this sense, it appears that MITODL members may be trying to make a significant impact on the production of documentaries by adhering to the Open principles of Open Source Software and Open Courseware. This can be traceable by exploring the interface of both its Main Page ‘Home’, which exhibits the different tools in the shape of courses, events, videos, and other social networking sites that are put to this service; and its Docubase corpus, which features a wide variety of filters in order to catalogue different works, and a ‘Tools’ section which specifies the most widely used instruments in the creation of these documentaries.

It appears that the MITODL may then partly be answering the earlier question of what successful scientific communication looks like: from a perspective of Open

Science and genre theory, the MITODL provides the community members (the *taxonomical* part of the genre) with different, accessible, and shared tools that in turn help instantiate and reproduce the target genre (by bringing audiences, the *relational* part, in the project). Nonetheless, it remains to be seen whether this ‘openness’ on successful scientific communication may not be considering the core Open Science principle of ‘making scientific research and its dissemination accessible to all levels of an inquiring society, amateur or professional’ (Wölfe, Olliaro, & Todd, 2011, p. 745).

Once again, although the different sites and tools employed by the MITODL state its openness, this may be limited to the reach of only the professional users of the database. This is further reinforced by several claims made in the site. For instance, the exploration and production of the documentary is to be carried out by ‘storytellers, technologists, and scholars’; amateur audiences may not be considered in this respect. It then appears that ‘successful scientific communication’ is restricted to a *horizontal* view on the process (Figure 4.1). Moreover, it could be argued that the MITODL focus on techniques and similar tools is a purely technological and artistic one, given its emphasis on communicating advances in the production of documentaries to producers which may not be part of traditional STEM spheres of knowledge.

Figure 4.1
Analysing the ‘Open’ label in MITODL



Note. ‘Open’ focuses on media creators and producers.

The process, although it is restricting at first glance due to its overt focus on providing media creators and producers with tools and techniques that explore the ‘future of reality-based storytelling’, may be *incidentally* widening its extent. The

exploration of techniques is put to the service of exploration of topical niches, that is, themes and issues of any relevance. In other words, the advances in *form* are to be accompanied by advances in *content*. It is the 'Documentary' label, not the 'Open', that better explains the exploration of contents and its engagement to the world and further audiences.

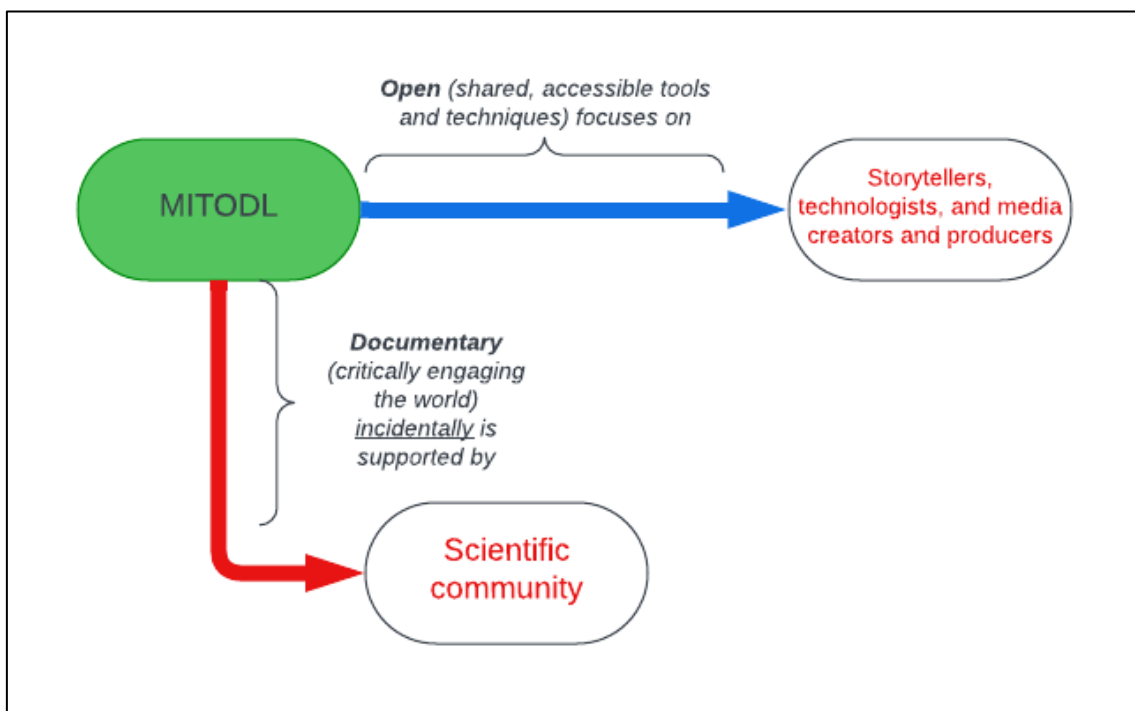
The content, revealed in the MITODL Docubase projects, can be catalogued and filtered according to the topics that the documentaries cover. As the MITODL states in its 'About' section, 'the documentary offers ways of exploring, representing, and critically engaging the world'. Considering that knowledge areas/disciplines of any kind share this ultimate purpose, it may be suitable to think of the documentary as an artifact suitable for the exploration of diverse topics. In the case of 'purely' STEM topics, the statistical analysis of how relevant they are in the MITODL classification may be flawed for two reasons: (1) the wide scope of some of the labels ('South America', 'Media') that do not allow for fine-grained revisions based on semantic classifications, and (2) the consideration of what STEM is, and whether some of the topics covered should not be accountably viable under this label. All in all, approximately 30% of all the labels (80 out of 256) could be accountable for purely STEM topics. Once again, this does not mean that other topics, which could better function under different labels (such as 'Arts and Humanities', for instance) are not susceptible to undergoing similar analysis, something that falls outside the scope of this thesis.

In the case of the scientific documentary, the choice of these topics may correspond to either the media producers' need to target socially relevant issues for purely commercial reasons or to the intrinsic connection between the main technical goals of the MITODL and the topics that can be used in order to fulfil the range of these techniques. As incidental as the relation between form (storytelling through new virtual/technological tools and techniques) and content (STEM topics) may seem, in its intent of providing media creators with new tools and techniques, the MITODL appears to be incidentally relying on the use of commonplace topics, such as STEM, which concerns the scientific community. In other words, despite the fact that the MITODL is not directly addressing the

scientific community, the choice of the topics that promote the application of new techniques incidentally requires the collaboration of the latter in order to provide the necessary ‘critical’ judgement to engage the world (Figure 4.2). The ‘Open’ axis is represented horizontally in order to show the relation existing between the MITODL and the community explicitly targeted in its main goal. By means of the vertical axis, it is possible to represent the incidental nature of the ‘Documentary’ label, permeating towards other communities.

Figure 4.2

Analysing the ‘Documentary’ label in MITODL



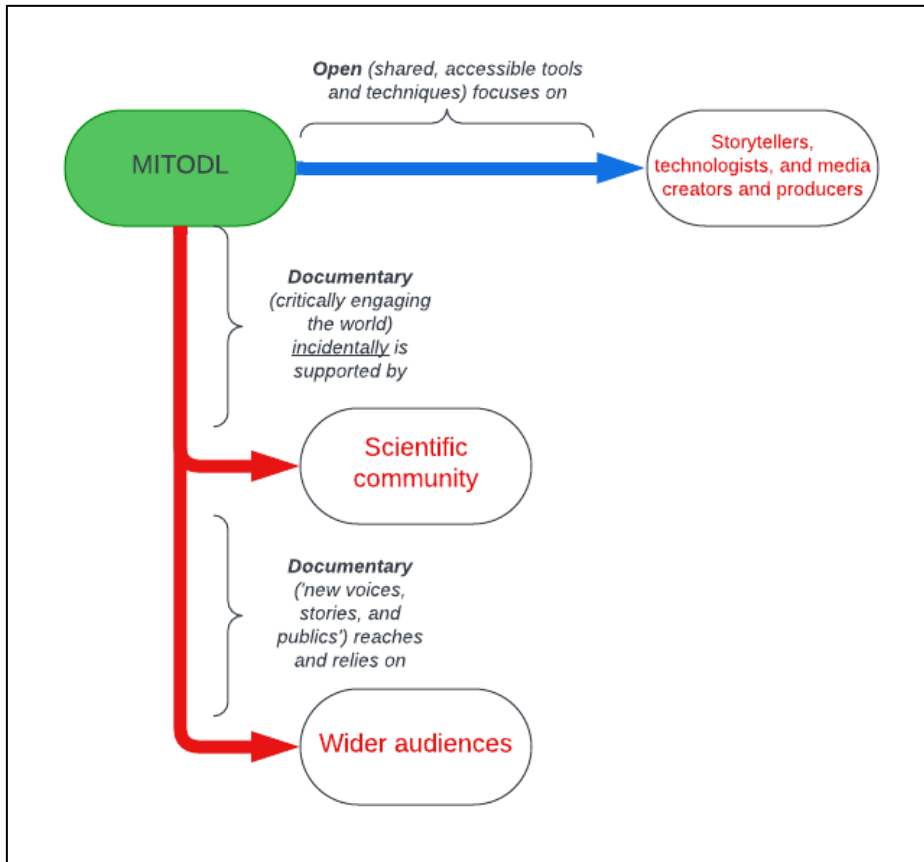
Note. Incidentally supported by scientific community

So far, the relation between MITODL and several communities that participate in the construction or production of the scientific documentary has been established by means of the ‘Open’ and ‘Documentary’ labels. The former refers to the opening and sharing of techniques and tools that allow for the documentary genre to expand, and its directly focused on media producers. The ‘Documentary’ label, on the other hand, has an incidental reach on the scientific community, given that the choice of contents that serve to ‘critically engage the world’ demands their inclusion in order to participate in the genre.

Nonetheless, is the MITODL really a suitable database which can be used as a tool for dissemination of scientific knowledge *to wider audiences*? In other words, can the MITODL scientific documentaries be associated with the Open Science movement in the light of the Open Science principle of ‘making scientific research and its dissemination accessible *to all levels of an inquiring society, amateur or professional*’? It is necessary to reinterpret the ‘Documentary’ label to answer this question affirmatively, and the semantics of ‘Documentary’ needs to be approached from two different points of view: that of the MITODL and that of Skartveit’s (2007) ‘Documentary contract’.

The first clue that allows for this dissemination to happen can be found in the ‘Documentary’ section. The MITODL states that ‘[it] explores the potentials of emerging technologies and techniques to enhance the documentary project *by including new voices, telling new stories and reaching new publics.*’ This claim is not only justifying the projects’ views on reaching wider audiences, but is also interesting from the point of view of genre theory. Relying on Giddens’ structuration theory, it could be inferred that, in the making of the documentary genre, practices serve to reproduce and instantiate the general principles that govern this process. In the same way, this could be extrapolated to the role of the audiences: audiences can be both targeted and employed; it is the product’s final destination, but also the necessary condition to instantiate the genre and push it forward. The word ‘reaches’ in Figure 4.3 could then be complemented by the phrase ‘relies on’, thus maximising the interaction between the members of the community that are joined together in the documentary genre.

Figure 4.3
Analysing the ‘Documentary’ label in MITODL



Note. ‘New voices, stories, and publics’ reaches wider audiences

Secondly, I have already argued that it may be suitable to think of the documentary as a tool which offers sufficient width for the exploration of diverse topics. This exploration, in any case, should be guided by the principle of ‘engaging’ (reusing the same wording used by the MITODL) or ‘taking action’ in the world, as Skartveit claims. Inasmuch as any sort of documentary production is guided by this principle, this thesis is focusing on dissemination of scientific knowledge through collaborative networks. The exploration of a sample documentary found in the MITODL database can serve as a point of departure of this discussion:

Figure 4.4

Interface of MITODL Docubase: sample documentary's synopsis

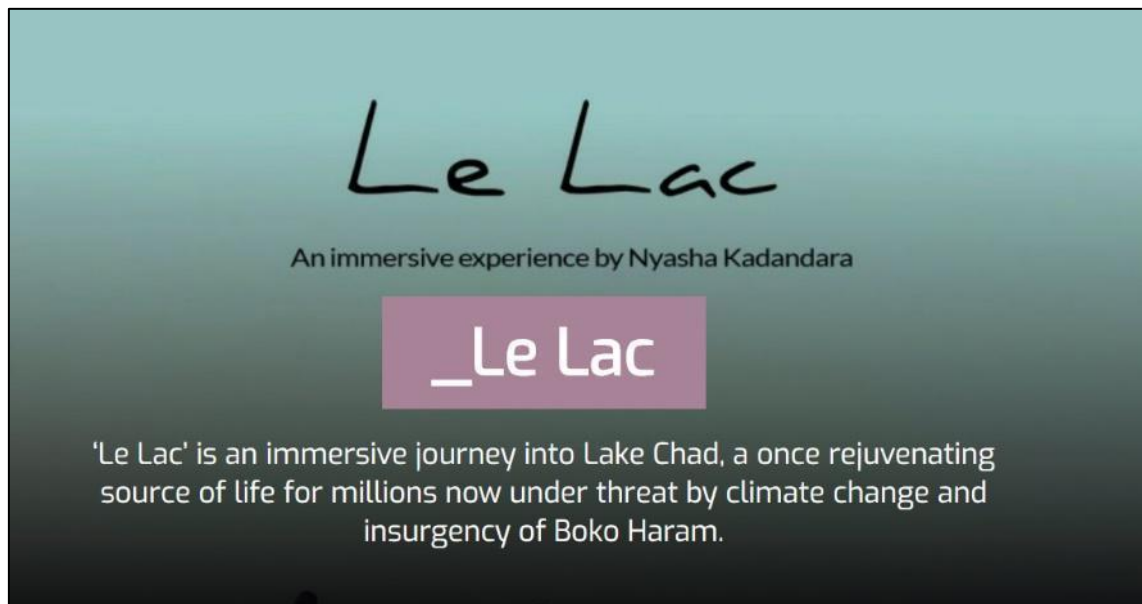


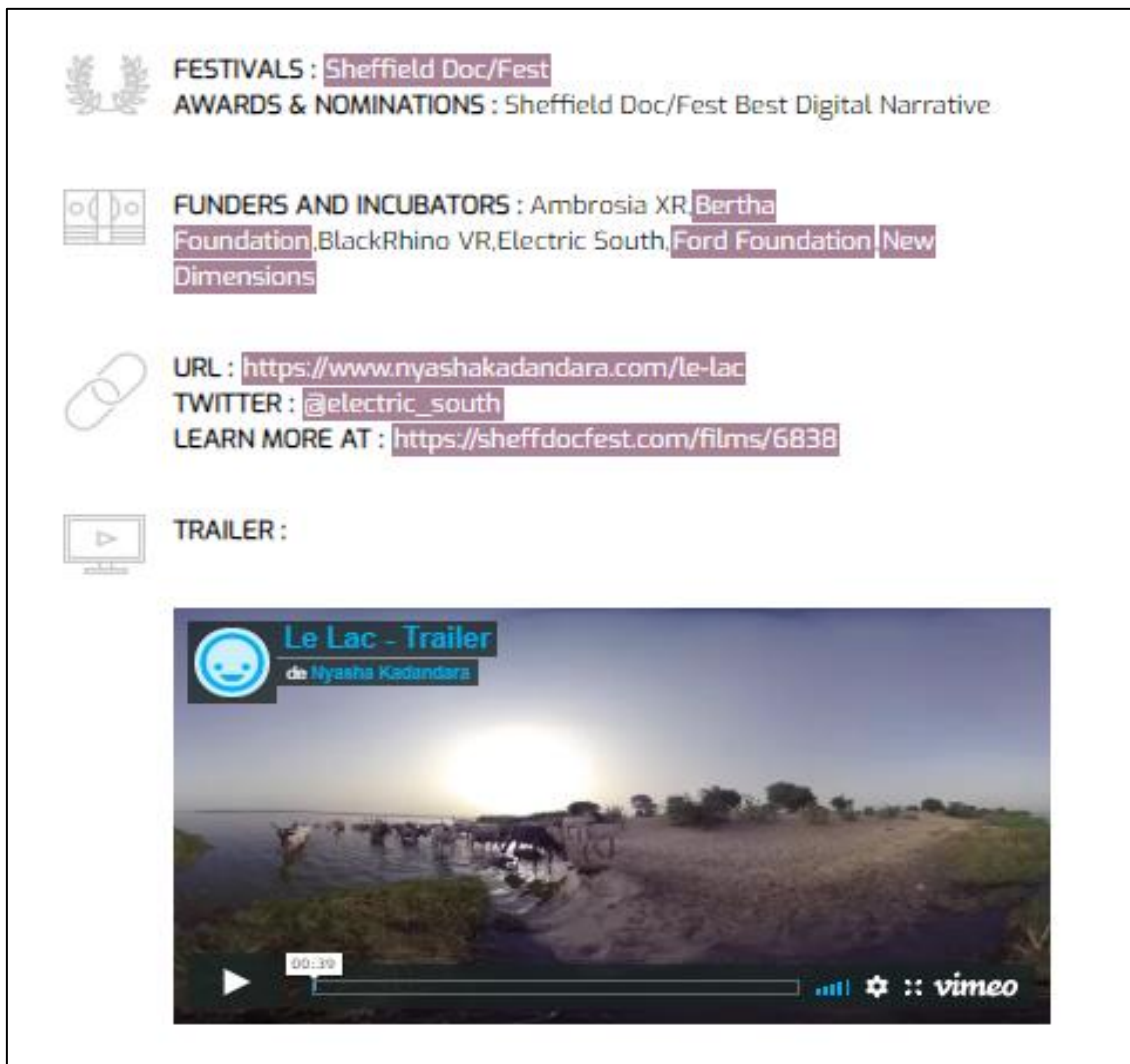
Figure 4.5

Interface of MITODL Docubase: sample documentary's 'Project at a glance'



Figure 4.6

Interface of MITODL Docubase: sample documentary's 'Project at a glance'



At first sight, it can be seen how the MITODL Docubase organises the different documentaries depending on several variables. Given the project's focus on making these documentary innovations to media producers and others, the interface includes different hyperlinks that allow the user to navigate between correlated documentaries depending on the aforementioned variables (highlighted in purple, Figures 4.5 and 4.6). The site expands its social function by including different plug-ins that allow for users to interact between them, leave opinions, or even contribute by correcting or completing the projects (Figure 4.7).

Figure 4.7

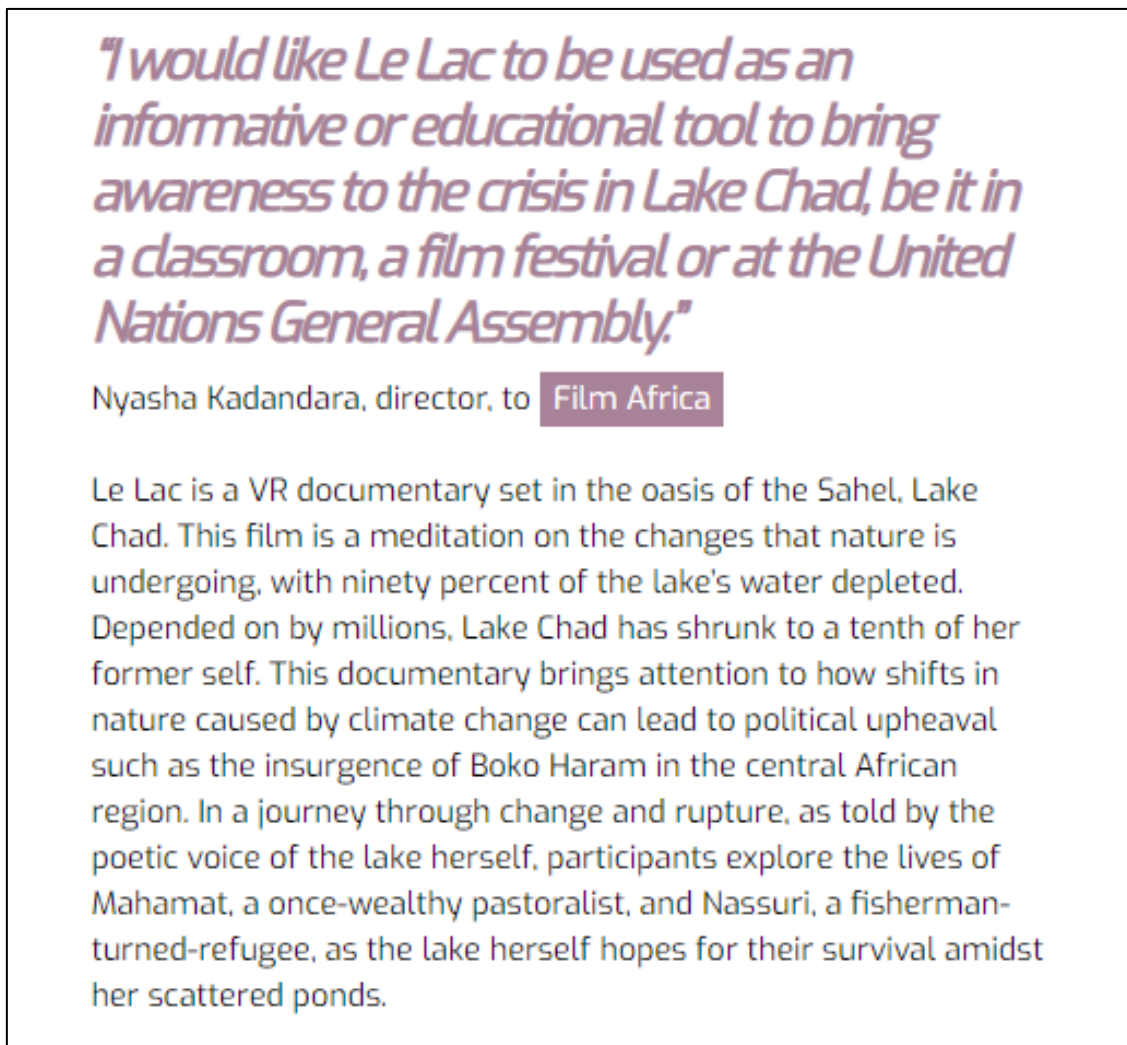
Interface of MITODL Docubase: social networking characteristics



These technical facilities correspond to the 'Open' label in the MITODL acronym. Nonetheless, it is interesting to examine what the authors, directors, and producers say about the documentary project (Figure 4.8).

Figure 4.8

Interface of MITODL Docubase: directors', authors', producers' views on the documentary



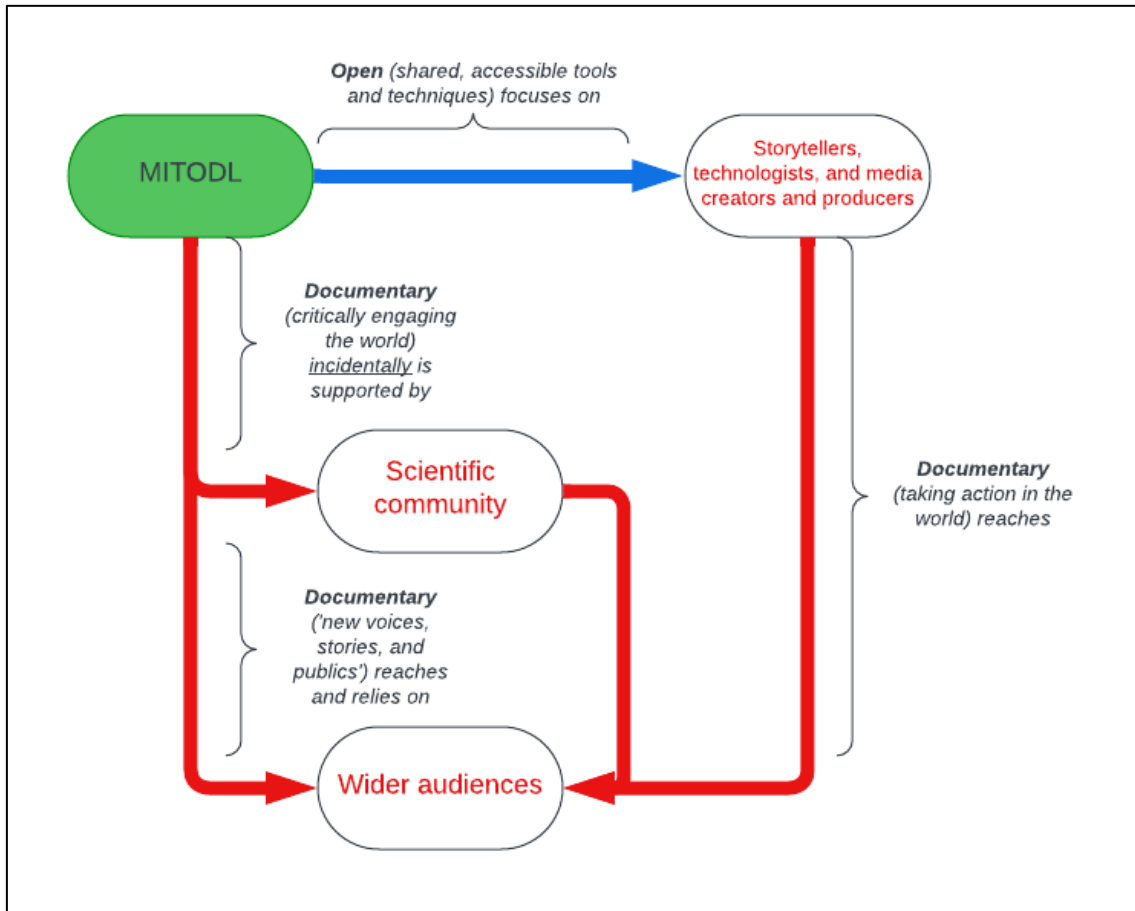
It could be argued that the eventual reach to the aforementioned group of authors could be carried out without the need of the scientific community. This could represent a hindrance to what successful communication looks like, coming back to the earlier claim of whether these documentaries could correspond as such. But, once again, it is necessary to reexamine the Open Science principle of 'making scientific research and its dissemination accessible *to all levels of an inquiring society, amateur or professional*'. Does this dissemination need to be necessarily connected in a direct way from the scientific community, research, and events to these wider audiences, as in the manner of a relational community? The word 'incidental' already proved necessary when discussing the way documentaries

indirectly rely on the scientific community in order to push the boundaries of the genre forward, and it can be of use now again.

In the first place, and quoting the words of Nyasha Kadandara, the author of the documentary under this analysis' interests, the documentary can "be used as an informative or educational tool to bring awareness [...]" (MITODL, n.d.). So, hypothetically, even if the scientific community was not directly involved in the process, the 'Documentary Contract' offers the guidance to media creators of making a genre that fulfils the social exigence of 'taking action in the real world'. As Skartveit claims, the audiences are also necessary in expressing their expectations about and within the site of contention represented by the genre, thus making the relationship between audiences and creators much narrower. As 'incidental' as this relationship may seem when examining the MITODL project at first glance, the documentary genre offers a place in which the social exigence promotes interaction and reach between both actants.

In the second place, it could also be argued whether successful scientific communication can occur without a direct addressing/participation of the scientific community. Kadandara's words can be once again brought to the fore in order to illustrate this situation. This author speaks about the documentary's potential educational function by highlighting its regulated use in the classroom. But is the pedagogical/educational range of functions that the documentary genre can achieve limited by regulated use? Even if Kadandara's goal when making *Le Lac* was not an educational one, could the watching of this documentary potentially enhance audiences' engagement and knowledge of the world, thus fulfilling the social exigence of the documentary genre, and ultimately expanding it?

Figure 4.9
Analysing the ‘Documentary’ label in MITODL



Note. ‘Taking action in the real world’ reaches wider audiences.

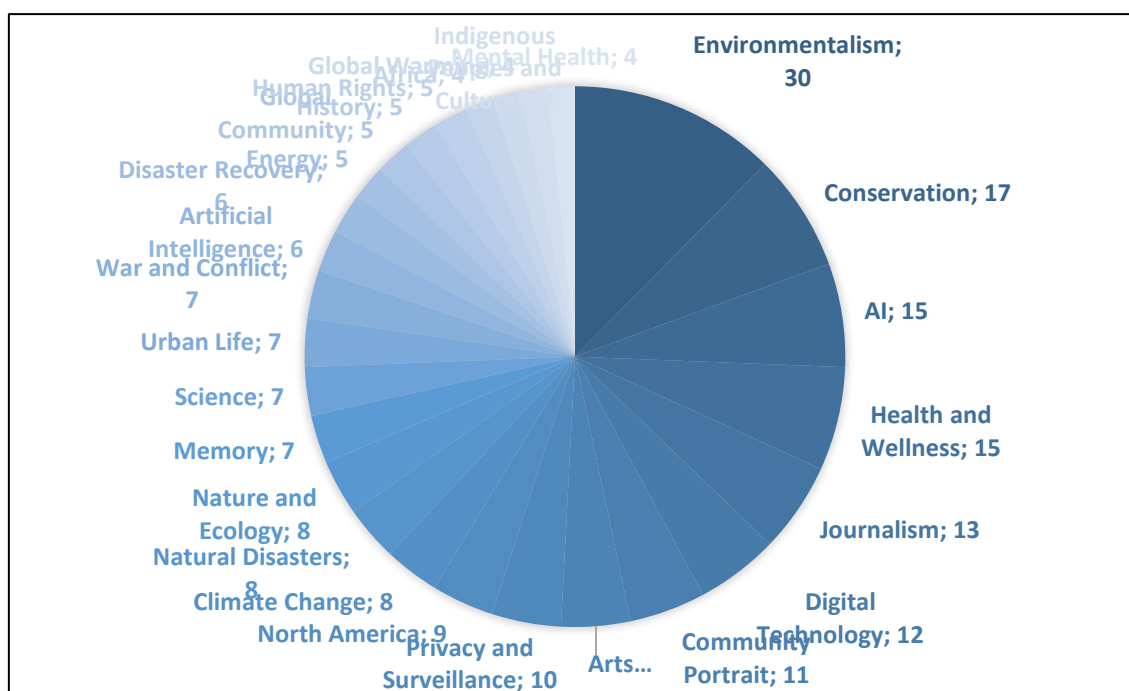
The relationship between all actants can be found in Figure 4.9. For the moment, the MITODL constitutes a valid tool in order to carry out the purposes of this thesis, by proving that the ‘Open Documentary’ (especially the last part) label assigned to the project allows for it to (1) fulfil the social exigence or rhetorical intentions of the documentary genre and (2) to catalogue it as an Open Science genre. It works as a rhetorical community which mostly aims at connecting the documentary authors and practitioners *relationally*, but which *taxonomically* connects further audiences and participants in the genre through the enactment of the Documentary Contract in a *kairos* determined by the Open Science digital context.

4.1.2 Criteria for the selection of ISDocs

After analysing the characteristics of the MITODL as a rhetorical community and its guidelines for the curation of the database, this thesis can now present the criteria involved in the selection of the ISDocs. Access to the complete library of ISDocs is granted through the ‘Projects’ tab. Within it, the ‘Filter’ tab allows users to select several options: language, country, year, topics, technologies, techniques, exhibition venues, and distribution. For the purposes of this thesis, the focus was initially set on projects related with STEM (Science, Technology, Engineering, and Mathematics) topics.

A total of 410 ISDocs are available in the MITODL platform. Based on the platform’s tagging system based on topics, 309 documentaries were discarded as they did not fall within STEM categories. From the 101 STEM documentaries left, 117 different tags were extracted, appearing in 365 instances in the platform’s tagging system. The following graphic (Figure 4.10) contains the most recurrent tags (>1.10% of appearances) assigned to the STEM documentaries:

Figure 4.10
Overview of main tags assigned to STEM ISDocs



As depicted in Figure 4.10, the topics of ‘Environmentalism’ (n=30) and ‘Conservation’ (n=17) were the most recurrent ones among the STEM documentaries. Based on this, the 101 documentaries were further filtered: only those related to the aforementioned topics were considered.

A remark should be done about MITODL’s tagging system: while the system provides a useful classification, there is no consistency in the labelling process. For instance, documentaries which are tagged ‘Disaster Recovery’ are not always labelled with the ‘Environmentalism’ topic, although there is an inherent topical connection between the two. Following this, the selection of documentaries was filtered depending on the ‘Environmentalism’ or topically related tags (‘Conservation’, ‘Climate Change’, ‘Global Warming’, for instance). Moreover, those documentaries which were not accessible at the time of editing were discarded. Reasons include a discontinuation of the technologies used, restrictions on intellectual property, or were not meant for computer use. This rendered a list of 20 potential ISDocs, all ranging between 2011 and 2020 in terms of its year of publication (see Table 4.1).

Table 4.1

ISDocs labelled 'Environmentalism' or topically related tags.

NAME	TOPIC TAGS	YEAR
<i>Bear 71</i>	Conservation, Environmentalism, Privacy and Surveillance	2012
<i>Behind the Dirty Gold (Las rutas del oro)</i>	Environmentalism, Gold Trafficking, Human Rights, Journalism, Latin America, Oral History, Politics, Privacy and Surveillance	2015
<i>Black Gold Boom</i>	Community Portrait, Conservation, Energy, North America	2013, 2015
<i>Climate Witness Project</i>	Climate Change, Conservation, Environmentalism, Global Warming, Journalism, Nature and Ecology	2019
<i>Earth Primer</i>	Education, Geography	2015
<i>Echoes of Tsunami</i>	Asia, Disaster recovery, Natural Disasters, Southeast Asia	2014
<i>Firestorm</i>	Australia and Pacific Islands, Disaster recovery, Family, Natural Disasters	2013
<i>Hypha</i>	Climate Change, Environmentalism, Fungi Kingdom, Nature and Ecology, Science	2020
<i>In the Eyes of the Animal</i>	Arts and Culture, Environmentalism	2015
<i>InfoAmazonia</i>	Environmentalism, Health and Wellness, Indigenous Peoples And Cultures	2013 ongoing
<i>Inside the Haiti Earthquake</i>	Caribbean, Community Portrait, Disaster recovery, Journalism, Natural Disasters, Urban Life	2011
<i>iSeeChange</i>	Conservation, Environmentalism, North America, Rural Life	2012 ongoing
<i>My Africa</i>	Africa, animals, Conservation, Economics, Environmentalism, Global Community, Human Rights, Nature and Ecology, Race	2018
<i>Sandy Storyline</i>	Disaster recovery	2013 ongoing
<i>Songbird VR</i>	Environmentalism, Global Community, History, Journalism, Memory, Nature and Ecology	2018
<i>The Atomic Tree</i>	History, Nature and Ecology, Religion and Spirituality, War and Conflict	2019
<i>The Last Generation</i>	Climate Change, Community Portrait, Conservation, Global Warming	2018
<i>This is Climate Change</i>	Climate Change, Conservation, East Africa, Environmentalism, Global Warming, Human Rights, Indigenous Peoples And Cultures, Journalism, Rainforest	2018
<i>Tidmarsh Farms: Living Observatory</i>	Conservation, Environmentalism, North America	2012
<i>Toxic Trail</i>	Environmentalism, Health and Wellness	2014
<i>Tree</i>	N/A	2017

The last step was to reduce the number of potential documentaries into a representative sample susceptible to being analysed in the case studies. Further filters that were applied included discarding VR ISDocs or ISDocs not meant for computer use (*Earth Primer*, *Hypha*, *Songbird VR*, *Tree*), ISDocs that offered compatibility problems with part of its contents (*Black Gold Boom*, *Echoes of the*

Tsunami, Firestorm, In the Eyes of the Animal, My Africa, Sandy Storyline, The Atomic Tree), which did not allow access to the totality of its contents (*Climate Witness Project, Inside the Haiti Earthquake, iSeeChange, This is Climate Change, Tidmarsh Farms: Living Observatory, Toxic Trail*) or had been subject to similar studies in the field of IDocs (*Bear 71*). This yielded the 3 final ISDocs that would undergo analysis: *Behind the Dirty Gold* (2015), *InfoAmazonia* (2013), and *The Last Generation* (2018).

4.2. FRAMEWORK FOR ANALYSIS OF THE HYPERSEMIOTIC STRUCTURE

The approach to understanding ISDocs from the point of view of genre theory, and, more specifically, Rhetorical Genre Studies, draws on Miller's (2016, p. 16) claim that in order to comprehend 'genre change and innovation [and its derived artifacts, which would be the case of the ISDoc], we need all the analytical tools that we can find'. Consequently, this thesis's framework for the analysis of ISDocs as hypersemiotic structures combines theories from different fields of study, which were first introduced in Chapter 3.

From a broad perspective, the analysis of ISDocs is divided into two major sections: the first one considers the arrangement and nature of the hypermodal cues in the text, while the second considers how this arrangement conforms to the accomplishment of the Documentary Contract's clauses. To better examine these concepts, subdivisions contained within this section will deepen on the main methodological framework from which this thesis draws upon.

4.2.1 Hypersemiotic structure

As discussed in Chapter 3, section 3 within this thesis, ISDoc texts feature an arrangement of multimodal resources which are enhanced by interactivity. These multimodal interactive resources are further arranged into narrative structures (following Koenitz's terminology) which are then sequenced by users at different stages of the playthrough.

To reflect this approach to analysing this process, the section devoted to the hypersemiotic structure of the target ISDoc will be two-pronged. Firstly, the section named *Semiotic modes in interactive contexts* will first consider the semiotic modes which are engaged on the target text, and how the presence of interactivity in the ‘canvas of the medium’ may account for instances of media transformation. Secondly, the *IDN Structure* section will examine the typology of Interactive Sites Signs within the text and, finally, its arrangement into potential narrative products.

4.2.1.1 Semiotic modes in interactive contexts

4.2.1.1.1 Semiotic modes

As Chapter 3 introduced, the framework initially sets its focus on the analysis of Bateman’s (2017) concept of *semiotic mode*. For each of the three strata that form the semiotic mode, Bateman proposes several ‘fundamentals’ to be observed in the cataloguing of the modes. They are adapted and summarised in Table 4.2:

Table 4.2

Relation of semiotic mode strata with Bateman’s fundamental explanation

Semiotic mode strata (Bottom-up)	Fundamental explanation
Material substrate and regularities in form	Any materiality that may be manipulated using digital or physical tools
Systems of alternatives / Expressive resources	Any expressive resources with structural regularities
Discourse semantics	Discourse semantic mechanisms that support the contextual interpretation of expressive resources and their combinations

Note. Adapted from “Triangulating transmediality: A multimodal semiotic framework relating media, modes and genres”, by J.A. Bateman, 2017, *Discourse, Context & Media*, 20, 160-174. Adapted with permission.

In this thesis’s model, contrary to Bateman’s model, the strata will be analysed in a top-down manner. Bateman’s model, although useful in analysing both static and dynamic texts, may not be fully applicable for the purposes of this thesis due to the

great variability of modes and embedded genres that can be traced in digital genres such as the ISDoc.

In that sense, focusing first on the stratum of discourse semantics as the ‘realised form’ of those materialities may ease the task by first attending to the general procedures for meaning-making. Without operating at the same level as genres, this first stratum presupposes that the canvas of the medium for the ISDoc will always be digital, and that the embedded genres work within the overall ISDoc genre as optional realisations of the text. Thus, analysing the semiotic modes through the ‘discourse semantics’ stratum will imply looking for (1) the realisation of semiotic modes within the text and (2) the realisation of semiotic modes within embedded genres within the text. For instance, an ISDoc with no embedded genres will first catalogue the ‘discourse semantics’ of a semiotic mode such as ‘spoken narration’ and provide a contextual interpretation for its appearance. In ISDocs with an embedded genre of, for instance, data visualisation, the ‘discourse semantics’ will be contextually interpreted within the genre and the further strata subdivided depending on the expressive resources and material substrates employed.

For the purposes of this thesis, the concept of *embedded genre* will be used to designate the semiotic mode(s) which (1) have an independent and functional existence outside the ISDoc genre, (2) within the text, act in accordance with the ISDoc genre’s social action and the text’s overall communicative purpose, and (3) convey the use of one or various semiotic modes and/or materialities which, in combination, fulfil a purpose³⁰ on their own. For instance, data visualisations (1) do have an independent and functional existence outside the ISDoc genre (in other journalistic forms); (2) may contribute to the ISDoc’s Documentary Contract clause of ‘Truth’ by providing graphical representation of data and its evolution over time at a pace marked by the user; and (3) combine different visual

³⁰ The concept of ‘purpose’ should not be understood as related Halliday’s metafunctions (which will be analysed in the following sections), but rather as the role that the embedded genre is able to play *both* in the text and independently.

materialities (text labels, dynamic bars and graphics...) which, together, are able to provide more accurate and intuitive data visualisations.

Moreover, this thesis includes an additional level of analysis which concerns the possibility of *meaningful interactivity* with the semiotic mode(s). By *meaningful interactivity* this thesis refers to those instances where users' input allows a sense of 'agency' and 'authorship' within the experience (Svanaes, 2000). In that sense, the concept of 'interactivity' is highlighted as a contrast to 'interaction' (see Chapter 3, section 3.2.1), and includes instances with a low degree of authorship such as starting and pausing a video, or scrolling through the contents. Any paradigmatic realisation (in Bateman's terms) or interactivity with dynamic modes will be accountable for positive interactivity.

Finally, the second and third strata or level of analysis will be analysed in combination. This will first consider (1) whether the perceptible materialities of the first strata are of an audio and/or visual nature, (2) any salient features of the mode (for instance, whether it is static or dynamic), and (3) the way in which they conform to a regular pattern within the text, taking into account the syntagmatic or paradigmatic possibilities for interaction that they enable. The classification, labelling, and explanation of these salient features in the expressive resources and material substrate will be dependent on the technologies engaged in the production of the specific ISDoc text and thus registering variability across different texts.

Table 4.3
Classification of semiotic modes in interactive contexts within the hypersemiotic framework.

Semiotic mode	Embedded genre	Interactivity	Expressive resources and material substrate
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Table 4.3 will summarise the main points for posterior analysis. Overall, this approach to the semiotic modes included in interactive contexts sets the foundations and allows for further analysis of the transmediation of these semiotic

modes, their arrangement within the narrative, and how interactivity is acted upon them in order to fulfil certain functions.

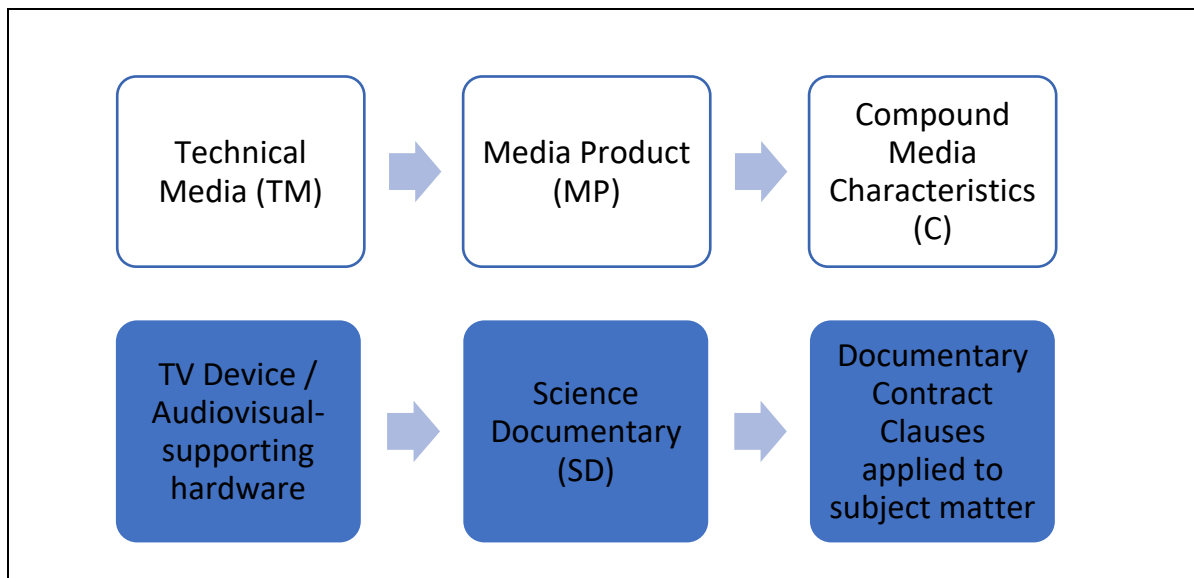
4.2.1.1.2.- Transmediated media characteristics

Once the analysis of the semiotic modes is performed, the framework will consider how the digital affordances of the platform medially transform semiotic modes following Elleström's (2014, 2017) approach.

In a simplified version of Elleström's approach, media transformations occur from a *source medium* into a *target medium*. Furthermore, the process of characterising a medium involves considering three key aspects that were explored in Chapter 3: Technical Media (the material support), Media Products (genres and meta-genres) and Compound Media Characteristics (the contextual interpretations of the Media Products). Under that scope, and to set the foundations for the analysis of ISDocs, the source medium that will be taken into account will be the Science Documentary, characterised (following Elleström's 2014 model scheme) in the following diagram (Figure 4.11):

Figure 4.11

Media characterisation of the SD according to Elleström's approach



Considering the SD as the source medium, its corresponding labels feature the sub-index '1' when the transmediation process is analysed in comparison to a target medium (in this case, the ISDoc, with sub-index '2').

Table 4.4 will be used in the analysis of the transmediated media characteristics of the hypersemiotic framework:

Table 4.4
Classification of Compound Media Characteristics of the hypersemiotic framework

Semiotic (Media Characteristics)	modes	Transmediation Media representation / Emerging	Role of interactivity in media transformation
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The first column will contain the Compound Media Characteristics (C_2) as realised by specific semiotic modes. This model takes into account several assumptions. First, that the Technical Media (TM) that characterise the ISDoc is the digital environment, with its possibilities for hyperlinking, multi(hyper)modality, and the emerging trait of interactivity (see Chapter 3, section 3.3.1 for a characterisation of the digital medium). Second, that the Media Product (MP) as the “particular activity or artefact carried materially by Technical Media” (Elleström, 2017, p. 5) under study is the ISDoc. Third, that the Compound Media Characteristics (C) can be equated, to a greater or lesser degree, to the classification of semiotic modes and embedded genres carried out in the previous section.

This second column will contain the analysis of whether the process corresponds to instances of transmediation, media representation., or emerging trait. It must be noted that the framework leaves out the notions of *mediation* and *representation*³¹, as this thesis considers that the ISDoc's canvas of the medium inherently allows these processes to occur without the need to detail them. The concept of 'emerging' trait, extracted from Miller (2016), implies the presence of a

³¹ “Mediation captures the relationship of material instantiation that holds between technical media and media products: i.e., technical media mediate media products [...] The relation of representation then covers the relationship that holds between media products and the media characteristics that they carry” (Elleström, 2017, p. 5).

semiotic mode which participates from the digital medium and could not do so in the Technical Media of the SD³².

Finally, the third column will consider the affordances or extension of resources available to the genre after the media transformation within an interactive environment. As explained in Chapter 3, ‘interactivity’ (as opposed to ‘interaction’) assumes that, apart from the action-reaction dynamics established between users and digital systems, there is a level of *agency* that affects users’ construction of the text. This section of the analysis considers how interactivity helps providing a structured and responsive interface for users to navigate and access the ISDoc’s contents in a more or less autonomous manner (that is, a seamless *interaction*); however, it also addresses how, in the interactive structure, the discourse semantics of the ISDoc are transformed from their virtual source genre and allow for the arrangement of contents in a way that they fulfil the Documentary Contract. In all, this section of the analysis will take into consideration the structural and communicative affordances of the inclusion of interactivity into the targeted ISDoc.

4.2.1.2 IDN structure

4.2.1.2.1- Interactive Sites/Signs

The analysis of the structural properties of the text will begin by considering the systematicity of the interactive affordances. This thesis replicates Adami’s (2013) framework in that it analyses how Halliday’s (1978) metafunctions (and the added ‘interactive value’) are mapped onto the paradigmatic and syntagmatic possibilities for the realisation of interactivity.

A first approach to the classification of ISS within the text will take into account the variety of *forms*, *actions*, and *effects* involved, with a main focus on the former and latter³³. This analysis will then consider the *ideational* level of ISS located in

³² If the semiotic mode is ‘emerging’ in other digital genres and can be traced before the emergence in the ISDoc, the semiotic mode will still be classified as ‘emergent’, providing that the section analyses the media transformation from the matrix SD genre.

³³ This thesis cannot provide an analysis of the impact of different interactive actions on users’ perceived interactivity, which would require separate data collection instruments.

the text, classifying them in wider groups by highlighting their *formal* aspect before briefly specifying their *actions* and *effects*. A clarification must be established at this point which concerns the consideration of ISS being syntagmatic or paradigmatic in the ideational level. This thesis considers that the ideational syntagmatic realisation of the ISS is their presentation within the layout as they appear without user interaction; their paradigmatic realisation implies any kind of interaction. This serves to clarify the difference with the meaning of paradigmatic-syntagmatic realisations in previous and following sections of this analysis. Second, in the *interpersonal* level, this analysis will focus on the ISS that address users, authors, or others upon interaction. In the *textual* level, the analysis explores the coherence and regularity in the relation between Given and New information; that is, questioning whether the arrangement of ISS within the layout at a syntagmatic level, upon interaction, regularly leads to expected ‘new’ information. Discussion on the interactive value of the ISS will be inherently tackled through the analysis of the Interactive Digital Narrative design in the next section so as to devise how these ISS structure and are structured in the narrative system.

4.2.1.2.2- Interactive Digital Narrative design

Koenitz’s (2023) SPP model for IDNs will provide the basis for the analysis of the ISDoc text’s interactive structure. At this stage of the analysis, this thesis will focus exclusively on the text as a *process*, thus aiming at understanding the sequential engagement that users can provide to the overall elements of the IDN system. In that sense, specific parts of the text will be selected in order to avoid redundancy or unnecessary loops in the arrangement of lexias.

Additionally, the specific element from Koenitz’s framework which will be under analysis in this section is the text’s *narrative design*, or ‘the procedural logic applied in an IDN, and how the elements are exposed through a UI to enable a participatory process’ (Koenitz, 2023, p. 78). For how this section is structured, this focus on narrative design implies that, analysing the text’s narrative design will involve pinpointing several textual elements (including the extrapolation of concepts at lower levels of analysis, such as Koenitz’s assets and Bateman’s semiotic modes) and their integration into the wider interactive structure.

First, an overview of the narrative sections or chapters will be provided along with a potential instantiation / playthrough. This implies that, if possible, and/or if the author designed the overall structure in such a way, an arrangement of wider groups of lexias will be provided. A clarification should be established at this point. Departing from Koenitz's fundamental definition of the SPP model, analysing a 'narrative structure' should not only consider the discourse, plot, or arrangement (the 'how') of the narrative that is granted a priori by creators, but also how its story or contents (the 'what') determine users' path through the narrative. In other words, and critically for the latter concept: IDNs owe its narrative design to its authorial layout as much as they do for users' engagement and interaction with it.

Following this, and to guide the aforementioned first step for analysis, the revision of the *process* of the narrative will be viewed through two *relations*. On the one hand, the *textual* relation will imply examining how lexias, as individual fragments of the modular text, establish wider navigational connections that are supported by the interactive possibilities described in the previous section. On the other, the *ideational* relation will involve the examination of the topical and thematic connection between these lexias. This two-pronged approach allows to cater for the variability of arrangements that ISDocs exhibit, thus covering the hypersemiotic pathing of texts that range from minimally interactive texts with clearly defined paths to highly modular instances.

Second, the lexias will be classified depending on their syntagmatic or paradigmatic location in the text. Syntagmatic lexias (orange) will be those that are accessed with or without specific interactive actions and are located within the text's 'main path'. Paradigmatic lexias (green) will be accessed through specific interactive actions, and expand the text's main path with complementary material. Lexias will be assigned a label based on the main semiotic mode they enact, the defining ISS that allows navigation through the text, or the label that they adopt in the text.

Finally, the scheme will represent the *links* between syntagmatic and paradigmatic lexias and the changes that interaction triggers on the text's layout, that is, whether

interaction accesses built-in lexias within the overall layout, changes it, or redirects towards material outside the platform.

4.2.2 Scientific contents and legitimization of social action

This section draws on discussion established in Chapters 1 and 2 about the relation of Documentary with Genre and Science, respectively. The concept that underpins this analysis is that of *social action* (Miller, 1984) as the ‘typified rhetorical actions based on recurrent situations’ (p. 31). As discussed in section 1.3.1 in Chapter 1, Skartveit’s (2007) ‘Documentary Contract’ provides the ‘regular discourse practices’ of the documentary community that can be equated to those typified rhetorical actions.

The specificity of the scientific focus for ISDocs indicates that the Documentary Contract needs to be further aligned with the interests of scientific communication. In Chapter 2, it was argued that forms of science dissemination that have arisen as a result of Web 2.0 affordances have led to a distinction between ‘academic and vernacular’ genres (Burgess & Green, 2009). The latter include instances of ‘erosion’ of traditional scientific discourse practices in favour of non-expert discourse, which grant them the label of ‘para-scientific genres’ (Kaplan & Radin, 2011). Parascientific genres (and thus, ISDocs) are under scrutiny concerning the validity of their scientific claims, Kelly (2014, p.123): how much the creators of these genres, or citizen scientists, truly are scientists? In the same fashion as Kelly argues, this thesis posits that the position of ISDocs in the hybridisation crucible of journalism, science, and grassroots movements can provide valuable insights about the nature of science communication in texts that reflect the changing nature of digital genres. To that end, this thesis will use the concept of ‘legitimation’ of social action (drawing on Van Leeuwen’s 2008 concept) to understand the rhetorical actions that typify the ISDoc genre and that help construct the claims to validity that lie at core of the Documentary Contract 2.0, drawing on the accomplishment of its clauses.

4.2.2.1 Documentary Contract Clause 1: Truth and Reality

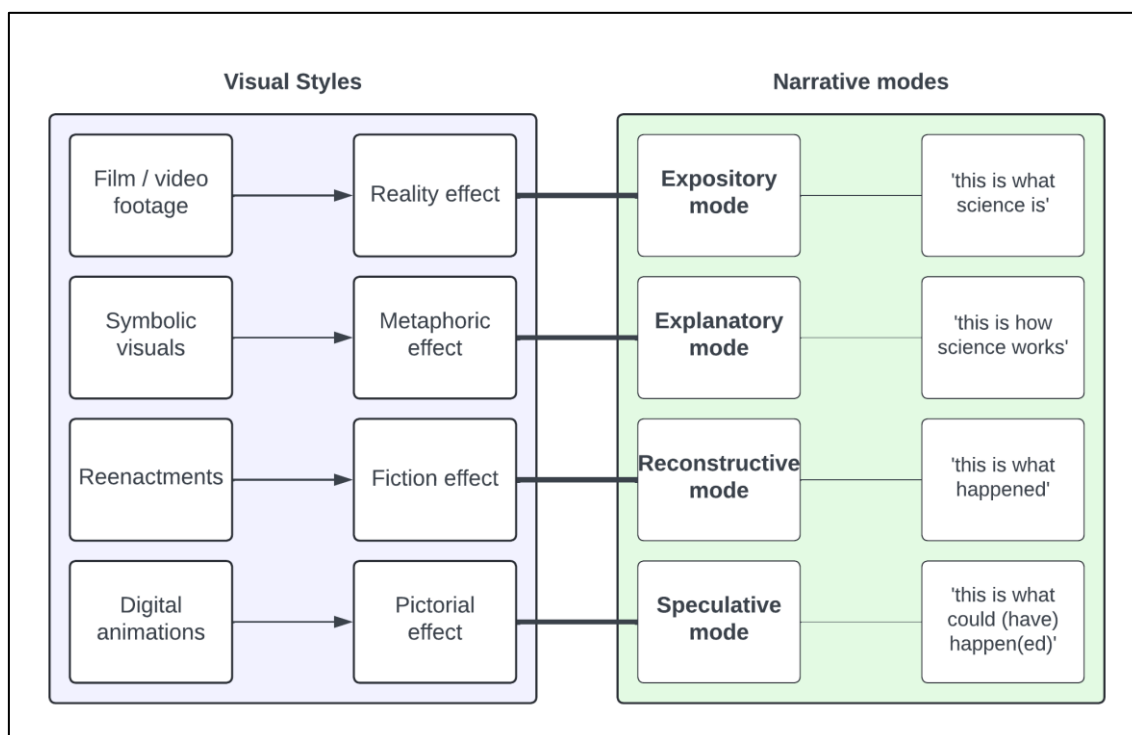
The first clause in the Documentary Contract addresses how objectivity (or the illusion of it) is perceived in documentary texts. Chapter 1 problematised the concept by bringing to the fore issues linked to the historical context of production techniques, the expectations that are assumed a priori, the multiplicity of audiences, the cultural implications of the ‘documentary’ status and so on. All these limitations are transferred to the epistemological examination of the ISDoc’s claims.

For ISDocs, these claims are amplified by the combination of ‘the inherent unruliness of science with the laws of *visualisation* [own emphasis] enforced by a medium primarily valued for its ability to entertain a large audience with moving images’ as Van Dijck states (2006, p. 7). To explain how the Science Documentary genre reconciles both issues, Van Dijck’s (2006) theory of the visual styles and narrative modes provides a classification of how newer technologies of visualisation enable, rather than ‘the illustration of science with images’, the illusion of truth and objective science through the construction of specific discursive actions that allow for a variety of claims and a ‘retooling of the imagination’ (p. 20).

While referring to the context of production of Science Documentary, Van Dijck’s framework is applicable to that of the ISDoc, as depicted in Figure 4.12:

Figure 4.12

Science documentary's visual styles and narrative modes



Note. Adapted from “Picturizing science: The science documentary as multimedia spectacle”, by J. Van Dijck, 2006, in *International Journal of Cultural Studies*, 9(1), 5-24. (permission to be reproduced granted by Sage, see <https://s100.copyright.com/AppDispatchServlet#formTop>)

For the purposes of this thesis, the framework will not use the ‘visual styles’ axis, since the visual resources exposed in the original framework do not cater for the variety of multimodal cues that can be found in ISDoc texts. More than that, the description of visual styles (as anchored on the specific context of production of the science documentary) may not be sufficient to capture the great variability of ways in constructing science online, given the hybrid nature of new digital genres and narrative designs present for the ISDoc.

On the part of the ‘narrative modes’, their definition and the rhetorical action that they enact is still valid for this thesis’s purposes. While still considering the aforementioned limitation about hybridity of genres and discourses, the analysis carried out in this section will contextualise the modes’ rhetorical actions through the specific resources that allow for the construction of scientific discourse. To do so, this thesis will relate (1) the text’s semiotic modes with (2) the narrative mode

or combination of modes that is enacted, considering the role these modes play within the narrative design and the discourse semantics they engage and elicit on the part of users.

4.2.2.2 Documentary Contract Clause 2: Taking action and Edifying actively

As Chapter 1 introduced, the realisation of the second clause of the Documentary Contract implies that audiences adopt an active role by which documentary contents and subject matter, rather than be presented as categorical truths, need to be decoded and interpreted. When transmediated in the digital genre of the ISDoc, the legitimisation of such clause is *pragmatically* enacted on the documentary's contents themselves: the rhetorical actions that typify the genre, and thus its social action, are constructed through the interactive affordances in which the ISDoc are anchored.

All the previous sections in the analysis coalesce in the latter and provide viewpoints and insights on how the examined text makes use of interactivity to accomplish the Documentary Contract clauses. Discussion on semiotic modes in interactive contexts brings forward the functions that users can enact on the text and grant them control to an extent over the contents of the documentary; the IDN structure informs about the structuration of ISS and its arrangement and scaffolding through the narrative design so as to proportionate different degrees of access to scientific contents; and ultimately allows to analyse the degrees of overall user control, navigation, and sequencing over the predefined paths, or the possibility for widening the platform's contents through direct user participation. Finally, and drawing on Koenitz's concept of the 'triple hermeneutic' of IDNs (2024, p. 80), this section addresses whether the ISDoc offers hypersemiotic opportunities for further revision of the past instantiated narrative, the opportunities for interaction, and the opportunities for newer traversals on the platform.

4.3. SUMMARY OF THE FRAMEWORK: THEORETICAL CORRESPONDENCES AND ADAPTATION INTO THE HYPERSEMIOTIC FRAMEWORK

Table 4.5 summarises the relationship between the sections of the framework, the anchoring frameworks that support them, and its adaptations upon revision of the cases studies:

Table 4.5

Summary of the hypersemiotic framework for ISDoc analysis

Section	Framework of reference	Key Takeaways
1. Hypersemiotic structure		
1.1 Semiotic modes in interactive contexts		
1.1.1 Semiotic modes	Bateman (2017): semiotic modes	<ul style="list-style-type: none"> - Description of multimodal resources engaged at different levels of materiality and discourse, triangulated with the communicative purpose of the genre.
1.1.2 Media transformation	Elleström (2017): media transformations	<ul style="list-style-type: none"> - Explanation of elements involved in media transformation from source to target medium. - Contextualised to include interactive affordances of the ISDoc
1.2 IDN design		
1.2.1 Interactive Sites/Signs	Adami (2013): ISS	<ul style="list-style-type: none"> - Based on Halliday's (1978) metafunctions. - Classification of the functions that are pragmatically enacted in a website through its interactive possibilities.

1.2.2 IDN design	Koenitz (2023): Interactive Digital Narratives	<ul style="list-style-type: none"> - Categorisation of elements involved in interactive structures. - Focus on <i>narrative design</i>.
2. Scientific contents and legitimization of social action		
2. Scientific contents and legitimization of social action	Miller (1984): Genre as social action	<ul style="list-style-type: none"> - Description of conditions that enable rhetorical actions to become typified and describe genres.
2.1 Documentary Clause 1: 'Truth'	Van Dijck (2007): Visual styles and narrative modes	<ul style="list-style-type: none"> - Classification of discursive structures in science documentary. - Visual styles axis removed.
2.2 Documentary Clause 2: 'Action'	N/A	N/A

CHAPTER 5. CASE STUDIES

CASE STUDY 1: THE LAST GENERATION

C1.1. HYPERSEMIOTIC STRUCTURE

C1.1.1. Semiotic modes in interactive contexts

C1.1.1.1.- Semiotic modes

As defined in Chapter 3 (3.1.1), semiotic modes are a ‘doubly stratified configuration of semiotic resources together with the materialities that those resources engage’ (Bateman, 2017, p. 8). These semiotic resources are configured in terms of a process involving (1) the interpretative operations (the *discourse*) that decode (2) the *materialities* (or *material substrate*; Bateman, 2011, p. 19), that is, the physical and perceptible cues in the text.

The semiotic modes that articulate *The Last Generation* as a text enacting the ISDoc genre are presented in the following table. As established in Chapter 4, the name of the semiotic modes will be based on the ‘realised form’ of the materialities and semiotic resources, that is, the *discourse semantics* of the semiotic mode:

Table C. 1.1
Semiotic modes in The Last Generation

Semiotic mode	Embedded genre	Interactivity	Expressive resources and material substrate
Audiovisual / cinematic presentation / narration	No	Yes	<ul style="list-style-type: none">• Video, allows syntagmatic interaction on reproduction (pause/play), cuts and scenes• Written text (narration), optional, no interaction• Written text (captions), optional, no interaction, associated with [Spoken narration]• Spoken narration, optional, static reproduction.• Music, background
Cartography	Yes	Variable	<ul style="list-style-type: none">• Present in interactive and non-interactive form.• Written text (labels) abandon salient shape

			<ul style="list-style-type: none"> • Static images (maps, representations of territories), dynamic transition (syntagmatic interactivity) • Music, background
Data visualisation	Yes	Variable	<ul style="list-style-type: none"> • Present in interactive and non-interactive form • Written text (labels) abandon salient shape • Static images (chronogram, graphics), dynamic transition (syntagmatic interactivity) • Background images or video • Music, background (optional)
Photographic evidence	Yes	No	<ul style="list-style-type: none"> • Written text (narration) • Written text (captions) • Background still images • Music, background
Written evidence	No	No	<ul style="list-style-type: none"> • Written text (salient form from narration and captions), longer excerpts, different formats • Music, background

The Last Generation contains 5 semiotic modes. The most recurring mode is that of the audiovisual narration, which is based on the regular combination of video and narration in either written or spoken form. The co-occurrence of both written and spoken narration is scarce (only one instance was found in the text), and was not considered to be relevant enough in terms of its lack of regularity across the text. In Bateman's (2017) framework, the kind of materialities engaged in video sequences are usually recorded interviewees' testimonies or other character's actions, but they could also feature drawings (one instance in the text) which keep iconic relations to the events they depict.

Video sequences are interactive in that they allow the user to play, pause, and replay narration at their own pace, but do not include the possibility of direct manipulation of contents (such as selection of shots) on the part of users. The exceptions to this kind of syntagmatic interactivity will be developed in the section concerning the narrative structure of the text. Written text associated with narration is regularly presented in black boxes, and they usually contain short

utterances. Although the form of interactivity they allow in the scrolling is syntagmatic, they sometimes include, within the boxes, possibilities for paradigmatic interaction which will be developed in further sections. In contrast, spoken narration is not restricted to short utterances, since it features the interviewees and other characters' testimonies or recorded behaviours, nor does it include possibilities for interactivity. This form of narration is usually associated with the appearance of written text in the form of captions.

The second semiotic mode in *The Last Generation* corresponds to cartographic maps. The instances corresponding to non-interactive cartography appear for each of the three interviewees representing their birthplaces. In these instances, the written text combines its salient shape in black boxes with its integration within the maps labelling specific places. Images are static. Two instances of interactive cartography are located in the text, corresponding to the first and second chapters. Interactivity in the semiotic mode is syntagmatic in that users can only advance or move back in the narrative, without the possibility of interacting with the geographical markers. Transition between images is dynamic, starting from the vision of the Earth and zooming in the specific places.

The second instance of interactive cartography is relevant in that it presents features of another semiotic mode found in the text: interactive data visualisations. While representing the specific locations in which nuclear tests were carried out in the island, the scrolling action merges with an interactive data visualisation mode which allows for users to compare the magnitude of explosions in the island with Hiroshima's nuclear bomb.

Data visualisations, the third semiotic mode, are found in both interactive and non-interactive instances within *The Last Generation* conveying factual, evidentiary, scientific information that supports the interviewee's narrative. The materialities between semiotic modes are also similar: written text loses its salient shape and is ancillary to the data visualisation, and static images advance through syntagmatic interaction and transition dynamically. Nonetheless, the instances are different in the visual input they present. The first interactive instance (second chapter) presents the overlapping timeline of the nuclear explosions over the

interactive cartography, featuring dynamic transitions between the dots that represent the tests. The second interactive instance (second chapter) presents written text in the form of labels, but also presents the black box featured in the audiovisual narration (which, in this case, substitutes spoken narration). The overall layout of bars across a horizontal axis comparing different sets of data trigger users' interpretation of the ensemble as a dynamic graph. The third interactive instance (third chapter) features a 'completion bar' (representing the expected timespan for the island before suffering major floods) which diminishes upon syntagmatic interaction. Apart from dynamic transitions, this instance features cut scenes in which written text is embedded in black boxes which cover the full layout. Finally, the non-interactive instance of data visualisation (third chapter) presents static images (area graph) and written text (labels) combining both its salient and its design-integrated forms.

In short, these interactive data visualisations constitute an example of an embedded genre type within the ISDoc, since they cover the three conditions: they exist outside the ISDoc, fulfil the 'Truth' clause of Documentary by providing users with factual data, and enact similar social actions in both the ISDoc and as an independent genre.

'Photography' corresponds to the fourth semiotic mode that makes up this text. The predominant materiality, obviously, is the visual input of the photographs, which are used to present factual evidence for the narration. The written text that accompanies this semiotic mode appears in its salient form (black box), but also in the captions below the photograph with other colour and size properties. The photographs do not allow interactivity per se, that is, users cannot modify the content of the web through specific commands located in the photographs. Rather, in order to scroll through the photographs (syntagmatic interactivity), the users can make use of a black box with arrows that encourage the scrolling. In terms of the iconicity in the representation of the photographs, the white border that frames them reminds them of analogue photographs and their developing. As such, this incidental recognition of photography as virtual artefacts (acknowledging its evolution and history) implies its status as an embedded genre;

one with multiple purposes outside the ISDoc genre, but fulfilling in the text the ‘Truth’ Documentary clause.

Finally, the last semiotic mode concerns the use of written texts which differ from those included in audiovisual narration in terms of format. In this sense, the typical salient representation of the black box is maintained for quotes (in a turn towards subjectivity, as explained later) from different characters that do not appear in the ISDoc. Nonetheless, the longer written excerpts feature a different format of plain black text over quasi-white background. These texts do not allow for any interactivity other than scrolling through the page layout. The overall formatting of the semiotic mode alludes to the most basic layout of webpages in simple HTML cod. Through the optics of Bateman’s (2011, p. 20) theory, such material substrate cannot be said to be a sufficiently ‘semiotically charged organisation of material that can be employed for sign-construction’ that is foundational to a digital genre: the engaged materialities do not allow for an interpretative, discursive, meaning-making operation to take place without the triangulation of the genre. In all, and although the mode may replicate certain conventions and formatting of journalistic genres, their overall layout does not enable user recognition and ascription to any specific social action / communicative purpose in which the media traits play a distinctive role.

C1.1.1.2.- Media transformation of the ISDoc’s Media Characteristics

This section analyses the media transformation, that is, the “transfer of media characteristics among dissimilar media” (Elleström, 2017, p. 667), of the semiotic modes contained in *The Last Generation*. Based on Elleström’s (2017) views on media transformation, these modes can undergo, in their evolution from the matrix Science Documentary into the ISDoc, either *transmediation* (media characteristics that are *represented again* in the sensory configuration of the target genre) or *media representation* (media characteristics, when transferred to the target genre, *represent* the sensory configurations of the source genre). Apart from that, and assuming Miller’s (2016) stance on genre innovation, this section analyses the possibility for semiotics modes to be *emergent*. Emergent semiotic modes either cannot be traced to a source genre or are rather ‘taken up rapidly in another

community because it satisfies an exigence that had been latent, unrecognized' (p. 15).

Table C.1.2 summarises the processes of media transformation that affect the semiotic modes of the ISDoc from the matrix SD.

Table C. 1.2

Media transformation of semiotic modes in The Last Generation

Semiotic modes (Media Characteristics)	Transmediation / Media representation Emerging	Role of interactivity in media transformation
Audiovisual / cinematic presentation / narration	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery
Cartography	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery • Highlighting of specific information
Data visualisation	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery • Highlighting of specific information
Photographic evidence	Media representation	<ul style="list-style-type: none"> • User controls pace of information delivery
Written evidence	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery

Out of the 5 semiotic modes that appear in *The Last Generation*, three correspond to instances of transmediation. (1) The semiotic mode of 'Audiovisual narration' is transmediated without any substantial change implied by the Technical Media of the ISDoc: the canvas of the medium engages the same audiovisual materialities without expanding any possibilities for the inclusion of more materialities or any kind of interaction other than scrolling and allowing users to control the pace at which contents are accessed. (2) 'Data visualisations' undergo transmediation, which is more noticeable in the case of the interactive instances. Static data visualisations convey materialities that are engageable in the Technical Media of both the ISDoc and the SD. Interactive data visualisations, nonetheless, are dynamically structured in a way that allows the user to follow the evolution of the

represented data through highlighting of specific information. For instance, the dynamic graph represents the relation of CO₂ emissions with the increase in sea levels changes and highlights specific centuries upon user interaction.

(3) The same process is accountable for the semiotic mode of 'Cartography': interaction on the dynamic cartography maps allows users to control the pace at which they access information and the authors to highlight the most relevant information for the selected locations. The last semiotic mode which is transmediated into the SD are the (4) 'Written evidence' texts. The materialities of the semiotic mode are practically equal to those located in basic online layouts, and the main difference from the SD genre implies the possibility for users of controlling the flow of information and accessing larger pieces of written text in a more manageable way than if projected on screens that do not allow for interaction.

In terms of media representation, *The Last Generation* only includes the semiotic mode of (5) 'Photographic evidence' in which the original source medium is represented. As noted in the previous section, the inclusion of the Instant Film developing of the photographs implies the representation of the source media (more specifically, the Technical Media) and the iconic allusion to the technical features of the matrix artefact/semiotic mode. The media transformation from the SD to the ISDoc genre implies similar affordances to the semiotic mode of written evidence, as users can access a greater number of photographs through paradigmatic interaction.

C1.1.2. IDN structure

C1.1.2.1.- Interactive Sites/Signs

Interactives Sites / Signs are defined by Adami (2013) as "links, buttons and fields, which enable users to act upon the text' and which 'are both places (sites) where the user can act and signifiers associated to signifieds (signs) sharing a meaning component which could be verbalized as 'here you can act and obtain some effects'" (p. 5). Their *forms*, *actions*, and *effects* are described in discursive terms

through their mapping onto Halliday's (1978) metafunctions (textual, ideational, interpersonal).

The ideational level of the ISS featured in *The Last Generation* implies its classification into three wide groups. The first one concerns the use of the dynamic sidebar located in the right hand-side of the screen. Syntagmatically, the ISS represents each chapter's division of contents into the different scenes (considering the audiovisual narration to be the text's articulating semiotic mode); paradigmatically, it helps advance both the narrative and the semiotic mode of the interactive data visualisations. The second ISS features a distinctive *form* of white pop-ups. The pop-ups are white boxes with black text (see contrast with written text in audiovisual narration) which, syntagmatically, contain four different labels: "Begin", "Explore", "Watch", and "Read More". Paradigmatically, clicking on them leads to different kinds of built-in materialities / semiotic modes (built-in refers to the arrangement of the materialities within the ISDoc text rather than in a hyperlinked external website, for instance). The only instance of the "Begin" ISS triggers the audiovisual narration of the Introduction (optional form is "Continue"); "Explore" involves the use of arrows and is associated to the switching of photographs in the Photographic evidence semiotic mode; "Watch" triggers the reproduction of optional videos; and "Read more" leads to the Written evidence semiotic mode. Finally, other specific ISS concern the Play-Pause ISS built in the text's videos, and the SNS ISS with their distinctive companies' logos (Facebook and Twitter).

On the interpersonal level, the ISS within *The Last Generation* offer reduced possibilities upon paradigmatic interaction. The ISS do not generally address any participant in the text, with the exception of two instances. The "About the project" ISS is located in the last lexia of the text and shapes directionality towards creators and contributors, from the writers and producers to the organisations that provide source material for the text. The integrated SNS ISS and the "Share this story" ISS are the other instances of ISS with a defined interpersonal function, in which directionality is shaped towards users and the possibility of sharing the story.

Finally, the textual level considers the regularity of ISS in producing predictable changes in the text. As the analysis of the ideational level hints, the before-after relation of *The Last Generation* materials through ISS is highly cohesive since their *form* and *action* produce regular effects in terms of the materialities accessed. The built-in material accessed upon paradigmatic interaction fulfils a function of continuation and expansion of materialities and semiotic modes. For instance, the Written evidence semiotic mode can only be accessed through interaction with the “Read More” ISS. Moreover, newly accessed text can be said to follow a highly cohesive relation with the Given material because of the links between their lexias.

A specific way of providing cohesion to ISS (and the narrative design, as the next section will analyse) is through the use of an interactive board which represents the tryptic of chapters that conforms the story. While the interactive board is certainly a recurring tool for digital genres with a variety of social actions / communicative purposes (see for instance genres or platforms which mimic physical boards), it cannot be said to be an embedded genre³⁴. If we attend to the criteria outlined in Chapter 4, the presence of the interactive panel does not fulfil the third condition. While it has an independent existence outside the ISDoc and allows for users’ interaction and active building of knowledge, it does not have a communicative purpose on its own that it is able to enact both in the text and independently. In other words, other than structuring the specific information of this ISDoc text, it does not fulfil a similar function to the ‘independent’ genre of interactive boards.

The board is reduced in that it eliminates the key element of user authorship and merely retains several features related to shape. First, it is shaped as a tryptic which enlarges images when clicked on. The platform itself favours left-to-right navigation through the overlapping panes of the tryptic. Second, while interactive boards may be subject to including semiotic modes, the only materialities in each part of the tryptic are static written descriptions and the ISS that initiate each interviewee’s story. Overall, the board has a reduced form as compared to other

³⁴ See Alhamadi (2020) for an overview of interactive dashboards’ affordances in terms of usability, user navigation, and adaptability to different contexts.

similar genres and its only function in the text is to articulate the three stories. As a Media Characteristic, interactive boards contribute to the social action of the ISDoc genre by fulfilling the 'Active Edification' clause. In that sense, the board allows users to arrange the documentary materials by choosing the preferred path / chapter to follow and enabling potential replays of the experience.

Ultimately, in *The Last Generation*, the text features specific built-in ISS that allow to go back to the lexia / scene in which the main audiovisual narration was stopped, and even this main narration offers the possibility of returning to the base interactive board by interacting with the top-left ISS which formally represents the story tryptic. Ultimately, this highly cohesive structure of Given-New information reduces the possibilities for users' own arrangement of the text materials.

C1.1.2.2.- Interactive Digital Narrative design (Protostory design)

As shown in Figure C1.1, *The Last Generation* is an ISDoc text whose design allows limited possibilities for users' manipulation of the narrative structure. Lexias within the text are grouped into chapters, thus limiting the possibilities for ordering the independent lexias. If, as exposed in Chapter 4 following Koenitz's (2023) theory for IDNs, redundant replays are omitted, an instantiated *product* of the text would feature one path and five steps / links through the chapters, two of them being restricted within the instantiation. The first step from Introduction allows interaction towards any chapter; nonetheless, the final step ('Share this story' / 'About this project') is only enabled after completing the 'Future' chapter. In terms of the text's protostory, the chapter structure allows for 6 differentiated paths through three-fold interaction: every time a chapter is completed, the semiotic mode of the interactive board tryptic allows to play (and replay) any chapter.

Figure C. 1.1

Overview of chapters and potential instantiation of The Last Generation

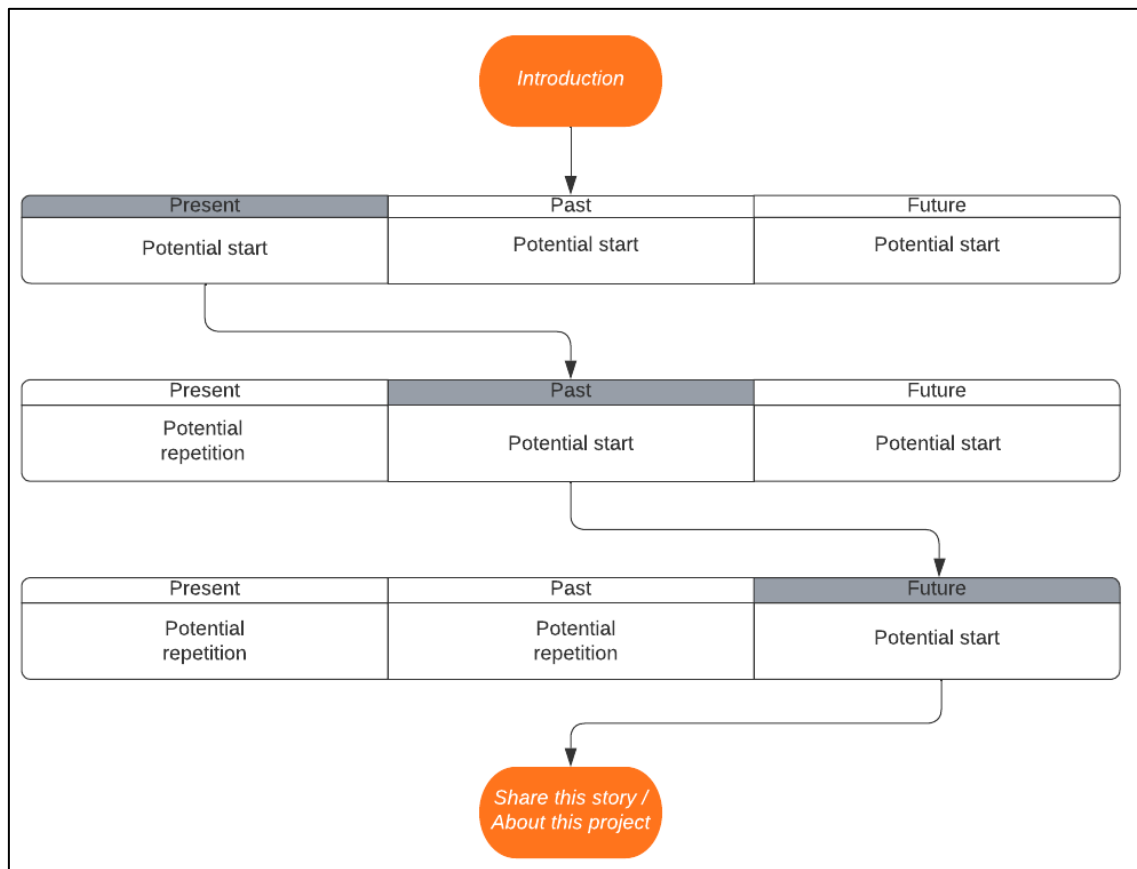
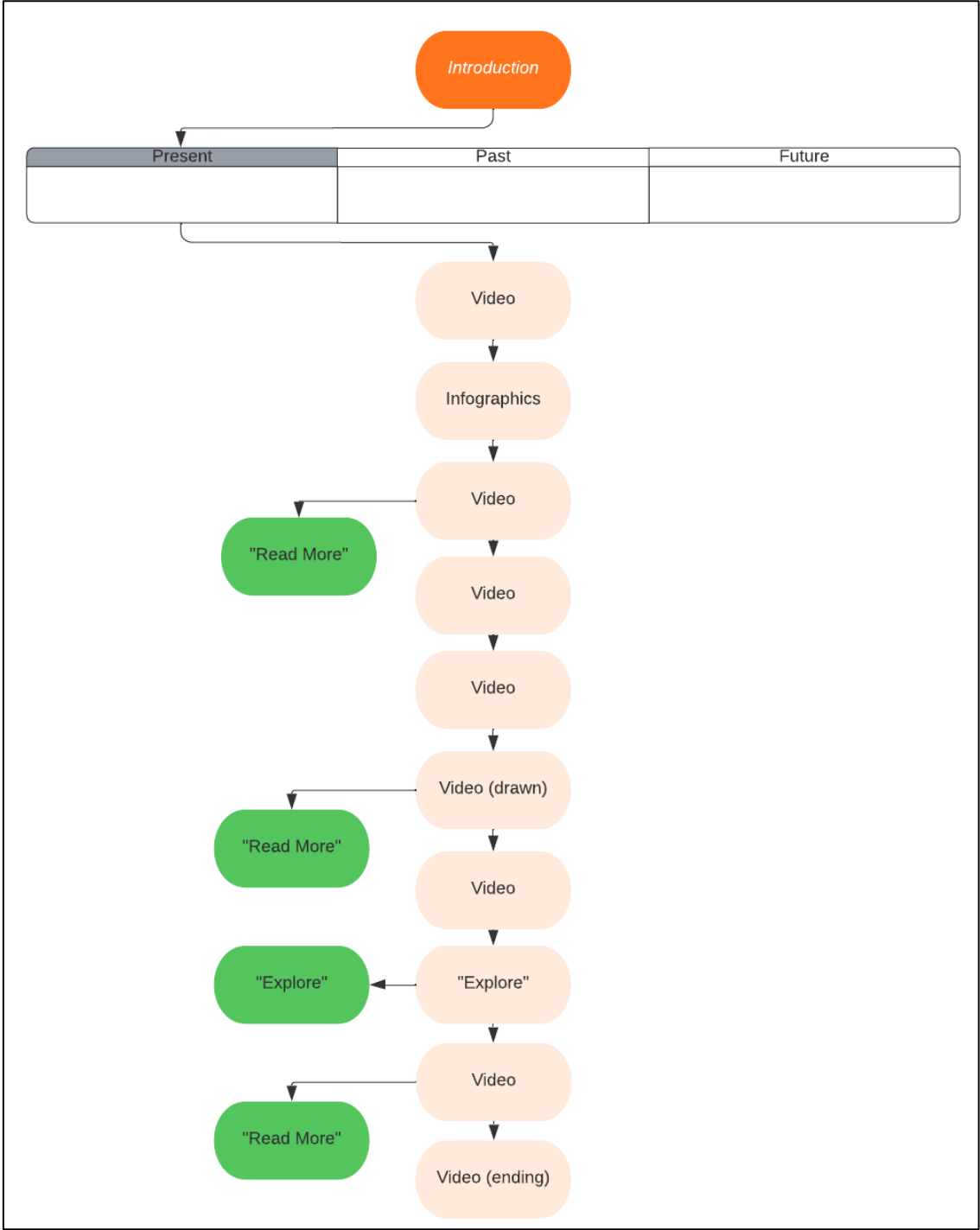


Figure C.1.2 represents an instance of how lexias are arranged within the text's chapters. In the case of the 'Present' chapter, 10 syntagmatic lexias form the structuring of the main narration. The core semiotic mode is the 'Audiovisual narration', which appears in 8 lexias. The other two syntagmatic lexias feature the Data visualisation semiotic mode (interactive, labelled in Figure C.1.2 as 'Infographics') and the 'Explore' ISS. Paradigmatic lexias in the text (4 instances) are accessed through the corresponding ISS pop-up to material that is built in the platform, but which changes the overall layout of the contents; going back to the root narrative implies interacting with the 'Back' ISS. This is the case of the 'Read More' and 'Watch' ISS, which differs from the 'Explore' ISS. As marked in the link between the 'Explore' syntagmatic and paradigmatic lexias in Figure C.1.2, interaction with the ISS does not produce a subsequent change of the overall layout. Interaction only changes the photographs in the reel. In that sense, the 'Explore' lexias can be classified as lexias which are accessed through syntagmatic

interaction (dynamic sidebar), which feature ISS with paradigmatic realisation, which expand the text's resources by introducing new factual evidence, materialities, and semiotic modes, but which do not imply a change in the layout. The ensuing conclusion is that the paradigmatic lexias in *The Last Generation* are arranged and hierarchised in different ways within the text.

Figure C. 1.2
Syntagmatic and paradigmatic lexias and links within 'Present' chapter



C1.2. SCIENTIFIC CONTENTS AND LEGITIMATION OF SOCIAL ACTION

C1.2.1 Documentary Contract Clause 1: Truth and Reality

The Last Generation displays different *narrative modes* (as described by Van Dijck, 2006) geared towards the fulfilment of documentary's truth and reality clauses. As analysed in section 1.1.1, the text displays several semiotic modes and genres which, overall, contribute to the legitimization of the ISDoc's social action as a factual genre. Table C.1.3 summarises the results:

Table C. 1.3

Semiotic modes and narrative modes in The Last Generation

Semiotic modes	Narrative mode
Audiovisual / cinematic presentation / narration	Expository + Reconstructive
Cartography	Expository + Reconstructive
Data visualisation	Reconstructive + Explanatory
Photographic evidence	Expository + Reconstructive
Written evidence	Expository + Reconstructive + Explanatory

As explained in previous sections, audiovisual narration is the main semiotic mode found in *The Last Generation*. This semiotic mode is related to the 'Expository' narrative mode and reality effect. This classification is based on Van Dijck's definition of the reality effect as mainly created through 'film and video footage'. Nonetheless, in ISDoc texts, the 'Expository' mode cannot be said to be equated to Van Dijck's paraphrasing of the mode as 'this is what science is' (2006, p. 11). As a hybrid genre, the ISDoc claims to factuality and is not only reduced to showing what scientific ideas or paradigms entail (which are features of the 'Expository' mode for the Science Documentary). Rather, in the impression of truth, the ISDoc combines the aforementioned 'this is how science is' with the matrix documentary genre 'evidentiary' effort, which, as explained in Chapter 1, is concerned with providing audiences with material (scientific or not) that is decoded as factual within the documentary's narrative. In this sense, through the audiovisual semiotic mode, *The Last Generation*, includes material which mostly consists of the

participants' testimonies, footage of their way of life (depicting everyday aspects such as going to school, fishing, or depicting the most visited places in the Marshall Islands). As such, instead of displaying the scientific reasons for the increase of the water level, *The Last Generation* makes use of the 'Audiovisual narration' semiotic mode as a way to situate the natural phenomenon in a manner that audience can empathise with the Marshallese and prove that the problem is indeed *real*. Similarly, the 'Reconstructive' mode for this semiotic mode neither conforms to Van Dijk's definition for the SD nor does it produce a 'fiction effect' nor is it based on reenactments. The 'this is what happened' 'Expository' mode is realised in the text through recordings of past events featuring the increasing flood levels in the island, or historical footage of US military members asking Bikinians to evacuate the islands in order to proceed with their nuclear tests. Once again, this narrative mode is mostly geared towards proving that the reasons for the current state of the Marshall Islands are justified by *real* events that took place earlier in the past.

There are few instances in the text in which 'Audiovisual narration' introduces scientific ideas directly in the 'Expository' mode. What is more relevant is that they feature the text's most distinct way of interaction in terms of both possibility of action and organisation of lexias. In Izerman's and Julia's story, suddenly, users cannot further scroll when the video footage of the participants gives way to drawings representing the representation of scientific events. In Izerman's story, the sentence uttered by the boy ("If the ice melts too much, water will bury the island") presents a summed piece of information which is then followed by a more developed explanation through the prototypical black boxes; in Julia's, her sentence ("When they [clouds of smoke] go up, they make atmosphere angry, and that's how it makes big change in our island") is followed by the same boxes. Similarly for both stories, these 'Video [drawn]' lexias are then succeeded by 'Read More' lexias. Consequently, it can be inferred that this climactic change in interaction patterns entails a scaffolding of scientific information, in a sequence that evolves from the factual representation of the participants' testimonies and perceptions about climatic change towards the authors' and later expert figures that corroborate and expand their findings.

Other semiotic modes within *The Last Generation* evidence a similar realisation of factuality through both the 'Expository' and 'Reconstructive' mode. The 'Cartography' semiotic mode presents the factual information of the Marshall Islands (and its inhabitants') location in the 'Expository' mode, and reconstructs the location of the nuclear tests carried out in the atoll during the second half of the 20th century. 'Photographic evidence' similarly represents the effects of climate change on the islands' vegetation, the islanders' living conditions, coastline erosion ('Expository' mode) and the effects of radiation, news clippings retelling the explosions, and the mushroom-shaped nuclear cloud ('Reconstructive' mode).

'Data visualisation' equally features the 'Reconstructive' mode, in which the representation of the evolution of CO₂ levels in the Marshall Islands adopts the visual conventions of other independent genres. Nonetheless, data visualisations *per se* are not sufficient to establish factuality exclusively by representing data in an interactive, simplified manner. In spite of claiming factuality and objectivity through reconstruction, data visualisations in *The Last Generation* are examples of the 'Explanatory' mode. Through the 'this is how science works' mode, these instances of 'symbolic visuals' only establish factuality in the text if its lexia is preceded by others which present factual information through the 'Expository' and 'Reconstructive' mode. In other words, and following Julia's example previously mentioned, the interactive data visualisation of the carbon dioxide levels can only be taken as real by audiences once the aforementioned scaffolding in scientific information takes place and the audiovisual narration of the lexias in the sequence has already provided sufficient context for users.

Although the most reduced in terms of digital materialities involved, the 'Written evidence' semiotic mode conveys the use of the 'Expository', 'Reconstructive', and 'Explanatory' modes. This amalgamation arises from several factors. First, the semiotic mode includes mainly written text, but it occasionally features non-interactive data visualisation, which fulfils the 'Explanatory' mode's goals. In a similar manner to its interactive counterpart, its claim to factuality is established once other materialities enact other narrative modes. Secondly, the 'Expository' and 'Reconstructive' modes are enacted through written representation of the

cause-effect events that explain the current climatic emergency of the Islands: the latter mode provides the historical context, the former establishes the consequences. This is noticeable in excerpts such as the following:

Among the risks of having such a low elevation is that when big waves hit, they can wash all the way across the island. That's what happened in December 2008, when waves from a distant storm coincided with an especially high tide, and the sea flooded hundreds of islands in the western Pacific Ocean. Among them was Roi-Namur, an island in Kwajalein Atoll, where the United States Department of Defense maintains a ballistic missile defense site. Like its neighbor Majuro, Kwajalein has a uniformly low elevation. The waves wrecked buildings, killed crops and seeped into the groundwater. The water remained too salty to drink for the next 22 months. ('Present' chapter).

The first sentence provides an explanation for the consequences of sea level rising, although in a simple manner. It *explains* and *exposes* scientific information by establishing the correlation of waves' power with the distance they can potentially cover (in a zero-conditional sentence). The rest of the excerpt provides the *reconstruction* of the events that provide the factual basis for the hypothesis. In the third place, the written evidence semiotic mode establishes the factuality of the text by featuring the 'authority figure' legitimization strategy (Van Leeuwen, 2008): the texts include experts' quotes and other general references or allusions as part of the narrative modes' strategies to build objectivity, even mimicking the moves of the academic reporting style and IMRAD. The excerpt summarises Storlazzi's study findings and conclusions:

After the floods, geologist Curt Storlazzi of the U.S. Geological Survey led a study exploring what the future may hold for Roi-Namur. The study concluded that unless the military undertakes measures to protect the island, once the sea rises 40 centimeters (16 inches), the island will likely face enough wave-driven flooding every year that its groundwater could become permanently salty. Once it rises a meter (39 inches), half the island will find itself underwater an average of once a year because of the waves.

The study's findings hold a warning for all islands that share Roi-Namur's low elevation, Storlazzi said. ('Present' chapter).

Finally, the written evidence 'Read More' ISS is only accessible through paradigmatic interaction, which suggests that only those readers that seek to expand the simplified knowledge of the scaffolding sequences will access these contents.

The last semiotic mode of the interactive board cannot be said to enact any narrative mode or claim to objectivity. As previously stated, its function is merely structural and does not include any other information apart from the classification of possible narrative paths.

C1.2.2 Documentary Contract Clause 2: Taking action and Edifying actively

Users' access to contents in *The Last Generation* is determined by how lexias are arranged in the narrative structure and how interactivity allows navigation through them. Adding to this, and as the previous section explored, the semiotic modes in the text are systematically associated with narrative modes. In the context of the 'Truth' clause in the ISDoc genre, these narrative modes are related to how authors establish the validity and factuality of scientific content (mostly contained within the 'Explanatory' narrative mode) through narrative modes ('Expository' and 'Reconstructive') that provide verifiable and factual background³⁵. In this sense, the scaffolding sequences that were analysed in the previous section represent a starting point for determining how users take action and actively edify knowledge upon interacting with *The Last Generation*. To briefly summarise these scaffolding sequences: lexias with the semiotic mode of audiovisual narration briefly remove the users' interaction (syntagmatic or paradigmatic) with the narrative and lead to lexias that require paradigmatic interaction. In terms of narrative modes, the former 'Explanatory' and/or 'Reconstructive' lexias, where scientific information is recontextualised by the protagonists' narrative's, provide the scaffold for the

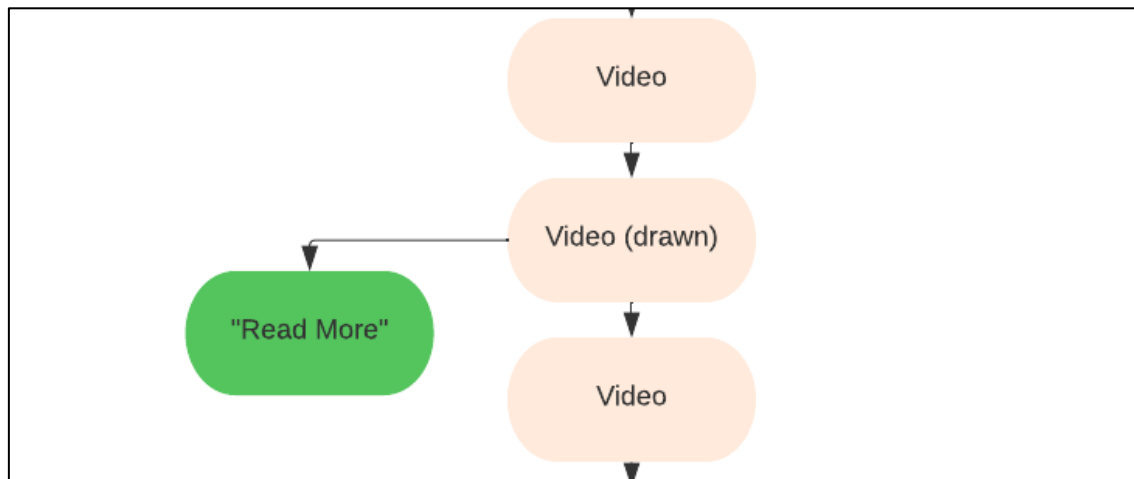
³⁵ Due to the indexical nature of the semiotic modes employed with the events they represent.

‘Explanatory’ lexias, in which scientific information is recontextualised by scientific figures and experts in the field.

From this scaffolding sequence, and considering interactivity as an enactment of the Taking action clause, a guiding principle can be established for *The Last Generation*: the text’s structuring of ISS produces different story instantiations. Syntagmatic and paradigmatic possibilities for interaction respectively produce a narrative based on ‘Expository’ and ‘Reconstructive’ contents, or other which additionally includes the explanatory contents. In this sense, the way in which users access contents and choose the information they want / need to know is entirely dependent on their interaction with the paradigmatic ISS in the text. Figure C.1.3. Summarises this scaffolding sequence:

Figure C. 1.3

Scaffolding sequence of lexias in ‘Present’ chapter



In the ‘Present’ chapter, an instantiation performed through syntagmatic interaction (orange boxes in C.1.3) would comprehend the following narrative modes. First, Video 1 makes use of the ‘Expository’ mode to show Izerman attending a lesson about climate change. Next, interaction is removed, and Video (drawn) first shows a graphical representation of ice melting while Izerman recontextualises the outcomes of increasing temperatures in simple terms (uttered by a child), which is then followed by the black boxes recasting this information in more advanced terms (this time, not uttered by a child, but by the ‘authorial voice-of-God’). Syntagmatic interaction leads to the Video 2 lexia, where narration goes

back to Izerman's attending the science lesson. In all of these lexias, only the 'Expository' and 'Reconstructive' modes are engaged by users. By contrast, an instantiation with paradigmatic interaction allows users to access an optional lexia whose semiotic modes, in the text, expand scientific information by including the 'Explanatory' mode. Here remediation of scientific contents is only carried out by rephrasing the words representing "authority" in a succinct form. In terms of resources assigned to this task, users might find more time-consuming and cognitively demanding to explore these additional contents and to navigate through a semiotic mode ('Written evidence') which, as regards the aesthetics of interactivity, is less appealing than the dynamic syntagmatic audiovisual narration mode. So, what are the implications for this phenomenon?

Such systematicity in terms of hypersemiosis reflects that there exists a strong connection between the interactive choices that are available in the narrative as part of its social action. On the one hand, it illustrates how users interpret these choices to freely and independently construe the knowledge to both access the platform and the kind of contents they desire. In a narrative with strictly predefined paths, where free interaction and ordination across lexias cannot occur, and in which users' role in acting upon paradigmatic ISS is limited to few instances in the text, users navigate an ISDoc text that limits the interactive possibilities to maximise the relation that paradigmatic interaction bears with the nature of contents accessed. What users can infer from this structure is that if they click on all ISS, they will access contents which, in a technical manner, explain the contents that they watched in a remediated manner up to two times (children's remediation, and authors' remediation). In that sense, the users may develop through the instantiation the ability to systematically relate interaction with the "Explore", "Watch", and, above all, "Read More" ISS with an expansion of scientific contents (narrative modes) in the text.

Ultimately, what this structure suggests is that *The Last Generation* fulfils its genre legitimisation of the 'Take action' clause by (1) providing audiences with different possibilities to engage contents based on the required interaction, (2) eliminating redundant or looping instantiations by reducing pre-defined paths (chapters), and

(3) maximising the memorability of the systematic arrangement of lexias in a scaffolded manner so as to allow users to preemptively strategise about the interactive choices they want to take through the instantiation.

CASE STUDY 2: INFOAMAZONIA

C2.1. HYPERSEMIOTIC STRUCTURE

C2.1.1. Semiotic modes in interactive contexts

C2.1.1.1.- Semiotic modes

Table C.2.1 features the semiotic modes that appear in *InfoAmazonia*:

Table C. 2.1

Semiotic modes in InfoAmazonia

Semiotic mode	Embedded genre	Interactivity	Expressive resources and material substrate
Written evidence	No	Yes	<ul style="list-style-type: none"> • Written text, longer excerpts • Different materialities / formats depending on embedded genre (associated visuals for headings and backgrounds) • Occasional syntagmatic hyperlinking (pop-up explanations)
Photographic / Audiovisual evidence	No	Yes	<ul style="list-style-type: none"> • Written text (captions) • Inclusion of interactivity (comparison)
Data visualisation	Yes	Yes	<ul style="list-style-type: none"> • Present in interactive and non-interactive form • Paradigmatic interactivity enables expansion of information (labels and photographic evidence) • Possibility of indexical relation to represented data
Cartography	Yes	Yes	<ul style="list-style-type: none"> • Present in interactive and non-interactive form • Completely free navigation and choice of data representation (layers) for interactive maps • Possibility of syntagmatic navigation through maps and associated written features

The first of the 4 semiotic modes that appear in *InfoAmazonia* is that of ‘Written evidence’. In line with the journalistic intent of the webpage, the different entries

that correspond to individual pieces of news are mostly based on plain text. This is the only common characteristic that different instances of the semiotic mode feature throughout the web. The rest vary depending on one of *InfoAmazonia*'s way of classifying embedded genres: whether they are 'Long forms' or not. This is not sufficient to claim that this kind of semiotic mode is an 'embedded genre' per se. Rather, within this ISDoc, the semiotic mode can be triangulated through the optics of different categories (or genres) based on purely textual and aesthetic values, not because of independent social actions that they could potentially enact.

In terms of word count, the first difference between the Written evidence semiotic mode in 'Long forms' and its counterpart is that while the former include 3800 words, the latter feature a variable number ranging from 500 to 1500. The second distinction pertains to the differences associated with each form in terms of formatting and the inclusion of different materialities other than textual. As depicted in Figure C.2.1, 'Long forms' regularly make use of different fonts, sizing, colours for text (base text and headings) and background. This is more significant in the case of the so-called 'Amazon Underworld' series, a serialised string of pieces of news that connect the Amazon's issues in conservation of wildlife as a result of human activity to criminal economies. The differences are noticeable when compared to the 'Short forms' (own terminology; Fig. C.2.2) in terms of the aforementioned features and also the inclusion of small drawings for the 'Long forms' headings.

Figure C. 2.1
Semiotic mode of ‘Written evidence’ for ‘Long forms’

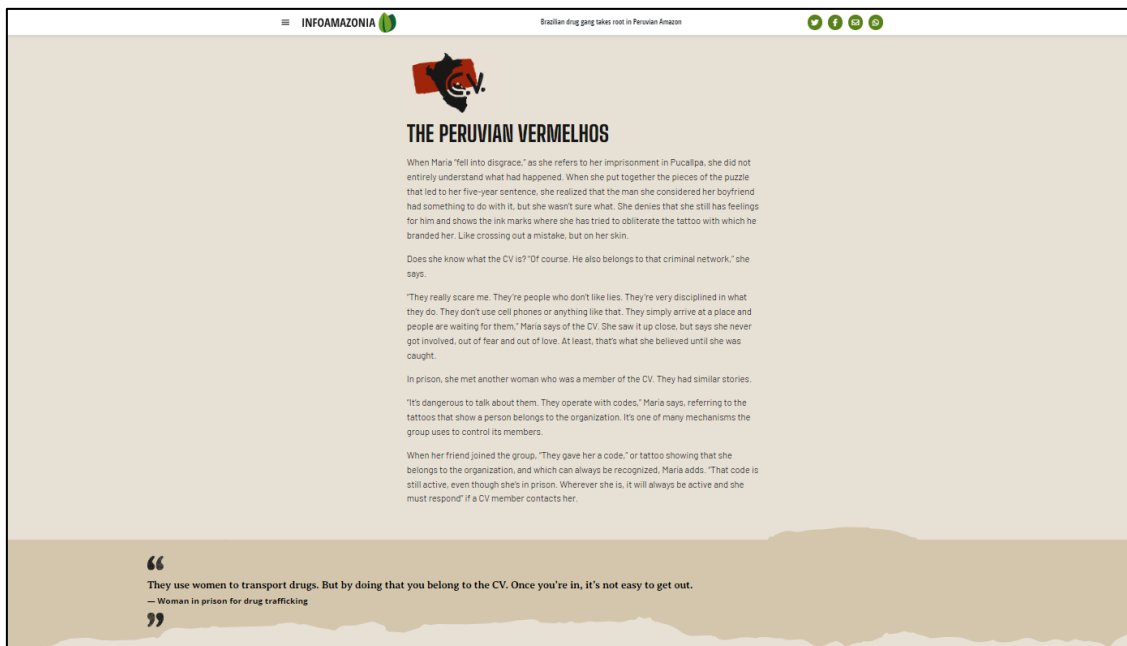
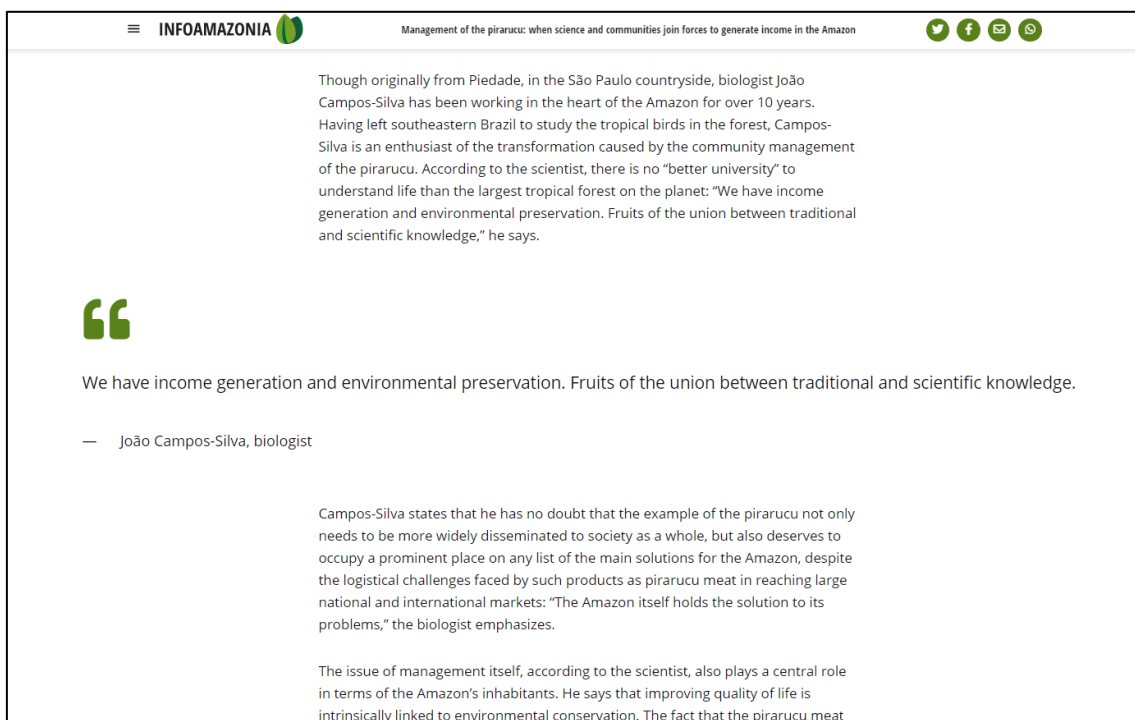


Figure C. 2.2
Semiotic mode of ‘Written evidence’ for ‘Short forms’

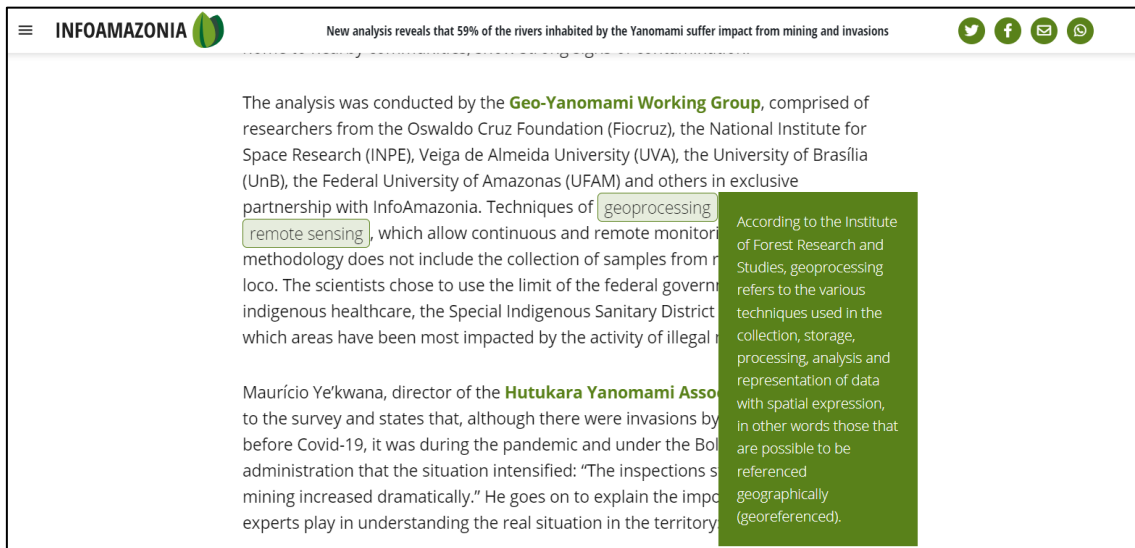


Finally, in terms of navigation throughout the semiotic mode, ‘Long forms’ allow for users to scroll down (syntagmatic interaction) through the page and include hyperlinking in the traditional form (underlined text in bold or other colour;

paradigmatic interaction). For ‘Short forms’, the latter hyperlinking can occur syntagmatically within the page by means of pop-ups (Fig. C.2.3), and is usually geared towards remediating scientific information for non-expert audiences. Section 1.2.1 will expand discussion on this issue.

Figure C. 2.3

Semiotic mode of ‘Written evidence’ for ‘short forms’: pop-up menus

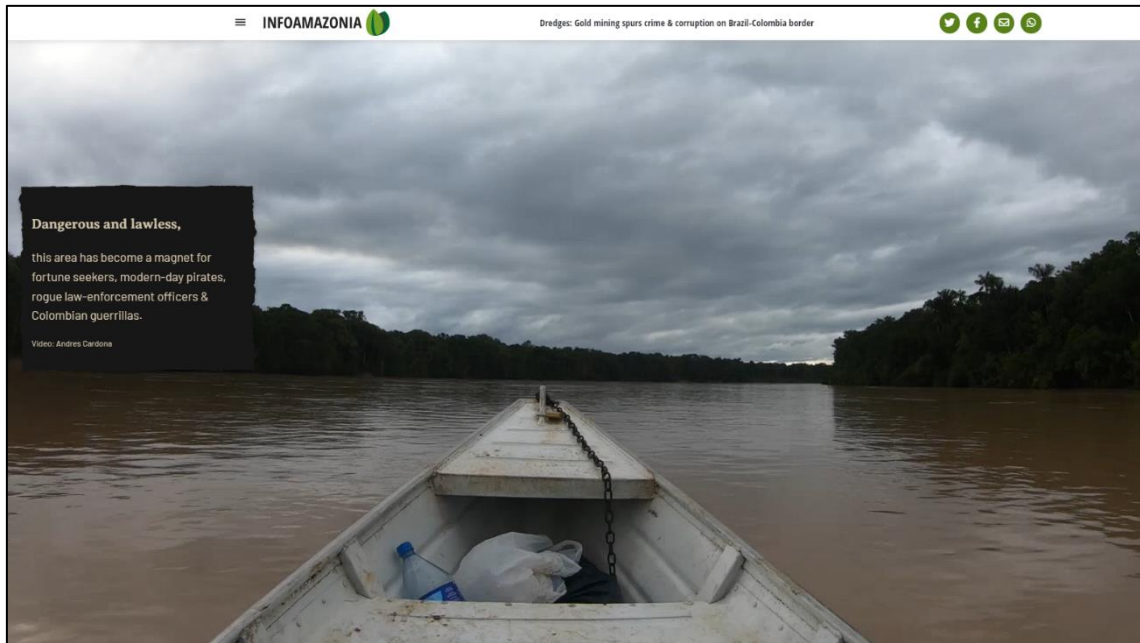


The second semiotic mode is the ‘Photographic / Audiovisual evidence’. Once again, what differentiates the status of the photos and the videos which are included in the platform and constitute a semiotic mode from other audiovisual representations (for instance, the aforementioned drawings in headings), is the role they enact within the ISDoc’s social action. In line with the Truth clause, what mainly defines this mode’s materialities is the factual evidence they convey. And, as in the case of the first semiotic mode, there are differences between ‘Long’ and ‘Short forms’ in the way ‘Photographic / Audiovisual evidence’ is embedded within the platform. While the latter is usually embedded with no modifications to the site’s layout³⁶, the former may include instances in which this semiotic mode is presented in full screen and with distinct text in the form of captions (Fig. C.2.4).

³⁶ Including embedded YouTube videos.

Figure C. 2.4

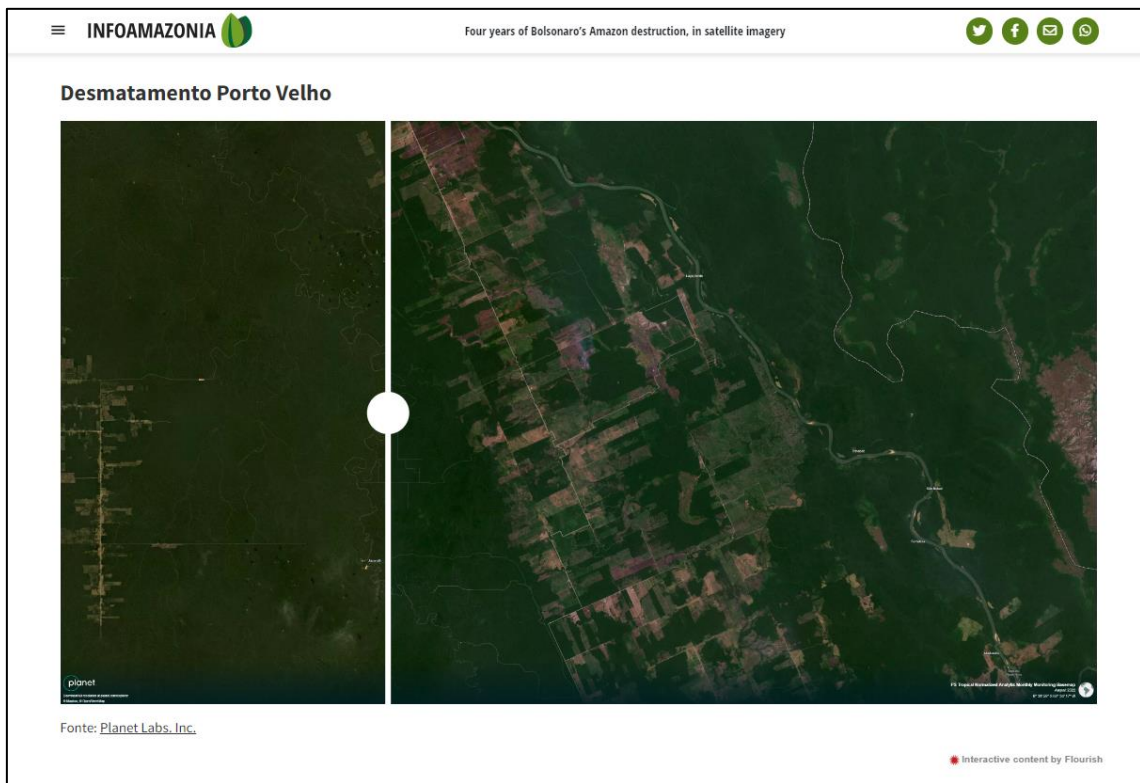
Semiotic mode of 'Audiovisual evidence' for 'Long forms': text captions



The semiotic mode of 'Photographic evidence' includes paradigmatic interactivity in two main ways. The first is the standard photo-reel which can be interacted through arrows (but also allows users to see a full gallery display in some instances). The second is remarkably interactive in the way it allows users to directly act upon the materialities of the web. In Figure C.2.5, the white slider can be used to control the highlighted area affected by deforestation.

Figure C. 2.5

Semiotic mode of 'Photographic evidence': interactivity



Apart from enacting the documentary's social action by providing factual evidence, photographs that show the contributors involved in the creation of the stories are included throughout the site. This suggests that, together with the factual (ideational) intent, the site aims at providing users with 'interpersonal evidence', thus reinforcing the links between the stories they present and the process of data collection by portraying the people that are committed to research on Amazon.

The third semiotic mode of 'Data visualisation' is integral to the dissemination purpose of *InfoAmazonia* and how it tries to demonstrate the traceability of its claims to the source data. Figures C.2.6 and C.2.7 are examples of interactive and non-interactive forms of the semiotic mode. The former and other instances within the site allow for specific data to be accessed when hovering the mouse over the reference points in graphs. In other words, when interacted upon (paradigmatically), information is expanded by including additional material such as captions and other labels with scientific knowledge. In any case, what is more relevant about both examples is that they acknowledge the source data for the

elaboration of the graph in a deeper manner than what the caption below indicates. In fact, Figure C.2.6 is extracted from another serialised string of news named ‘Fire. Inhaling Smoke’. Apart from the usual sub-sites with different semiotic modes, the series allows users to consult the raw data that was used in the elaboration of the charts. The section under the name ‘Data visualisation: Inhaling Smoke dashboard’ specifies the following:

Data dashboard of the Inhaling Smoke project, with results of the statistical analysis for all states and municipalities of the Brazilian Legal Amazon, with filters by month and geographic location. Table with data selection can be downloaded and is open to use.

I would argue that data visualisations are embedded genres that play a fundamental role in enacting the ISDoc’s ‘Truth’ clause; nonetheless, within *InfoAmazonia*, the possibility of accessing the open source data and even methodological guidelines suggests that although embedded, these genres (or sub-genres) come to integrate a ‘documentary genre set (following Devitt’s terminology) in which they are dynamically inter-connected and fulfilling the social action of the overall ISDoc.

Figure C. 2.6

Semiotic mode of ‘Data visualisation’: interactive graph

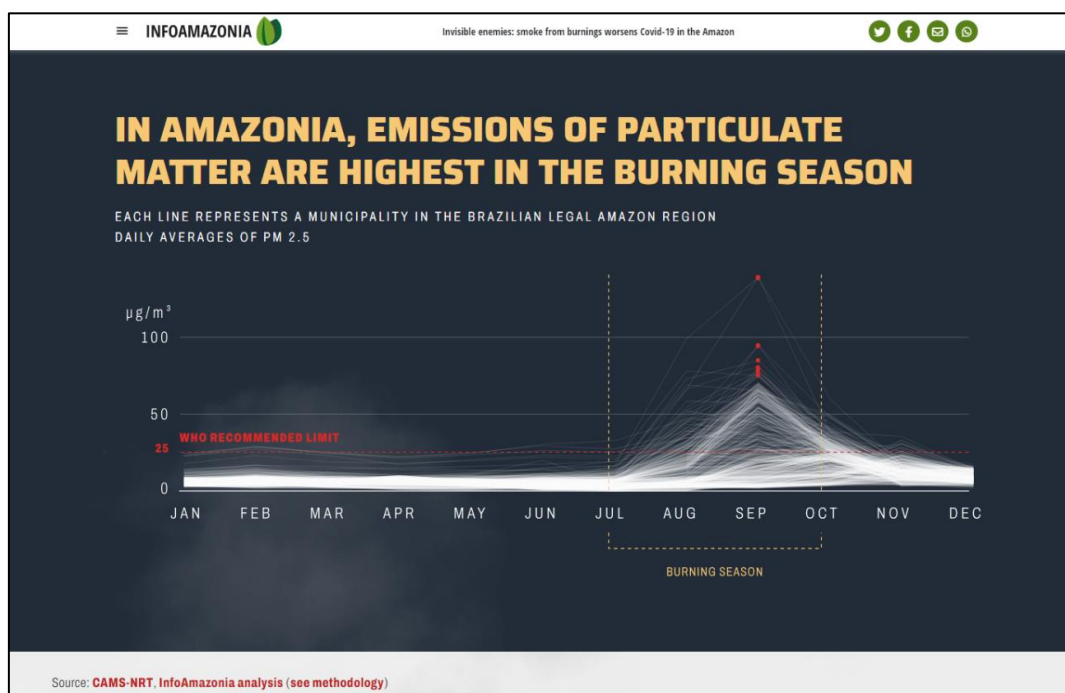






Figure C. 2.7
Semiotic mode of ‘Data visualisation’: non-interactive table

INFOAMAZONIA

PPCDam: new plan against deforestation includes technologies to anticipate devastation and investment in bioeconomy to develop the Amazon



The new PPCDam foresees 4 main axes

The project is open to public consultation until April 25.

Axes	Actions
1. Sustainable productive activities	Strengthening the bioeconomy Application of sustainable management and recuperation of degraded areas Dialogue with the 9 states of the Legal Amazon
2. Environmental oversight and control	Effective accountability for crimes and violations against the environment Improvements in the monitoring of destruction and its chains Prevention of destruction Coordination with the 9 states of the Legal Amazon
3. Land and Territorial Planning	Protection of undesignated public lands Expansion and streamlined management of currently protected areas Improvement of the Rural Environmental Registry System (SICAR) Large enterprises aligned with the goal of zero deforestation by 2030
4. Normative and Economic Instruments	New normative and economic instruments to contain deforestation

Table: PlenaMata/InfoAmazonia • Source: Ministry of Environment and Climate Change • [Get the data](#) • Created with [Datawrapper](#)

As Figure C.2.8 exemplifies, the semiotic mode of ‘Data visualisation’ can be combined with other semiotic modes, this time with ‘Photographic evidence’. Syntagmatic exploration of the data visualisation results in a scrolling action which, instead of following a downwards motion, changes from left to right. Additionally, the captions (white background) feature the possibility of paradigmatically interacting with them in order to show the photographic evidence that justifies the claim above.

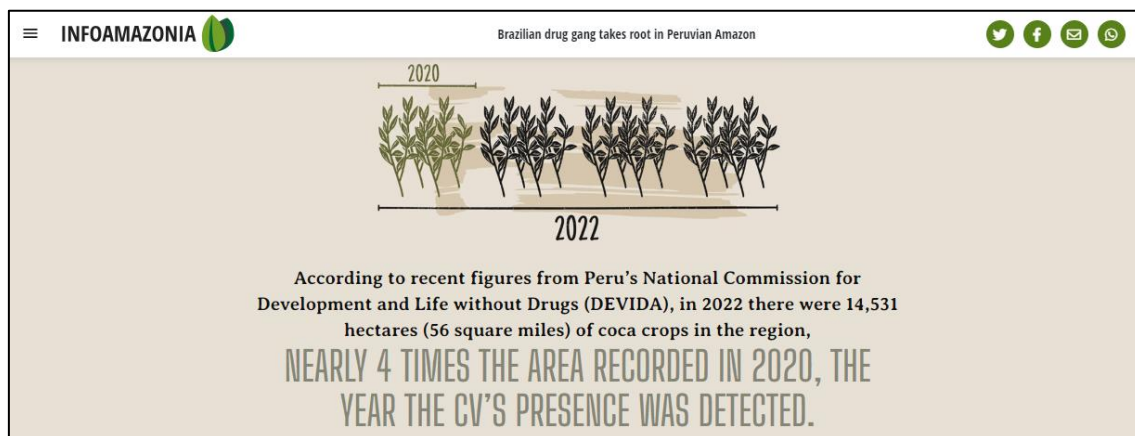
Figure C. 2.8
Semiotic mode of ‘Data visualisation’: interactive, and overlapping photographic evidence semiotic mode



Finally, and in terms of ‘Data representation’, the semiotic mode features the possibility of establishing indexical or iconic (rather than symbolic) relation to the represented data. In that sense, instead of presenting graphs (which are symbolically related to the signified and are only interpreted upon cultural nurturing), some of the instances of the semiotic mode depict resembling evidence (indexes) or the physical resemblance (icons) of the signified. Figure C.2.9 is an example of icons representing the signified (the coca plants) in a visual manner which, ultimately, is used to remediate scientific / technical information to wider audiences.

Figure C. 2.9

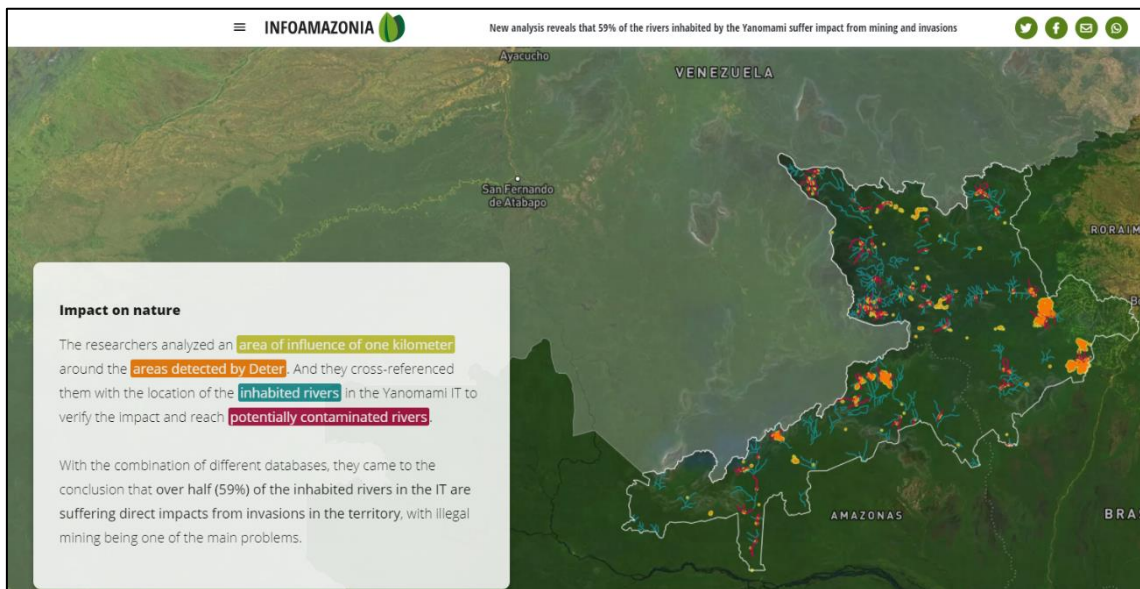
Semiotic mode of ‘Data visualisation’: iconic representation of signified



In the last place, the semiotic mode of ‘Cartography plays’ a fundamental role for the representation of the endangered Amazon region in the ISDoc. In fact, the role it plays within the ISDoc as a genre set arguably renders it the fundamental semiotic mode. This is because the instances of maps that appear throughout the platform are ‘fed’ from the aforementioned open-sourced data. While the semiotic modes generally remain independent in terms of the kind of data they represent, usually the data visualisation mode is ancillary to the cartography, since the site’s texts revolve around showing the specific location of the Amazon’s ongoing natural issues. ‘Cartography’ in this ISDoc appears in both its interactive and non-interactive form. The former resembles more a sort of ‘Photographic evidence’ mode, but its materiality is fundamentally different and the relationship it establishes with the signified is indexical, not iconic. In terms of interactivity,

mode offers a wide variety of possibilities in integrating different navigation stances. Firstly, and especially in the platform's series, maps are built in the same page as the text, introduced by dynamic transitions (parallax scrolling), and which are interacted upon syntagmatic navigation (scrolling down). These instances (Figure C.2.10) include associated text in white boxes and usually relate the highlighted areas in the map to the specific captions (coloured text). Moreover, these cases feature transitions in the representation of data: usually, these data are sequenced in ways that logically connect the information from the maps in a way that facilitates users the connections between them.

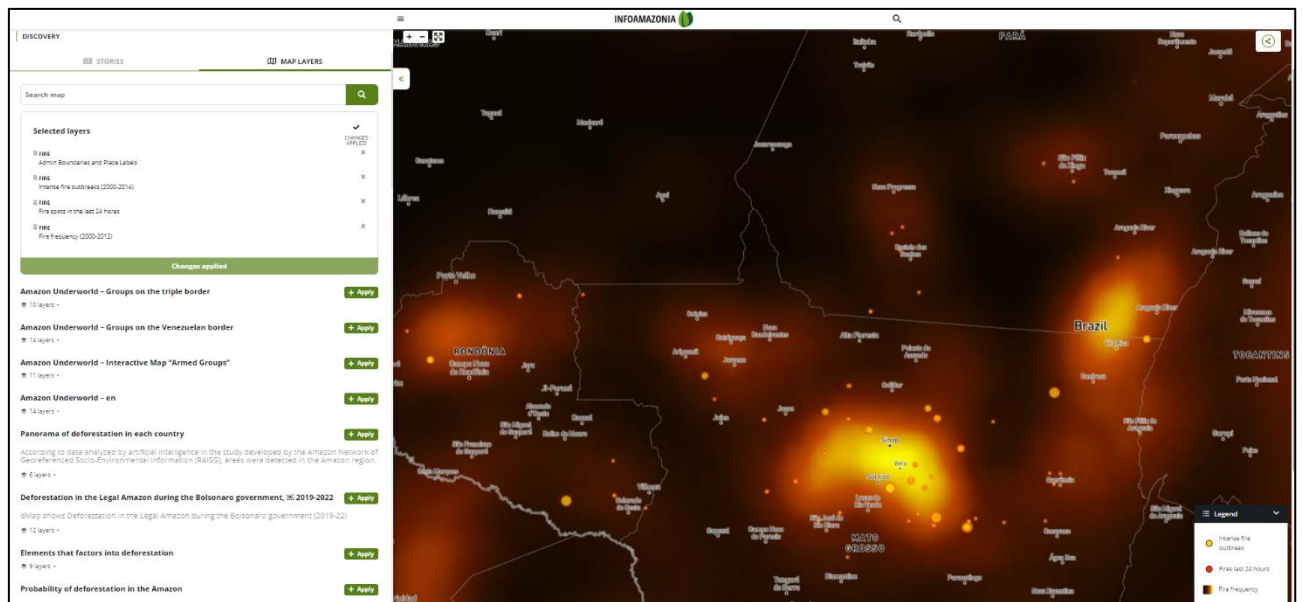
Figure C. 2.10
Semiotic mode of 'Cartography'



Note. Relation of text and visual materialities through colour

The platform also offers an integrated map that culminates the interconnections established in the genre set of the ISDoc. This map (Figure C.2.11), located in the 'Discovery' tab, connects the open-sourced, real-time data that articulate the news to the complete Amazon region. This tool offers completely free navigation and choice of data representation, allowing users to include and combine information ('Stories' tab) and layers ('Map layers') without restrictions. Ultimately, what the map allows is to unify the individual projects and tell a story of a region, evidencing all the issues that affect it through open-sourced data ('Truth' clause) and letting users freely manipulate them ('Edifying' clause).

Figure C. 2.11
Semiotic mode of ‘Cartography’: ‘Discovery’ map



C2.1.1.2.- Media transformation of the ISDoc’s Media Characteristics

The following table sums up the processes of media transformation that affect the ISDoc’s semiotic modes from the matrix SD.

Table C. 2.2
Media transformation of semiotic modes in InfoAmazonia

Semiotic modes (Media Characteristics)	Transmediation / Media representation / Emerging	Role of interactivity in media transformation
Written evidence	Transmediation	<ul style="list-style-type: none"> User controls pace of information delivery User accesses remediated information within the page
Photographic / Audiovisual evidence	Transmediation	<ul style="list-style-type: none"> User controls pace of information delivery
Data visualisation	Transmediation	<ul style="list-style-type: none"> User controls pace of information delivery Highlighting of specific information User accesses remediated information within the page
Cartography	Transmediation	<ul style="list-style-type: none"> User controls pace of information delivery Highlighting of specific information User accesses remediated information within the page

All semiotic modes in *InfoAmazonia* correspond to instances of transmediation. The 'Written evidence' semiotic mode is transmediated into the digital platform fostering the capabilities of the interactive medium of hyperlinking. While it could be argued that the pictures imitating hand-drawn style are cases of media representation, their appearance is marginal and no regularity in its use across the platform can be inferred (apart from its exclusive appearance in the 'Amazon Underworld' series). For this mode, an important digital affordance in the ISDoc is the possibility for users to hover over key words in the text and obtain simplified explanations without the need for exiting towards other webpages or search engines (Figure C.2.3). The 'Photographic / Audiovisual evidence' semiotic mode makes limited use of the interactive affordances of the site, seeing their functionality reduced to allowing users to control the flow of photographs at their own pace. Videos do not offer a play/pause option, and external videos (from YouTube) provide their native platform's functionalities. On their part, 'Data visualisation' in *InfoAmazonia* fully exploits the interactive potential of this digital database.

Their interactive instances allow users up to three possibilities. The first is to either syntagmatically scroll through the contents of animated, built-in visualisations, or click / hover over key information. The second is to highlight and provide in-depth explanations of such information, offering internal and external links to source data, methodology, or other publishing sources (such as partner digital journals). The third is to provide remediated scientific information through simplified graphs, iconic and indexical relation to the signified, and captions and pop-ups explaining the calculations. Finally, the semiotic mode of 'Cartography' does also capitalise on the interactive affordances of the web in order to display and interconnect different data. Users are allowed control of the semiotic mode, especially in the 'Discovery' tab, where all the data gathered in the platform is uploaded into an interface which allows combining stories and layers. Nonetheless, users can also access smaller versions of it in the 'Maps' tab. This sub-site serves as a remediated / reduced version of the 'Discovery', so the interactive affordances are limited to offer users a reduced range of options and simplified captions. When

built in 'Long forms', the semiotic mode further reduces interactive possibilities to syntagmatic scrolling and salient ways to represent the relation between text and highlighted areas in the map (Figure C.2.10).

C2.1.2. IDN structure

C2.1.2.1.- Interactive Sites/Signs

ISS within *InfoAmazonia* greatly vary in their form and effect aspects. Actions are reduced to those most used in webpage navigation: scrolling, hovering, and clicking with the mouse (arrow navigation is not supported). From that point of departure, the classification of ISS within the platform can be established by examining the presence of ISS through all of the webpage's instances and associated sub-genres (as realised through semiotic modes, such as 'Cartography' and 'Data visualisation'). This yields the following taxonomy: (1) ISS that are located in all instances and sub-genres (such as 'News'); (2) ISS that are not genre-specific in its ideational level but are constrained to specific sub-genres; and (3) genre-specific ISS.

ISS in category 1 can be seen in Figures C.2.12 and C.2.13 and can be further subdivided depending on the most prominent metafunction they enact. First, the 'Content' mainly serves a textual function, by which all the contents of *InfoAmazonia* can be filtered and grouped. The ISS are formally different in Header and footer, but the Given – New relation they establish with the contents is regularly maintained in all their instances. The second type of ISS in category 1 enacts the interpersonal metafunction. The SNS icons imply that directionality is user-centred, which contrasts with the 'Institutional' SNS and their author-centred directionality. In a typical fashion, SNS are formally represented with their source icons. Finally, scrolling through the platform triggers the location of category 1 ISS to the prototypical pop-up sidebar menu, represented through three parallel horizontal lines (Figure C.2.14). Apart from offering distinctive animations upon hovering, they include an additional ISS ('More') enacting a particular metafunction, namely modifying the platform's layout (font size and dark / bright

theme), which implies that directionality is shaped towards users by pinpointing accessibility as a key UI design factor in the webpage.

Figure C. 2.12
Header with category 1 ISS in the platform

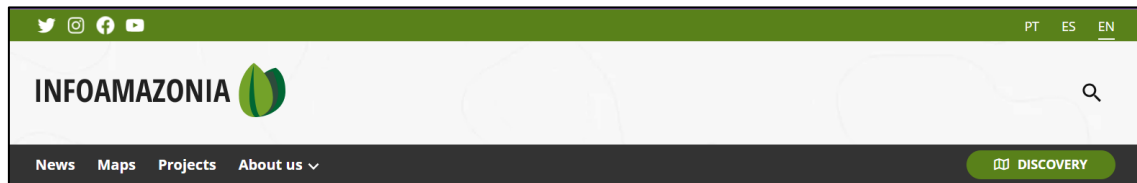


Figure C. 2.13
Footer with category 1 ISS in the platform

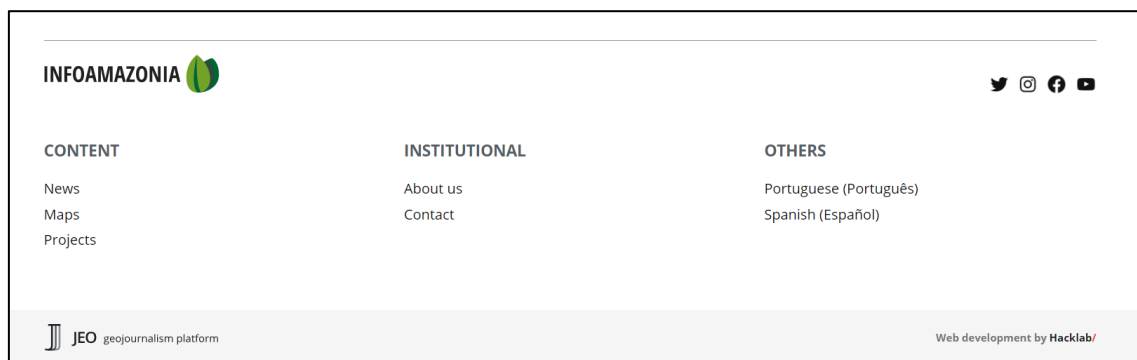
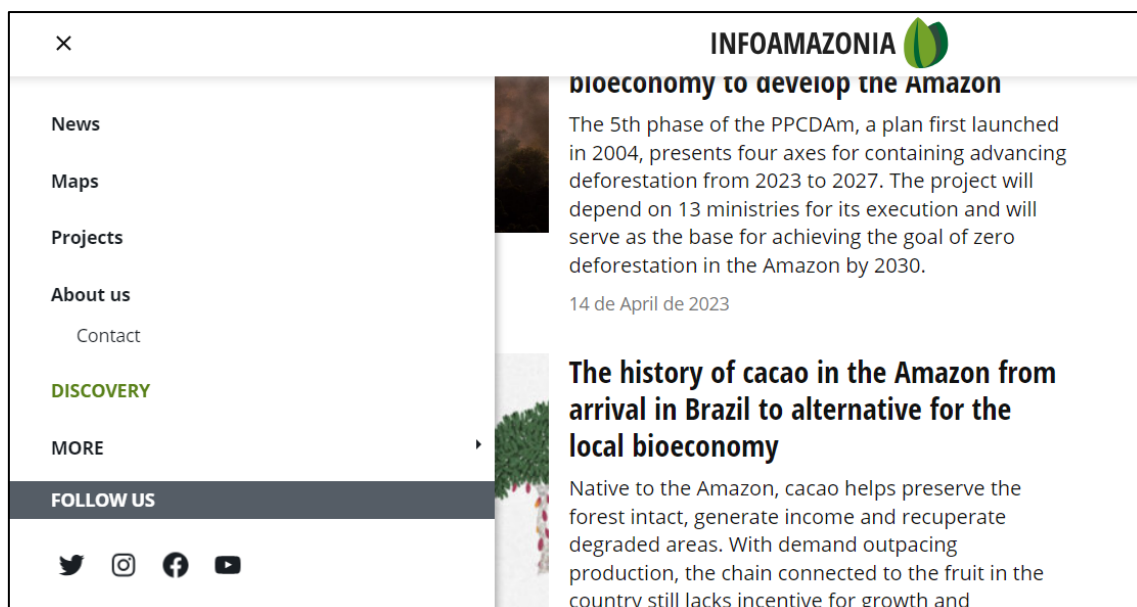


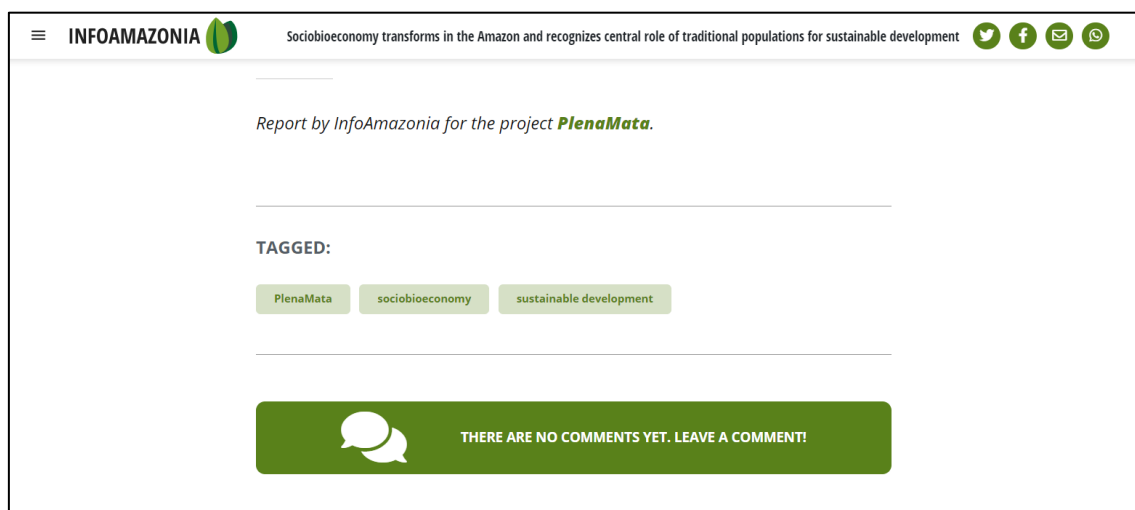
Figure C. 2.14
Sidebar with category 1 ISS in the platform



Category 2 includes those ISS whose metafunctions and contribution to the social action of the genre are regular and uniform in comparison with other digital

genres; but which in *InfoAmazonia* they come to appear only in specific sites. For instance, textual hyperlinking is a common ISS in websites and whose ideational level (in both its syntagmatic and paradigmatic dimensions) is generally understood: the traditional underlined and coloured piece of information leads to external sites with related information. While there should be no apparent restrictions in its usage, these ISS only appear in *InfoAmazonia* in the ‘News’ subgenre; and, more specifically, not in the ‘Cartography’ and ‘Data visualisation’ semiotic modes. The other instance of this happening groups the traditional news’ footer section (Figure C.2.15). In *InfoAmazonia*, these footers include the hyperlinking to contributing sites (such as journals, non-profit organisations, or educational institutions; the ‘Tagged’ section with distinctive ISS which, in their textual dimension, serve to categorise contents across the platform; and the ‘Comment’ section, which shapes directionality towards users. Once again, while there should be no restrictions to its uniform usage across the platform and the ISS enact the participatory nature of digital archives such as *InfoAmazonia*, its appearance is restricted to texts within the ‘News’ section (and the ‘Project’ section eliding the ISSs associated with the ‘Comment’ segment).

Figure C. 2.15
Footer section with Category 2 ISS in ‘News’



Lastly, category 3 groups ISS that are specific to certain semiotic modes in the platform. As already mentioned, the actions required to paradigmatically interact with the ISS are reduced to few clicking and scrolling options. Nonetheless, the

platform makes full use of these actions and forms to display different informational arrangements. As for the ideational and textual functions, Category 3 in the 'News' section includes clickable ISS which slightly modify map contents upon clicking (Figure C.2.16), legend pop-ups that trigger upon hovering on the Data visualisation semiotic mode (Figure C.2.17), photographic reels that appear after clicking on certain ISS in 'Data visualisation' (as shown in Figure C.2.8, Before; Figure C.2.18, After), or sliding bars that are activated upon clicking and dragging (as shown in Figure C.2.5).

Figure C. 2.16

Clickable ISS that alter contents of 'Cartography' semiotic mode

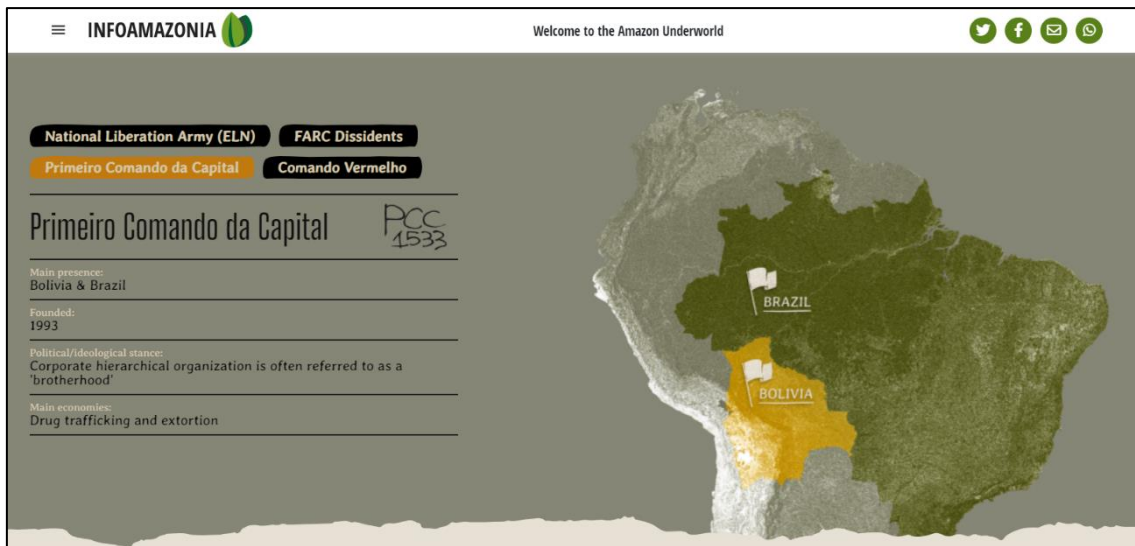


Figure C. 2.17

Legend pop-ups in 'Data visualisation' (hovering action)

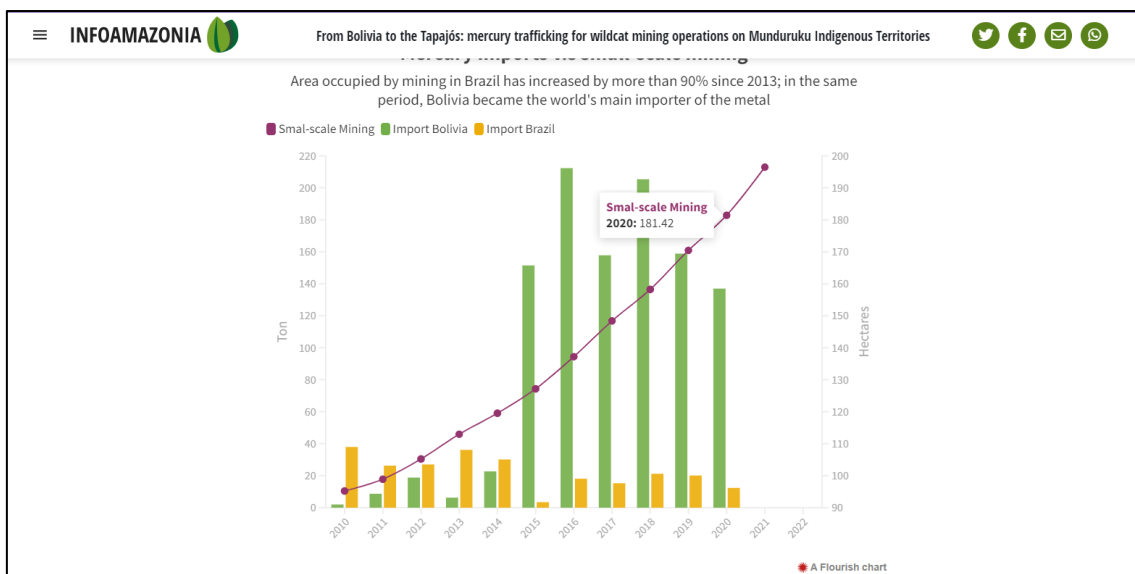
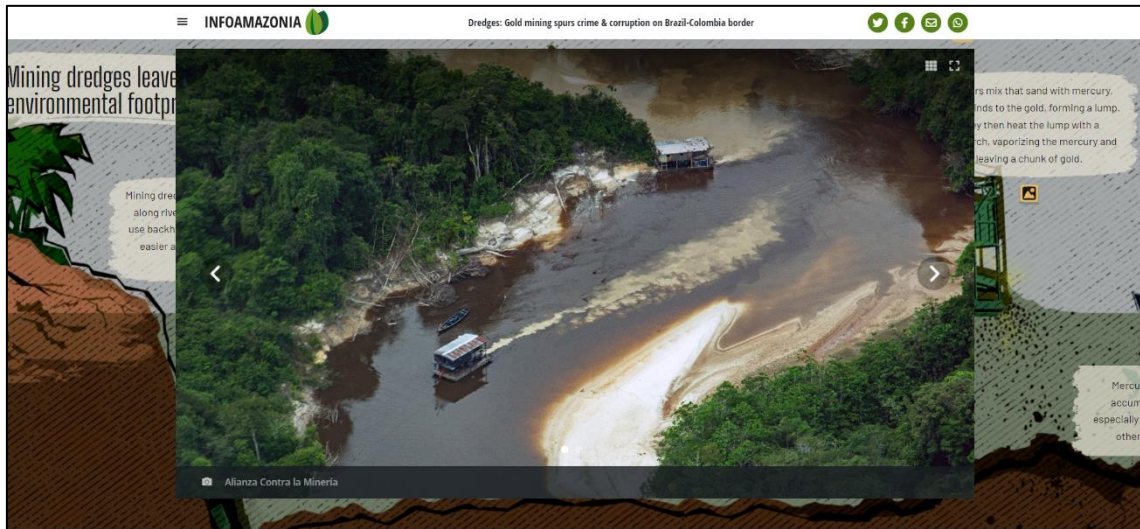


Figure C. 2.18

Photographic reel embedded in 'Data visualisation' semiotic mode



Interactive 'Cartography' in the 'Maps' section encompasses the use of ISS that allow for navigation through the maps and, harnessing the affordances of the digital medium, expand the resources that are available to users. Figures C.2.19 to 21 are an example of the sequential before-after relations enabled by the ISS, and which reduce users' possibilities for interaction. In Figure C.2.19, users access an interactive map depicting Amazonian mangroves. At this stage, ISS are reduced to (1) zooming, (2) the 'Conservation units' legend checkbox, and (3) an 'Info' ISS. Interacting with the latter ISS (Figure C.2.20) triggers further ISS which redirect users towards associated sub-sites (with source data). At last, the ISS legend checkbox (Figure C.2.21) enables the display of additional map layers (coloured in orange) and the possibility for users of hovering over the map and obtaining more information through white pop-ups.

Figure C. 2.19
Base interactive ‘Cartography’ semiotic mode and ISS in ‘Maps’



Figure C. 2.20
Interaction on ‘Info’ ISS: associated ISS and redirection towards other sites

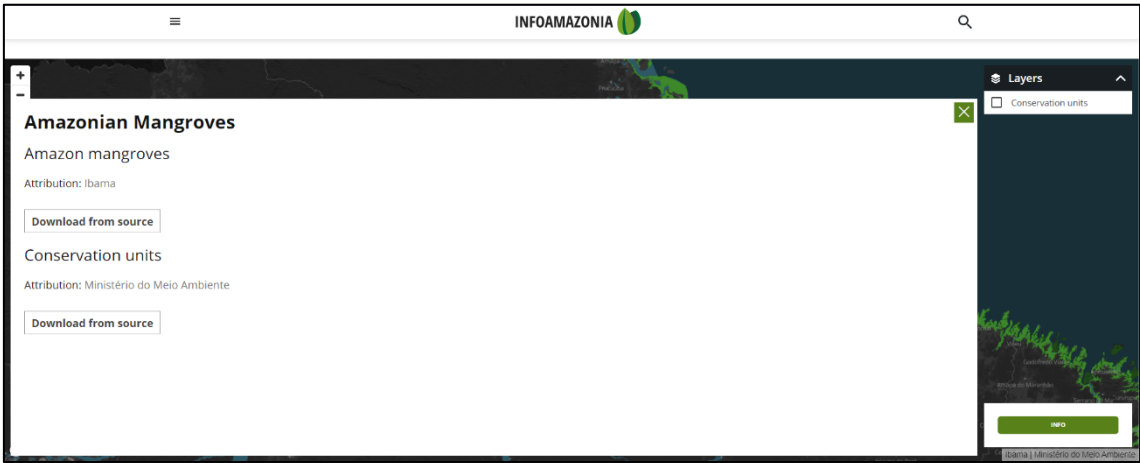
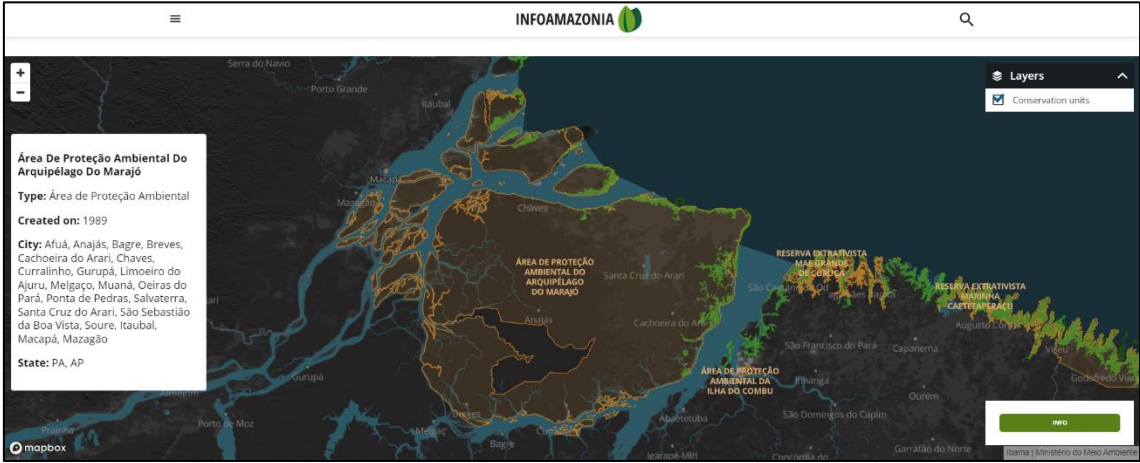


Figure C. 2.21
Interaction on ‘Layers’ ISS: associated ISS and expansion of map contents

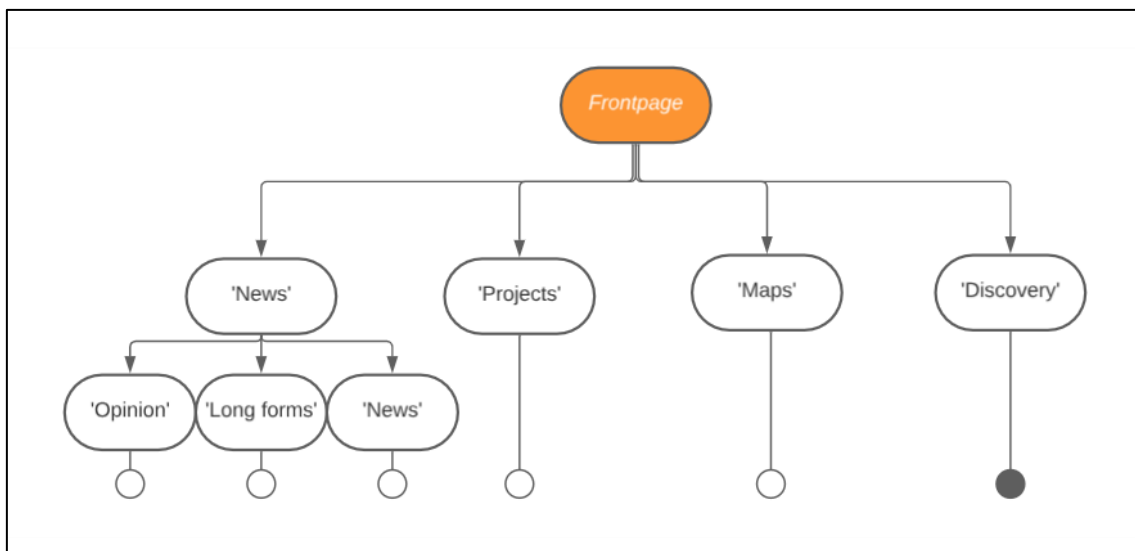


C2.1.2.2.- Interactive Digital Narrative design (Protostory design)

The narrative design of ISDocs such as *InfoAmazonia* is based on the principles of the 'trim bin database' (Manovich, 2002, 2014). All the semiotic modes or genres and sub-genres appear in the ISDoc as 'fragments' that can be assembled into a larger documentary form. In spite of this, pinpointing the layout and navigation similarities between the ISDoc and any other traditional news website may challenge *InfoAmazonia*'s status as an ISDoc. What is the narrative about *InfoAmazonia* that makes it 'documentary'?

The question is misleading in that it only partially addresses a component of what makes IDNs 'serial' or 'narrative'. Such view for the *InfoAmazonia*'s system would then be restricted to the rendition in the following chart (Figure C.2.22). In the figure, white-end connectors represent potential access to different text, and the black-end connector represents access to one text.

Figure C. 2.22
Overview of InfoAmazonia as System

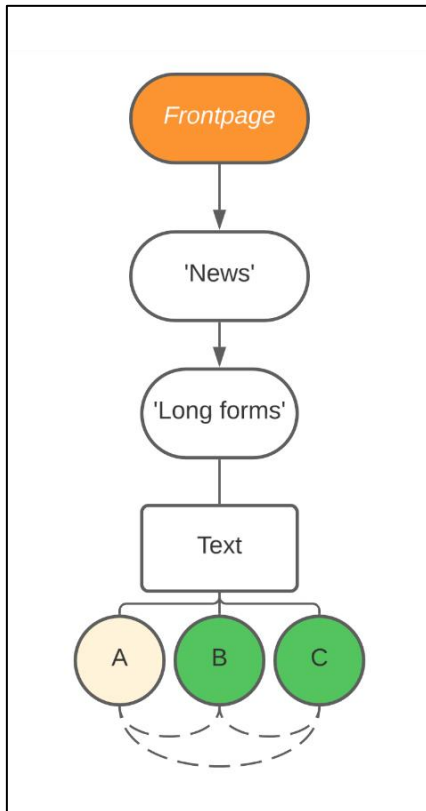


On the grounds of hypersemiosis, nonetheless, navigational aspects (which, as Figure C.2.22 represents, are limited to navigation across few overarching categories and their texts), should meet other variables in order to understand the full process of how users make sense of the content of *InfoAmazonia*. The instantiation of the system must be performed under two optics: the first one, by accessing the texts as individual fragments and examining the wider navigational

connections that the platform harnesses (*textual* relation); the second one, by examining how the semiotic modes interact with each other *ideationally* – that is, by displaying contents which are topically (and navigationally) related.

The suggested instantiation could start by accessing the ‘News’ category. Texts within the ‘News’ category may at first seem not different to accessing news websites, since ISS (navigation; hyperlinking, see section 1.1.1; and tagging, see Figure C.2.15) are identical. Texts under the ‘Opinion’ and ‘News’ tag exhibit similar characteristics in terms of ISS use. It could be argued that ‘Long form’ texts follow the same pattern, but that would only fit a *textual* classification. As exposed in this case’s previous sections, ‘Long forms’ correspond to texts which, apart from featuring longer instances of the ‘Written evidence’ semiotic mode, also more readily incorporate instances of other semiotic modes. As a result, interaction upon these semiotic modes is paradigmatic, since it is not mandatory to explore the totality of the discourse semantics of the modes in order to understand its role within the text. Nonetheless, regarding hypersemiosis, this interactive ‘depth’ implies that a navigation switch will occur if users meaningfully interact with the semiotic mode. To picture this: users navigate the ‘Written evidence’ mode (syntagmatic, represented as ‘A’ in the following figures) when they encounter an embedded ‘Cartography’ mode (represented as ‘B’). If they opt for interacting with the mode, the way in which contents are accessed through ISS changes: it will require different actions, which may even be sequenced (see Figures C.2.19-20-21). From this sequence, then, while there exist *textual* differences in the navigation of the modes within a single text, in the *ideational* level the modes are connected: the topic and subject matter of the different modes will remain the same (Figure C.2.23).

Figure C. 2.23
Instantiation of InfoAmazonia 'News' 1

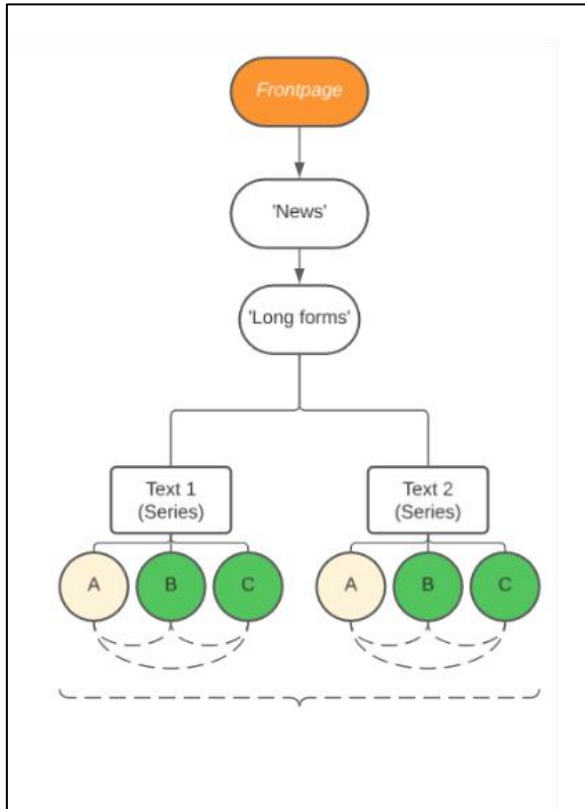


Note. Semiotic modes (A, B, C) are not textually (solid line), but ideationally (dashed line), connected

The implications of this sequence are amplified in the serialised 'Long form' texts. Since 'Long form' series are based on unifying topics (for instance, the natural degradation of the Amazon stemming from drug wars) and distinctive, salient representations of the semiotic modes (see section 1.1.1: modifications in expressive resources and material substrate), it could be argued that there is a further level of *ideational* connection between not-*textually*-connected semiotic modes. The presence of 'introductory' texts (for example, 'Welcome to the Amazon Underworld') also ties the string of serialised texts together. It serves to (1) present the *textual* arrangement of the semiotic modes and introduce the upcoming actions that users will need to take to interact with them, and (2) *ideationally* provide an encapsulated view of all the topics that will be subsequently serialised

(see Figure C.2.24). In this figure, the connection between Text 1 and Text 2 is also established through the aforementioned ‘introductory texts’, but not represented.

Figure C. 2.24
Instantiation of InfoAmazonia ‘News’ 2



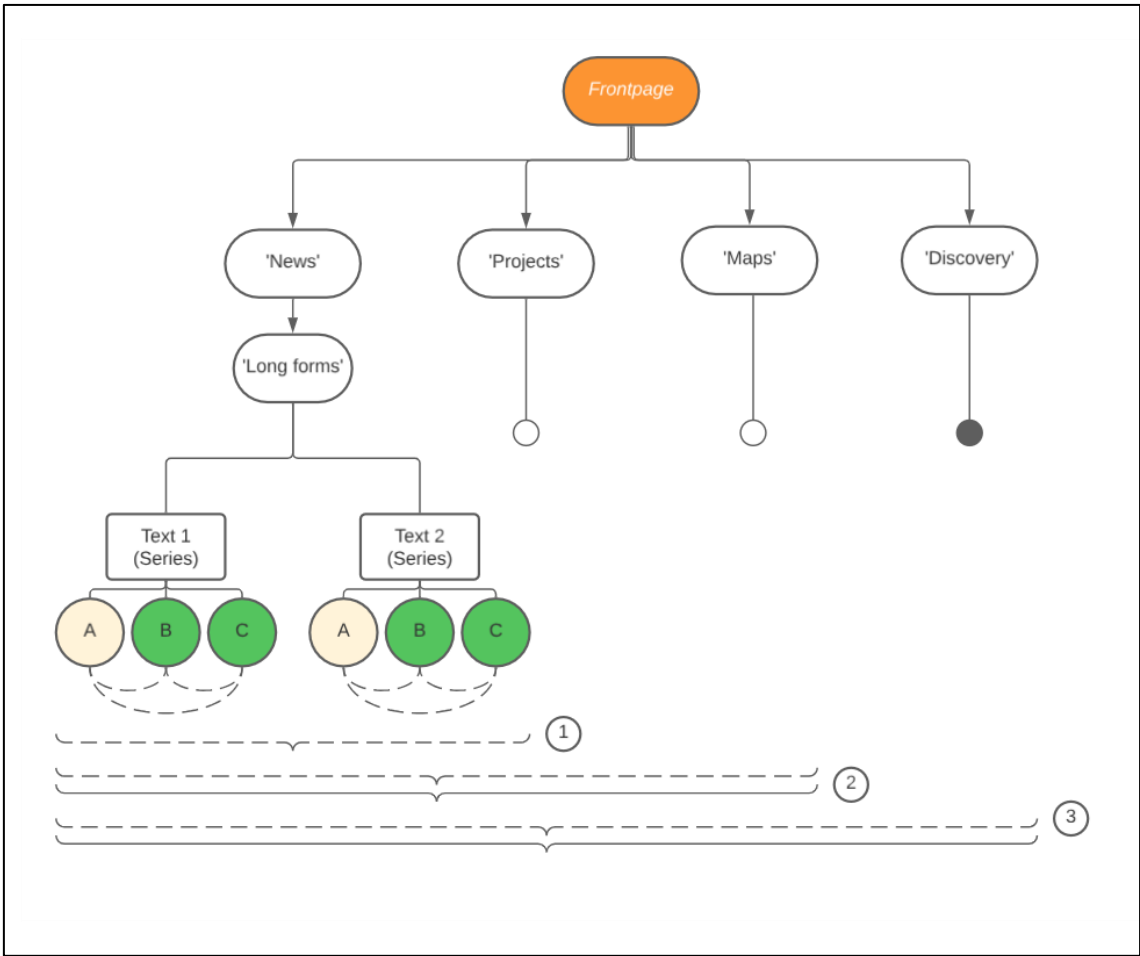
Note. Semiotic modes (A, B, C) are ideationally (dashed line below) connected across texts.

In this sense, and ultimately, semiotic modes in the individual texts configure complex relations with other modes across the platform based on the open-source guiding principle of *InfoAmazonia*. This interweaving of modes is represented in Figure C.2.25. Apart from the relation that paradigmatic and syntagmatic semiotic modes establish in the ‘Long form Text’ series (Level 1 in the chart), the former are usually located in the ‘Projects’ and ‘Maps’ categories. As represented in Level 2 in the chart, these paradigmatic semiotic modes (‘Data visualisation’ and ‘Cartography’, mostly) are *ideationally* connected to the modes contained in the aforementioned categories: the ‘Projects’ category contains tools that provide access to external and internal sources of data, while the ‘Maps’ category collects and classifies maps depending on the news they are associated with. Accordingly,

these modes also establish a *textual* relation, by which specific hyperlinking across the texts might appear. Finally, all these contents are mapped out in the 'Discovery' category (Level 3), which ideationally ties all the contents of the platform in the general map of the Amazon (ideational level) and whose filter section allows establishing hyperlinked connections to texts of different categories (textual level).

The combination of both textual and ideational relations that interrelate the different semiotic modes thus confers it the status of IDN. Non-linearity and granularity constitute the base principles of this database documentary, and the webpage design favours the paradigmatic realisation of semiotic modes by including more interactive options. Consequently, if interacted upon, the hypersemiosis process in which users engage involves switching across browsing and navigation stances in a completely free way and, ultimately, the provision of sequentiality upon texts and semiotic modes from different sources and categories.

Figure C. 2.25
Instantiation of InfoAmazonia: ideational and textual relations of semiotic modes with the platform's categories



C2.2. SCIENTIFIC CONTENTS AND LEGITIMATION OF SOCIAL ACTION

C2.2.1 Documentary Contract Clause 1: Truth and Reality

Semiotic modes in *InfoAmazonia* fulfil the following narrative modes (see Table C.2.3):

Table C. 2.3*Semiotic modes and narrative modes in InfoAmazonia*

Semiotic mode	Narrative mode
Written evidence	Expository + Reconstructive + Explanatory + Speculative
Photographic / Audiovisual evidence	Expository + Reconstructive + Explanatory
Data visualisation	Expository + Reconstructive + Speculative
Cartography	Expository + Reconstructive + Speculative

In *InfoAmazonia* the semiotic mode of ‘Written evidence’ deploys all the narrative styles mainly across the different ‘News’ categories. As explained in Chapter 4, the ISDoc’s ‘Expository’ mode is concerned with providing audiences with material (scientific or not) which is decoded as factual within the documentary’s narrative. In the case of *InfoAmazonia*’s ‘Written evidence’, the goal is fulfilled in a typical news webpage manner. Nonetheless, what is particular about *InfoAmazonia* is that texts exhibit the combination of this narrative mode together with others, likely reinforcing the narrative aim of the ISDoc. A sample of the combination of ‘Expository’ and ‘Reconstructive’ mode is as follows, in which the narration of witnesses / participants is merged with the ‘Expository’ and factual reporting about the Burareiro region:

“We were walking along the road and all of a sudden, some people started coming out of the bush and appearing in cars and motorcycles. They surrounded us and said we were on private property. I told them it was Indigenous land, and they knew it.” That is how Indigenous peoples’ rights advocate Ivaneide Bandeira described the moments of tension she faced together with some Uru-Eu-Wau-Wau on Mother’s Day, Sunday, May 14. [...] The confrontation took place in an area of Rondônia’s Uru-Eu-Wau-Wau Indigenous Land known as Burareiro — a Brazilian Amazon region where encroachers have cattle ranches that supply large meatpacking companies and supermarket chains. (Bispo, 2023)

This is a common procedure that *InfoAmazonia* deploys in many texts within the ‘News’ category. The ‘Reconstructive’ mode not only works by directly quoting witnesses (the most typical reporting news technique), but also by providing specific details to their lifestyle and habits by the time the reported happenings took place. This is specifically recurring in Long form News (and series such as Amazon Underworld), where the description of local communities provides the setting where the Amazon’s environmental and social issues end up impacting:

It’s Friday night, and in the center of Ikabarú, a community in the Pemón Indigenous territory in the southern Venezuelan Amazon, the preaching of a couple of Christian pastors brings back bad memories to local residents. The scene, the hustle and bustle, and the singsong voices are similar to those of the days before the so-called Ikabarú massacre, an armed operation three years ago in which eight people were killed. The event — on the night of Friday, Nov. 22, 2019 — signaled the importance of the Indigenous territory for criminals involved in illegal gold mining in this vast area of southern Venezuela and neighboring countries. (Ramírez Cabello, 2023)

True to the scientific inclination of the agents behind *InfoAmazonia*, the ‘Expository’ mode coalesces with the explanatory style in texts such as the following, where narration meets a nearly academic reporting style (especially remarkable in the last sentences of the text):

The sky was dark and only the moon lit the way when biologist Martin Acosta, from the Federal University of Acre (UFAC), left a settlement in the vicinity of Rio Branco for the middle of the forest. It was 2:30 in the morning and Acosta was accompanied by three other colleagues. They’re the ones who helped him on his mission to climb some of the tallest trees in the Amazon in order to collect samples to be used for scientific research. This routine, which was repeated dozens of times in 2017, is just one part of the extensive study, led by Brazil’s own Julia Tavares, published in late April of this year in the journal “Nature.” [...] The objective was to understand how the different regions of the forest respond to periods of drought, which are expected to become increasingly frequent and longer-

lasting due to climate change. The study showed that the western and southern regions of the Amazon are less likely to withstand periods of low rainfall. (Figueiredo, 2023)

While the previously mentioned ‘Reconstructive’ and ‘Explanatory’ modes typically work together with the ‘Expository’ in the legitimization of the evidentiary nature of the ISDoc, *InfoAmazonia* also merges the latter with the ‘Speculative’ mode. This may contravene the evidentiary nature of some texts. Rather, when this combination appears in the ‘News’ text under the ‘Opinion’ tag, it is usually based on the provision of factual information (including indirect quoting), data, or other semiotic mode with claims to factuality. This is what happens in the excerpt below, where the reporter combines both an ‘Explanatory’ mode (evidenced in the explanation of the climate forecast agencies) and a ‘Speculative’ mode (it could be argued that even the ‘Reconstructive’) together with a map (‘Cartography’ semiotic mode) and hyperlinks, which together support the validity of his claim:

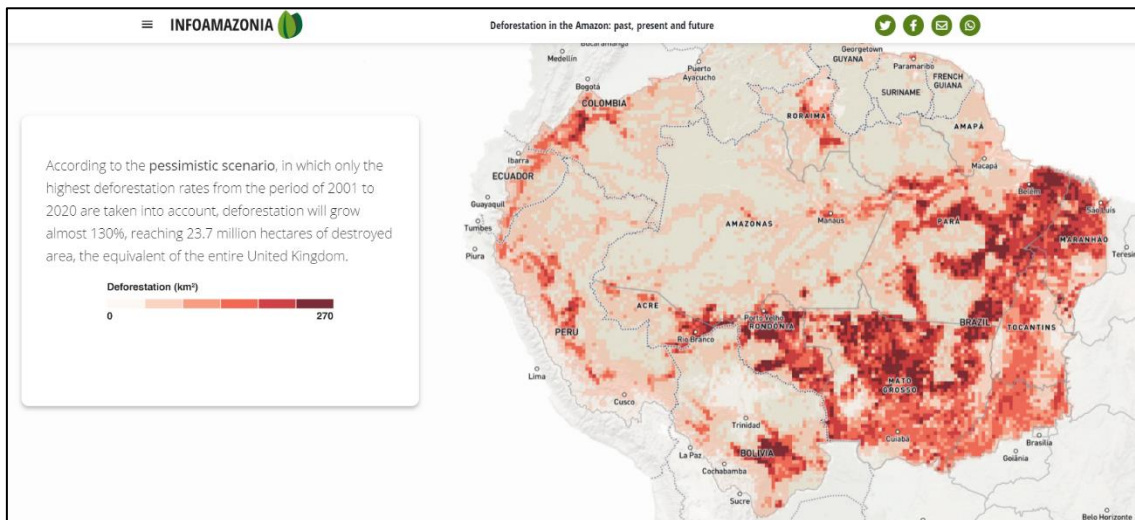
We knew that the drought was already at an advanced stage in the upper Solimões and Rio Negro rivers, but it has now clearly gained strength in the easternmost part of the Amazon. In the climate forecast for the next three months, INPE’s CPTEC indicates that it is precisely this central part of Pará where the greatest anomalies are expected, with rainfall well below normal. I bet that if asked about the high number of fires in the Amazon, the government officials on duty would say that it was a year of extreme drought and that they had been taken by surprise. It’s always like that, to get themselves off the hook. This was the model adopted by the then governor of São Paulo, Geraldo Alckmin, in 2016, when the water dried up in the Cantareira System, the main supply for the biggest metropolis in South America. (Faleiros, 2023)

The presence of the speculative style is extended to other semiotic modes that, in principle, convey factuality. The ‘Cartography’ semiotic mode supports the claims made in the ‘News’ reports by providing locations from open-sourced platforms (see sites such as TerraBrasilis for data about deforestation). As seen in this section, they enact the ‘Reconstructive’ and ‘Expository’ mode, depicting the current state

of specific areas ('Expository', Figure C.2.21), or showcasing the evolution of the Amazon area ('Reconstructive', Figure C.2.11). More than that, this semiotic mode also enacts the speculative narrative mode by displaying expected projections of the issues that afflict the Amazon. For instance, Figure C.2.26 shows the pessimistic scenario for the deforestation rate until 2025.

Figure C. 2.26

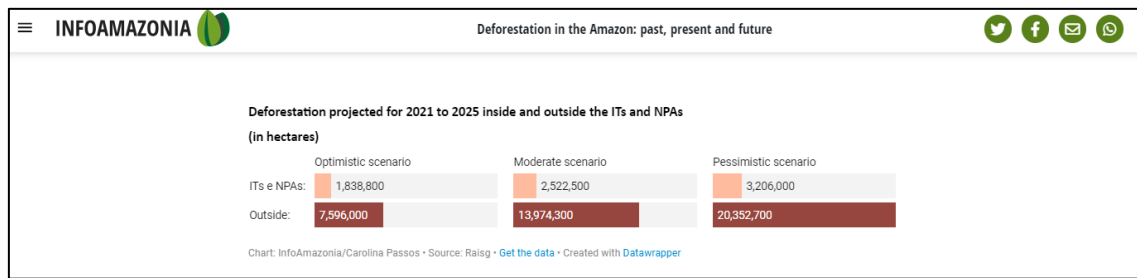
'Cartography' semiotic mode: 'Speculative' narrative mode



In a similar manner, the 'Data visualisation' semiotic mode includes similar narrative styles which include factual information: the 'Expository' and the 'Reconstructive' provide a comparative overview of data trends in a diachronic or current manner (see Figures C.2.6, C.2.9, and C.2.17). However, it also explores the potential in these data trends, thus enacting the 'Speculative' narrative mode. Figure C.2.27 (related to Figure C.2.26) presents the estimated deforestation rate for Indigenous Territories (ITs) and Protected Natural Areas (PNAs). It is noteworthy that, whenever the 'Speculative' mode is deployed, another semiotic mode appears and provides a factual anchor that legitimates the ISDoc.

Figure C. 2.27

Data visualisation semiotic mode: ‘Speculative’ narrative mode



Finally, the ‘Photographic / Audiovisual evidence’ typically enacts the ‘Expository’ and ‘Reconstructive’ mode (as seen previously in e.g., Figures C.2.4 and C.2.18), but *InfoAmazonia* also introduces the ‘Explanatory’ mode in different ways. Figure C.2.28 shows the use of the ‘Explanatory’ narrative mode in a didactic way. It serves to illustrate different cocoa varieties with minimal and summarised information, thus illustrating the meaning conveyed by the verbal mode and facilitating understanding of this meaning for non-expert audiences. Figure C.2.29 displays the cover of the *Science* journal, thus signalling the relation of their investigation with academic and research procedures. In the last place, Figure C.2.30 corresponds to Van Dijk’s definition of the mode as ‘this is how science works’ in an original manner: it presents the necessary logistics to carry out research, thus redirecting directionality towards the human, not the target object, side of science.

Figure C. 2.28

‘Photographic / Audiovisual evidence’ semiotic mode: ‘Explanatory’ narrative mode (remediated materials)

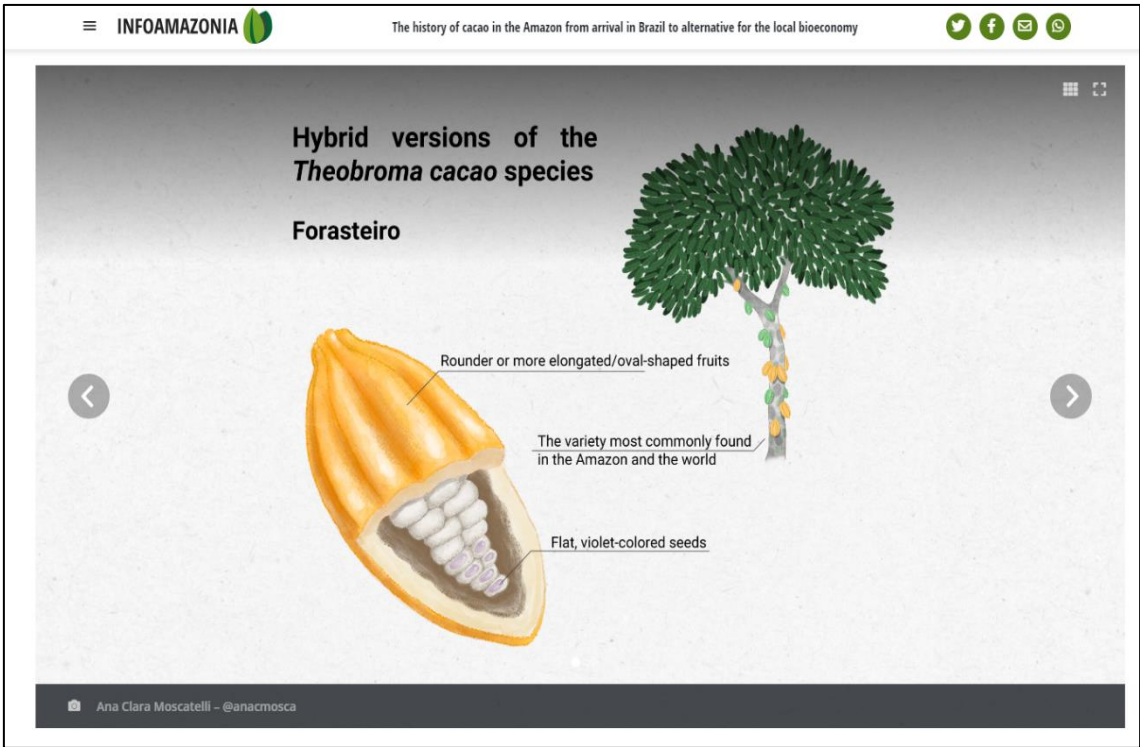


Figure C. 2.29

‘Photographic / Audiovisual evidence’ semiotic mode: ‘Explanatory’ narrative mode (relation research – academia)

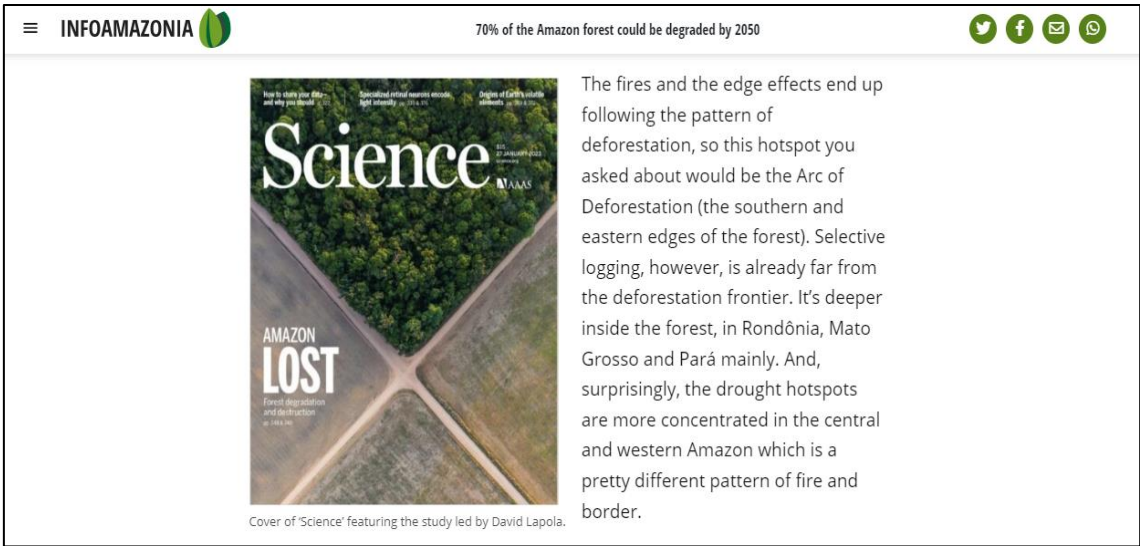
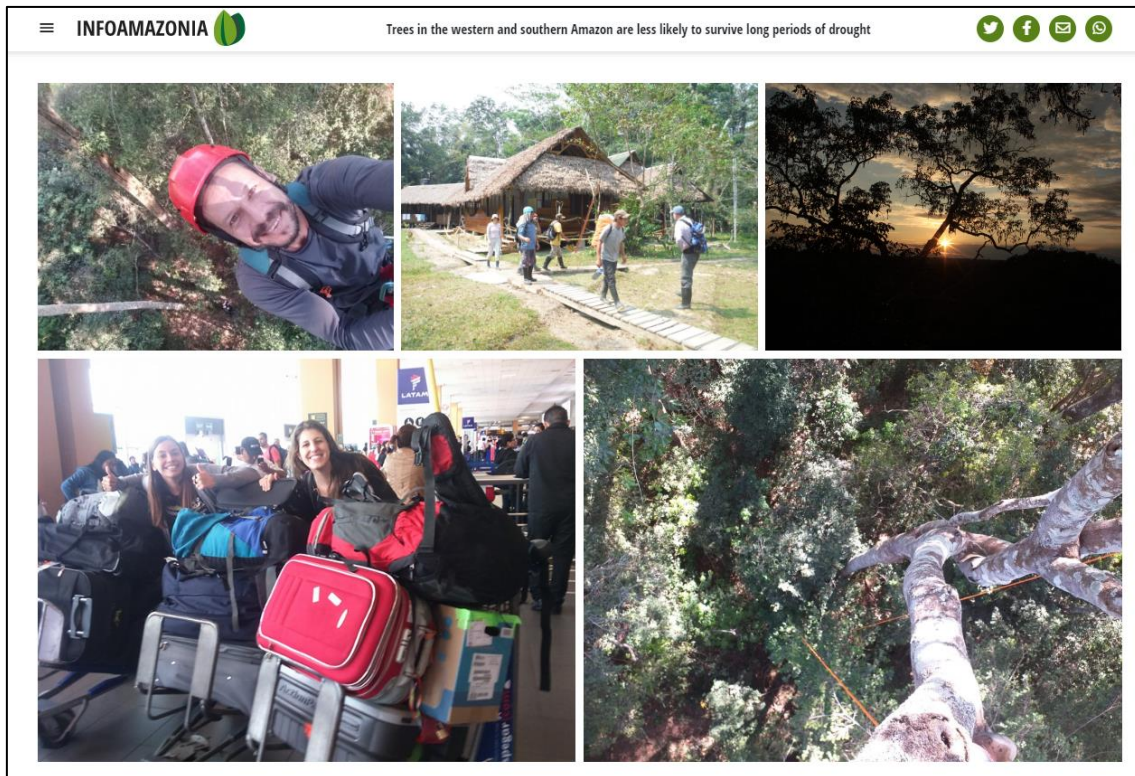


Figure C. 2.30

'Photographic / Audiovisual evidence' semiotic mode: 'Explanatory' narrative mode (external components to research)



C2.2.2 Documentary Contract Clause 2: Taking action and Edifying actively

As a point of departure, it can be stated that the granular organisation of *InfoAmazonia* implies an increased effort on the part of users to make sense of the documentary's contents. As section 1.2.2 explains, the hypersemiotic process experienced in the platform involves the switching stances between browsing and navigation in the weaving together of the narrative fragments. These narrative fragments, at first sight independent and reminiscent of prototypical news webpages, end up conforming a net of relations which is based not only on the textual, but also the ideational relation that ties them together. In other words, more than the hyperlinked arrangement, the centripetal generic force that binds *InfoAmazonia* as a unified documentary is the relation of contents established in the platform across different semiotic modes.

This thesis posits that interactivity with the digital platform implies the enactment of the 'Taking action' clause, and more so for the documentary genre. In this sense, and following the design of the webpage, *InfoAmazonia* seemingly favours

paradigmatic interaction in order to experience and visit all contents of the documentary. In fact, it can be argued that, without paradigmatically interacting, *InfoAmazonia* ceases to be documentary and is merely a collection of texts with included digital features for visualisation and navigation.

Paradigmatic interaction with *InfoAmazonia* involves, as previously seen, exploring the 'depth' of the embedded semiotic modes within the Written Evidence-based texts. The switch between browsing and navigation stances abruptly occurs when the interactive actions required to activate paradigmatic ISS 'transport' users to a different way of accessing (and making) meaning than simply reading through the webpage. Subsequently, this exploration of text-embedded semiotic modes leads to its ideational and textual connection to other similar instances located in the webpage. As in the case of specific maps located in 'Long form' texts which are then re-classified and merged into the 'Projects' and 'Discovery' categories, *InfoAmazonia's* design is crafted in such a way that open-sourced data and tools are fully accessible to users throughout the full process. Exploring not only these contents, but also the connections that tie them demands a higher hypersemiotic effort on *InfoAmazonia* users. Nevertheless, and ultimately, the platform carefully creates a balance at the same time between remediation and picking-up of both content and digital research skills that truly enacts the documentaries' social action for taking action and actively edifying knowledge.

CASE STUDY 3: *BEHIND THE DIRTY GOLD*

C3.1. HYPERSEMIOTIC STRUCTURE

C3.1.1. Semiotic modes in interactive contexts

C3.1.1.1.- Semiotic modes

Behind the Dirty Gold documents the travel through South America to find the social and environmental effects of gold extraction. The ISDoc showcases 4 different semiotic modes, as shown in Table C3.1.

Table C. 3.1

Semiotic modes in Behind the Dirty Gold

Semiotic mode	Embedded genre	Interactivity	Expressive resources and material substrate
Audiovisual / cinematic presentation / narration	No	Yes	<ul style="list-style-type: none"> • Video, allows syntagmatic interaction on reproduction, cuts and scenes • Written text (captions), optional, no interaction, associated with [Spoken narration] • Written text (narration): allows interactivity (optional), distinctive ISS • Interview simulation: allows interactivity, distinctive ISS • Mobile message simulation: does not allow interactivity • Spoken narration, optional, static reproduction • Optional music in the background
Written evidence	No	No	<ul style="list-style-type: none"> • Similar material substrate in combination with to 'Audiovisual narration' semiotic mode • Different material substrate when in independent sections
Photographic evidence	Yes	Variable	<ul style="list-style-type: none"> • Present in interactive and non-interactive form • Written text (captions)
Cartography	No	Variable	<ul style="list-style-type: none"> • Present in interactive and non-interactive form • Static images

The main semiotic mode featured in the ISDoc is the 'Audiovisual narration', which, as the table shows, may manifest different variations and combinations in terms of expressive resources and discourse semantics involved. The most common materialisation of this semiotic mode involves the combination of (1) video scenes featuring different agents / interviewees and (2) the captions (written text) that accompanies their speeches. Usually, the people involved in the interviews are also identified by means of distinctive text tabs (Figure C3.1). Interactive possibilities are reduced to a minimum for this ensemble: the play/pause, 'Go Back' and 'Skip' are the only ISS that users can interact with to control the pace of narration.

Figure C. 3.1

Semiotic mode of 'Audiovisual narration'



Note. Combination of video, written captions supporting speech (yellow), and text tabs (black and red).

An also common materialisation of the semiotic mode is the (3) narration that only appears in written form. What is particular about the use of this materialisation in *Behind the Dirty Gold* is the many functions and combinations it comes to play in the ISDoc. As Figure C.3.2 represents, written narration usually appears joining the video narration in a distinctive shape within a black box. Discursively, this type of narration provides context for the overall trip that the ISDoc tries to simulate.

Nonetheless, and as part of the immersive strategies deployed in the ISDoc, and more than narrating or setting context / background (communicative functions that can co-occur), utterances featured in these written narrations directly address the users by means of second person pronouns, and present-tense and imperative verbs (Figure C3.3). The rhetorical implications of this occurrence in relation to the overall social action of the genre will be expanded in the final section of this case study. At this stage of the analysis, what is remarkable is that one of the manifestations of the 'Audiovisual narration' semiotic mode demonstrates regular variations at the level of discourse semantics (which, as Bateman posits, are 'structural configurations' that are to be correlated with its 'contextual interpretation'; 2017, p. 8). Finally, this combination of expressive resources in the ISDoc features ISS for different narrative choices or paths, thus allowing users' manipulation of the order of contents in the database (Figure C3.4).

Figure C. 3.2

Semiotic mode of 'Audiovisual narration'



Note. Combination of video and written narration (black tabs). Provision of context to the narration.

Figure C. 3.3

Semiotic mode of 'Audiovisual narration'



Note. Combination of video and written narration (black tabs). Addressing users (and provision of context).

Figure C. 3.4

Semiotic mode of 'Audiovisual narration'



Note. Combination of video and written narration (black tabs). Narrative choices.

As part of the ISDocs discursive strategies for immersion, two additional manifestations of the 'Audiovisual narration' semiotic mode can be pinpointed. The (4) simulation of interviews is a regular strategy through the ISDoc, by which users adopt a (limited) role as journalists enquiring different agents about the gold-related issues in their countries. These interviews offer limited opportunities for users to access information (depending on the questions) and can be skipped (Figure C3.5). The second strategy concerns the use of (5) simulations of mobile messages, by which a distinctive green box appears during the video narration and replicates a text message from different agents (Figure C3.6).

Figure C. 3.5

Semiotic mode of 'Audiovisual narration': interview simulation



Figure C. 3.6

Semiotic mode of 'Audiovisual narration': mobile message simulation



An important clarification should be provided at this stage. While the interview and message simulations are indeed arrangements of semiotic resources that can work independently outside this case ISDoc, what impedes its labelling as independent semiotic modes is the function they enact in *Behind the Dirty Gold*: the simulations in the ISDoc do not fulfil the same communicative functions as the other semiotic modes. This phenomenon will be developed in more depth in the next chapter; for the moment, it serves as a departing point for classifying what counts as semiotic modes and what counts as instantiations of a specific semiotic mode.

Similar issues to be explored in Chapter 6 concern the classification of some materialities that belong to the 'Written evidence' mode. The 'Written evidence' mode in this ISDoc relies on similar combinations of these materialities: in spite of video evidence not being used, manifestations of the semiotic mode can include the usual black tab – white text pop-up which appear during the narration in the right part of the screen (Figure C3.7). As shown in Figure C3.8, another instantiation of the mode includes the 'Glossary' section (to be mapped in further sections of this analysis), which groups several keywords or concepts that require further explanation, such as acronyms or jargon.

Figure C. 3.7

Semiotic mode of 'Written evidence': remediating information

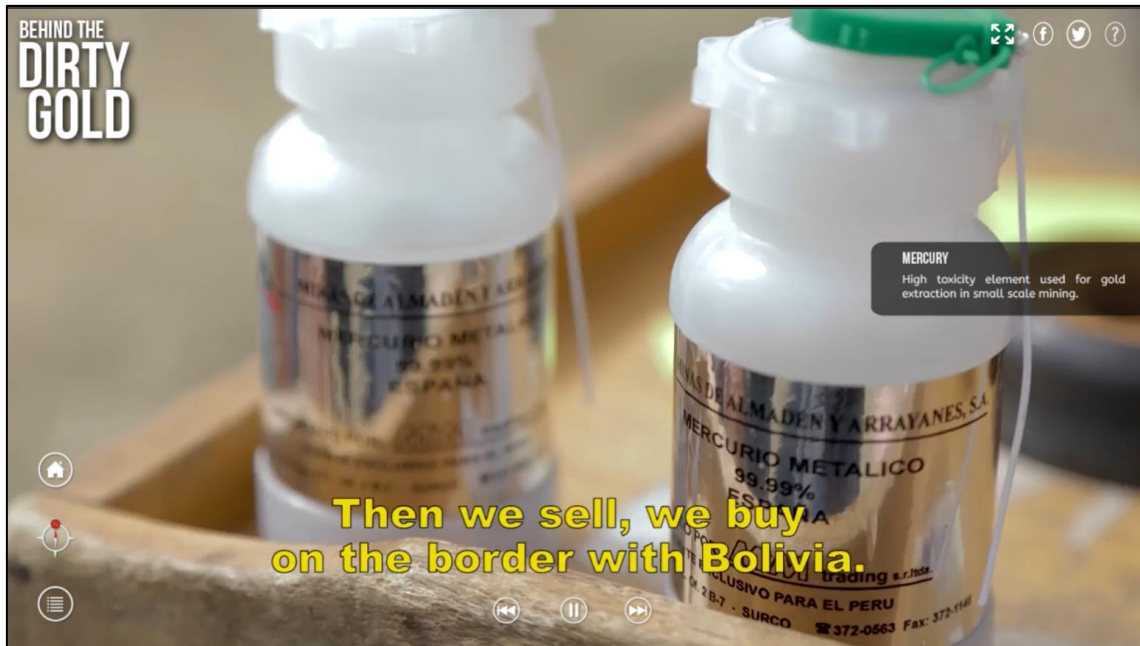
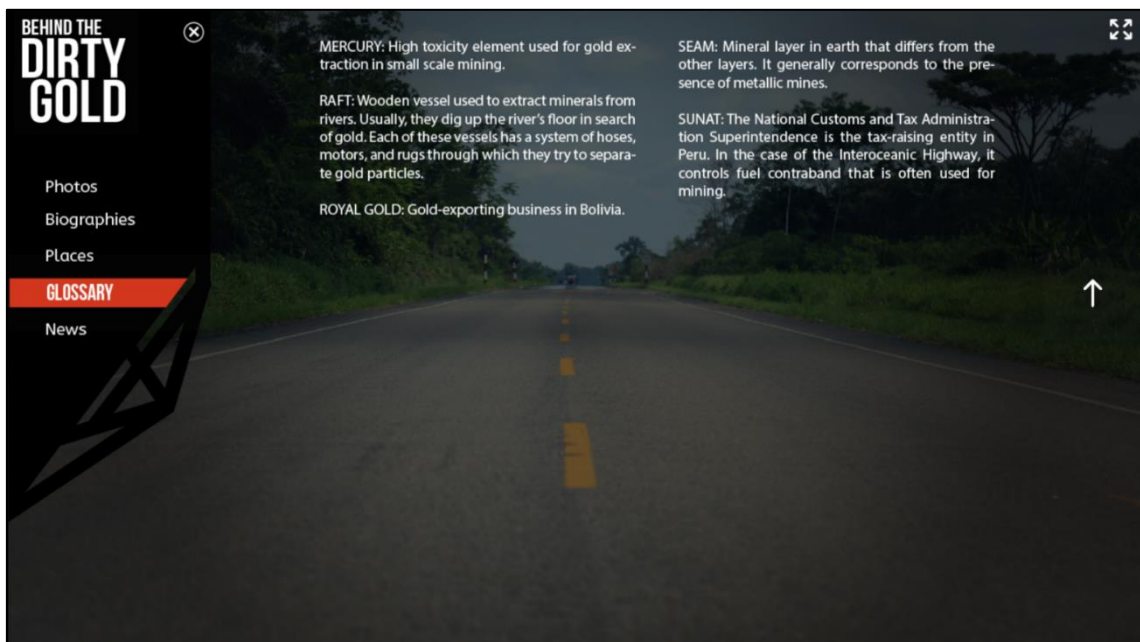


Figure C. 3.8

Semiotic mode of 'Written evidence': remediating information (no simultaneity)



Other instances of this semiotic mode include the biographies for agents involved in the narrative (Figure C3.9), the pieces of news associated to the events narrated in the ISDoc (Figure C3.10), or the short introductory texts that appear when travelling to the different countries (Figure C3.11).

Figure C. 3.9

Semiotic mode of 'Written evidence': short biography

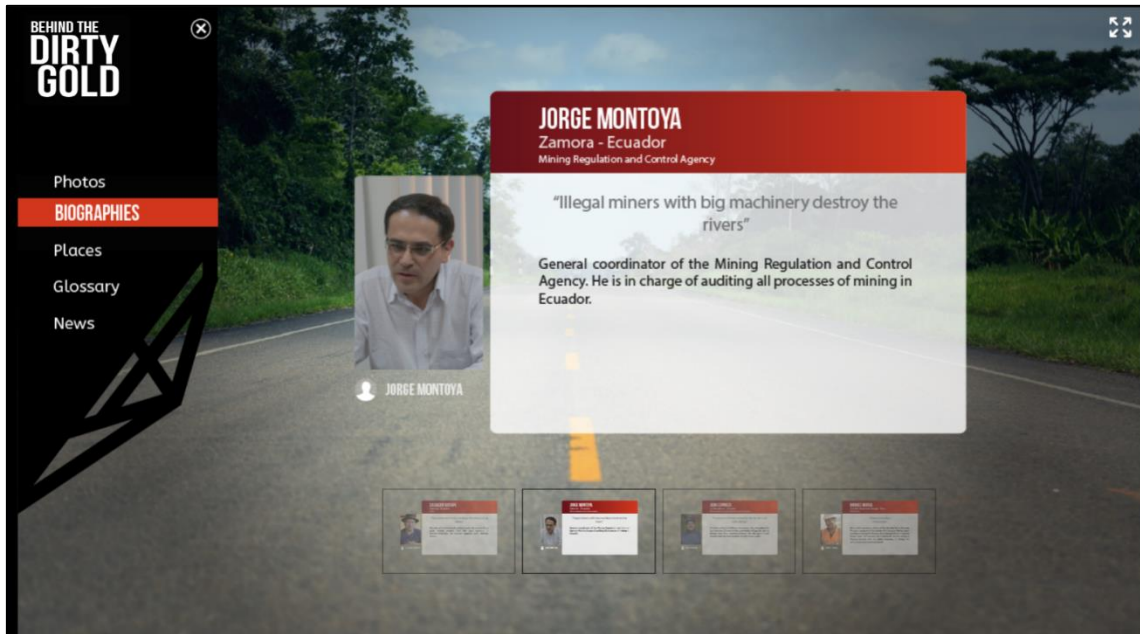


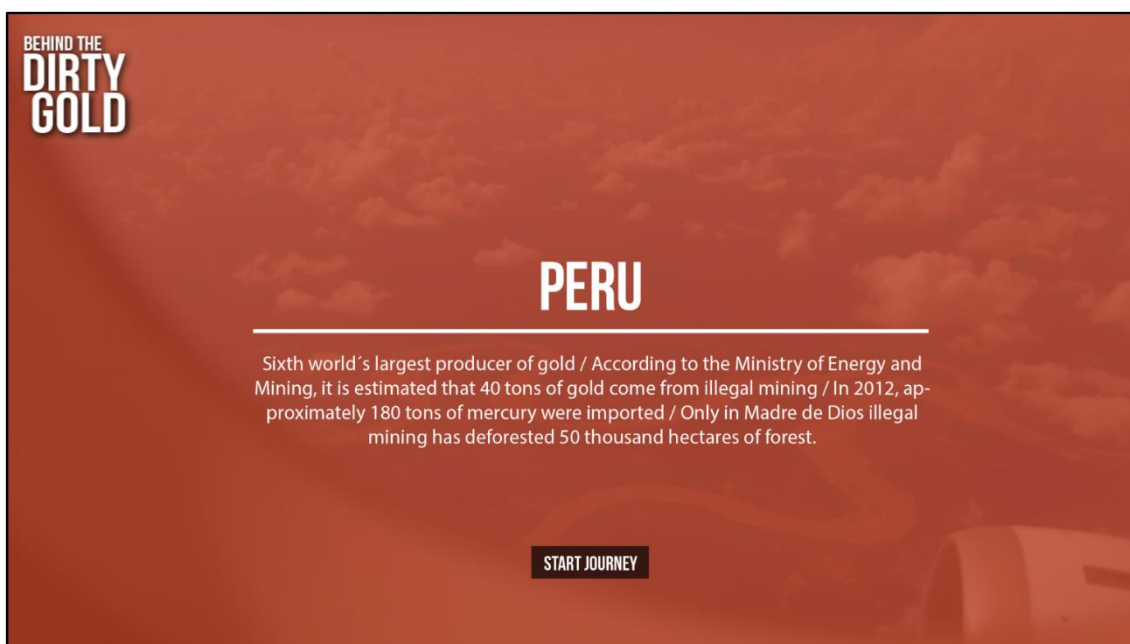
Figure C. 3.10

Semiotic mode of 'Written evidence': pieces of news



Figure C. 3.11

Semiotic mode of 'Written evidence': countries' introductory texts



The last two semiotic modes play a more reduced role in *Behind the Dirty Gold*. These are the 'Photographic evidence' and 'Cartography'. The former mostly involves the use of photographs that appear in an independent section within the ISDoc (Figure C3.12). Nonetheless, within the 'Colombia' chapter, the ISDoc includes the only instance of the semiotic mode that is interactive and built within the narrative itself, and not upon the supporting materials of the independent sections (Figure C3.13). The semiotic mode includes written text in the form of captions, and, for the interactive instance, it is combined with the 'Audiovisual narration' semiotic mode. Finally, the 'Cartography' semiotic mode is also embedded in and accessible from the main narrative, providing access to non-interactive maps with information about the regions that are visited in the narrative (Figure C3.14). The interactive instance of the semiotic mode (Figure C3.15), as section 1.1.3 within this case will explain, serves as the structuring menu that allows access to the different countries / chapters within the narrative.

Figure C. 3.12

Semiotic mode of 'Photographic evidence': non-interactive version

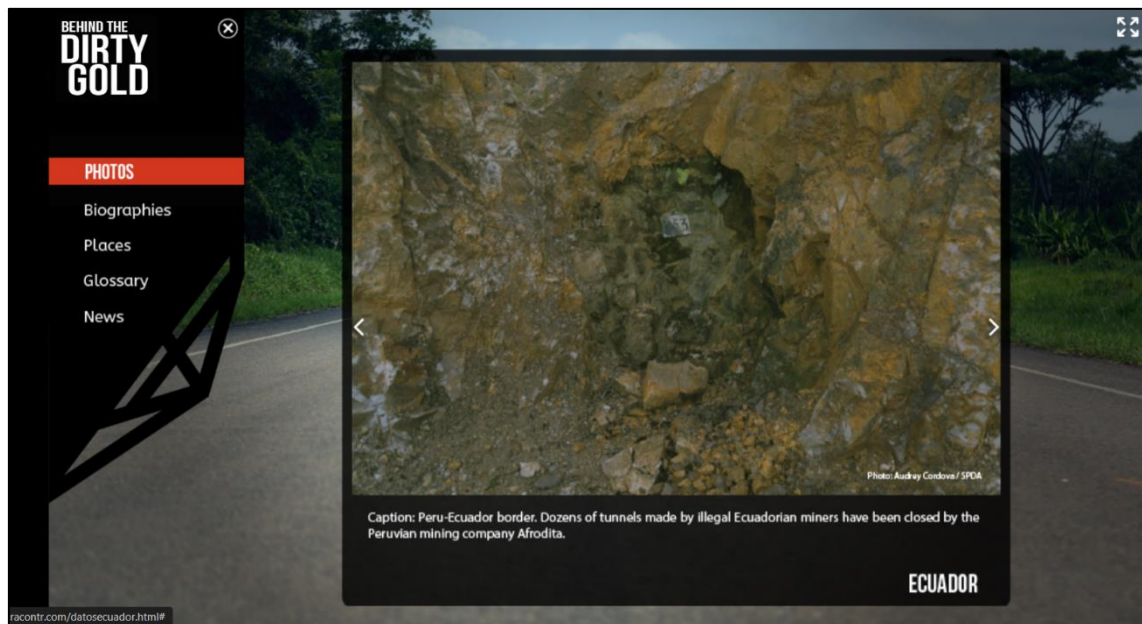


Figure C. 3.13

Semiotic mode of 'Photographic evidence': interactive version

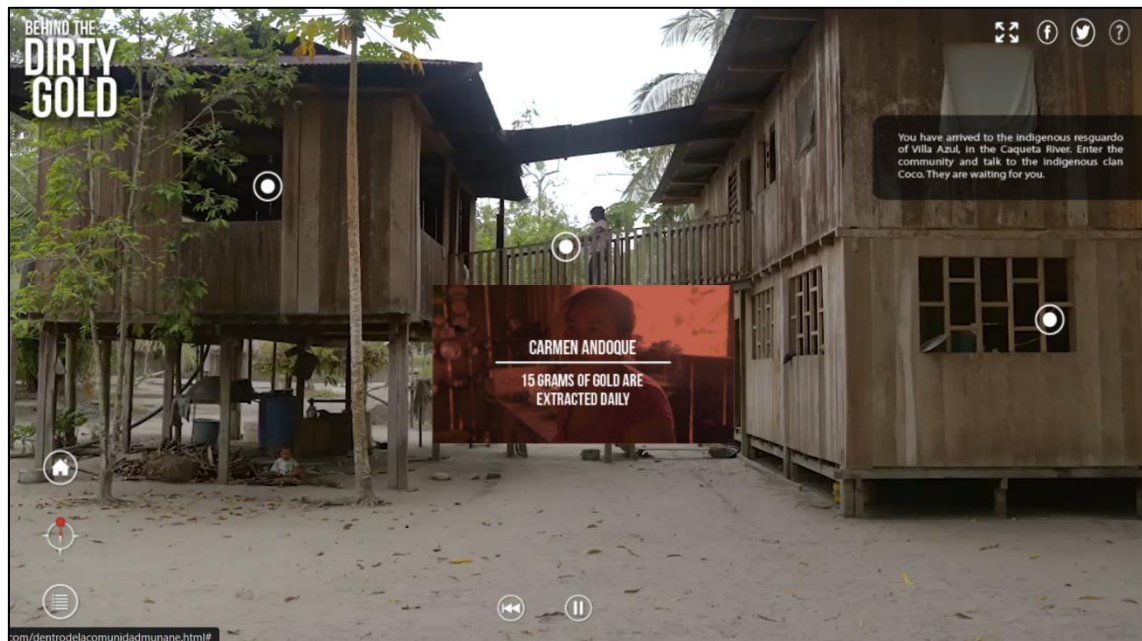


Figure C. 3.14
Semiotic mode of 'Cartography': non-interactive version

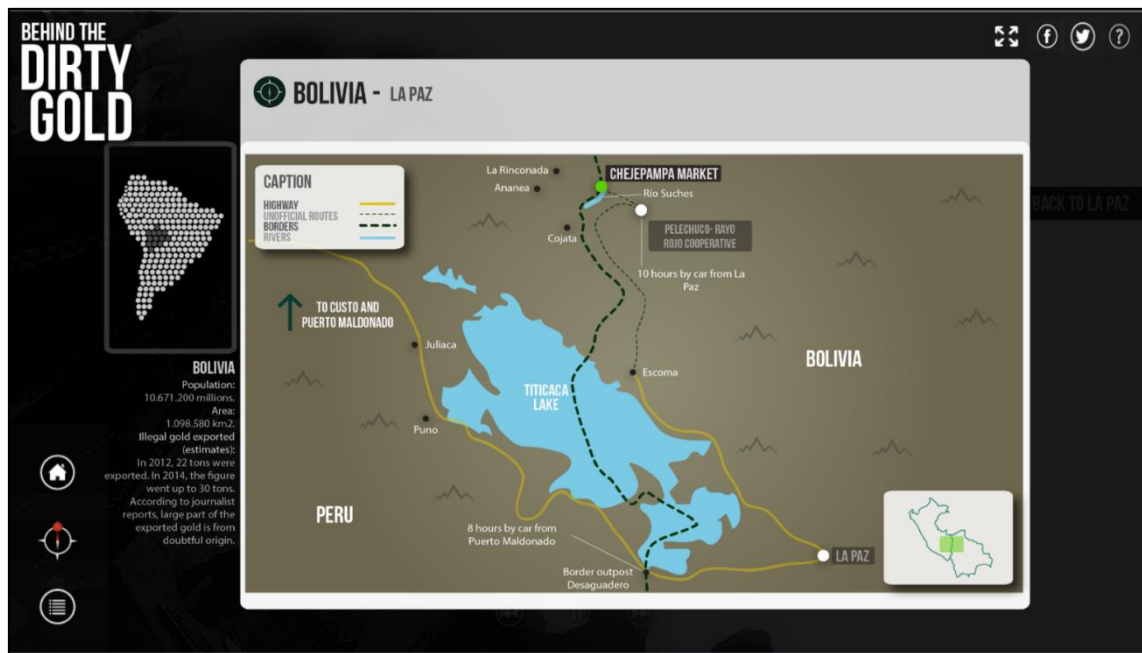


Figure C. 3.15
Semiotic mode of 'Cartography': interactive version



C3.1.1.2.- Media transformation of the ISDoc's Media Characteristics

Table 14 sums up the processes of media transformation that affect the ISDoc's semiotic modes from the matrix SD.

Table C. 3.2*Media transformation of semiotic modes in Behind the Dirty Gold*

Semiotic modes (Media Characteristics)	Transmediation / Media representation / Emerging	Role of interactivity in media transformation
Audiovisual / cinematic presentation / narration	Transmediation (and Media representation)	<ul style="list-style-type: none"> • User controls pace of information delivery • Simulation of agency / authorship / immersion over the contents
Written evidence	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery • User accesses remediated information within the page
Photographic evidence	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery • User accesses remediated information within the page
Cartography	Transmediation	<ul style="list-style-type: none"> • User controls pace of information delivery • User accesses remediated information within the page

As explained in the first section, *Behind the Dirty Gold* favours the use of the ‘Audiovisual narration’ semiotic mode (and its materialisations) for the transmission of scientific content. While the mode is an instance of transmediation, the materialisation involving phone message simulations rather corresponds to an example of media representation. In this instance, the ISDoc (as a native digital genre) represents the source media allowed in the digital phone’s canvas. This representation entails the simulation of the phone message’s materialities, that is, its distinctive visual aspect. As noted in the first section, this representation only involves skeuomorphism to its source media, favouring it over other forms of communication that fulfil the same function as the phone message. In this sense, the role of interactivity and interaction that the platform establishes with users through this materialisation is that of immersion, also achieved by the discourse semantics of the mode itself. This simulation of immersion extends to that of agency and authorship, which is mostly achieved by the interview simulations. Overall, the ISDoc deploys interactive resources within its semiotic

mode in order to allow users to control the documentary's information delivery, in a typical manner for the ISDoc genre.

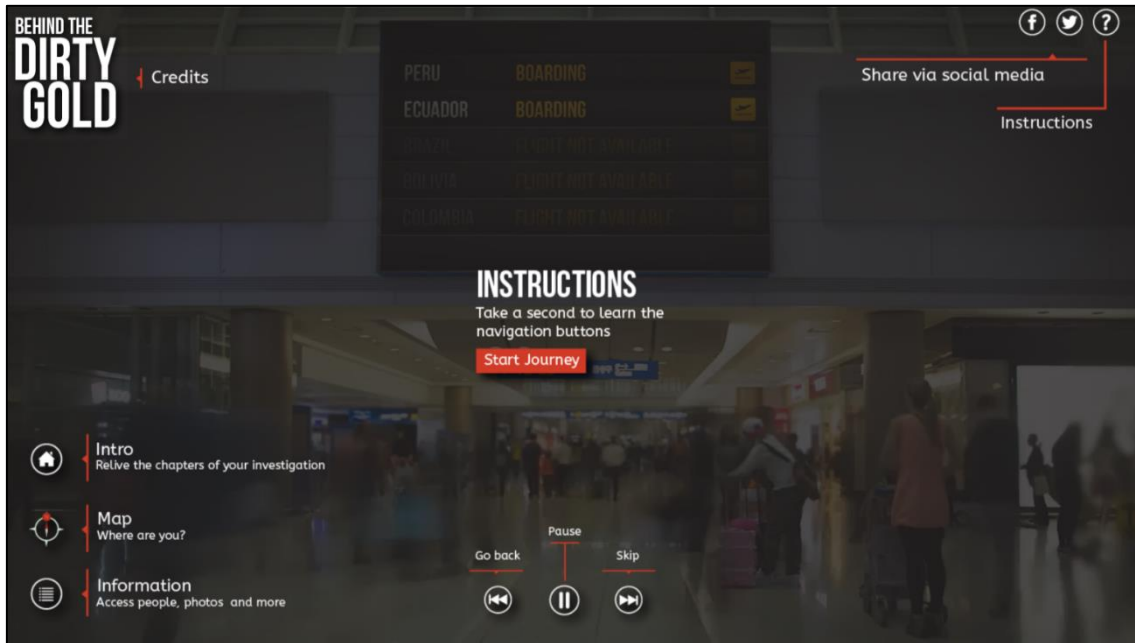
The rest of the semiotic modes of *Behind the Dirty Gold* are instances of transmediation that allow users to control information delivery and to access remediated information within the ISDoc. As exposed in section 1.1.1, the platform provides users with an in-built site in which additional information (with the exception of the 'Cartography' semiotic mode) about the narrative is encapsulated. Its access is completely optional (see sections 1.2.2 and 2.2) except for the case of the 'Written evidence' pop-up texts in the video narrative. Despite this, and by making use of the hyperlinked structure of the medium, the ISDoc employs interactivity to create a specific site that allows users free navigation through remediated contents at any point of the narrative.

C3.1.2. IDN structure

C3.1.2.1.- Interactive Sites/Signs

As a point of departure, it can be established that *Behind the Dirty Gold* harnesses diverse ISS varying in their forms, but with reduced actions and effects. For the latter, scrolling, hovering, and clicking paradigmatically enable access to new text within the documentary; the former substitute hyperlinking for an array of text and image-based ISS. In order to grant users a more complete understanding of the platform's forms and effects, the third scene featured in the documentary includes a basic tutorial encapsulating the main ISS which will be always at users' hands during the narration (Figure C.3.16). The 'Intro', 'Map', and 'Information' ISS paradigmatically redirect users (at any point of the narrative) towards specific sections of the documentary which contain additional material. The 'Back', 'Pause' and 'Skip' ISS allow users to control the pace of information delivery while in the main narration, to invite users on how to continue accessing to information. Both these ISS thus mainly fulfil a textual function. Finally, the top right corner ISS include the usual social media ISS, therefore enacting the interpersonal metafunction and orienting directionality towards users.

Figure C. 3.16
Instructions for main ISS



Most ISS in *Behind the Dirty Gold* are, as the next section will explore, *narrative vectors* – that is, story ‘milestones’ that perform several communicative functions such as ‘conveying important information, setting boundaries [...], and facilitating particular events’ (Koenitz, 2023, p. 78). In that regard, these narrative vector ISS enact the textual metafunction. There are two particular instances of these ISS that are consistently used in the narrative. The first one concerns the use of an airport boarding panel form to specify the locations in which the narrative is set (Figure C.3.17). How these ISS configure the narrative through paradigmatic action will be explored in the next section. Here, it can be pinpointed that, in Koenitz’s words, this configuration sets the boundaries for users to reduce the narrative possibilities. The other vectorial ISS include the use of the black pop-up texts appearing while in the ‘Audiovisual narration’ semiotic mode. As Figure C.3.18 depicts, the platform gives users two possibilities to advance the narrative. In combination with the phone message simulation, the vector functions as a ‘dramatic point’ in the narrative which requires user action, thus facilitating an ISS. Nonetheless, the ISDoc sometimes includes a single action to be taken (Figure C.3.19). In these cases, the ISS does not yield significant user control over the

narrative, but it may serve as a dramatic point before initiating the trip to another country / chapter.

Figure C. 3.17

Vectorial ISS: airport sign form

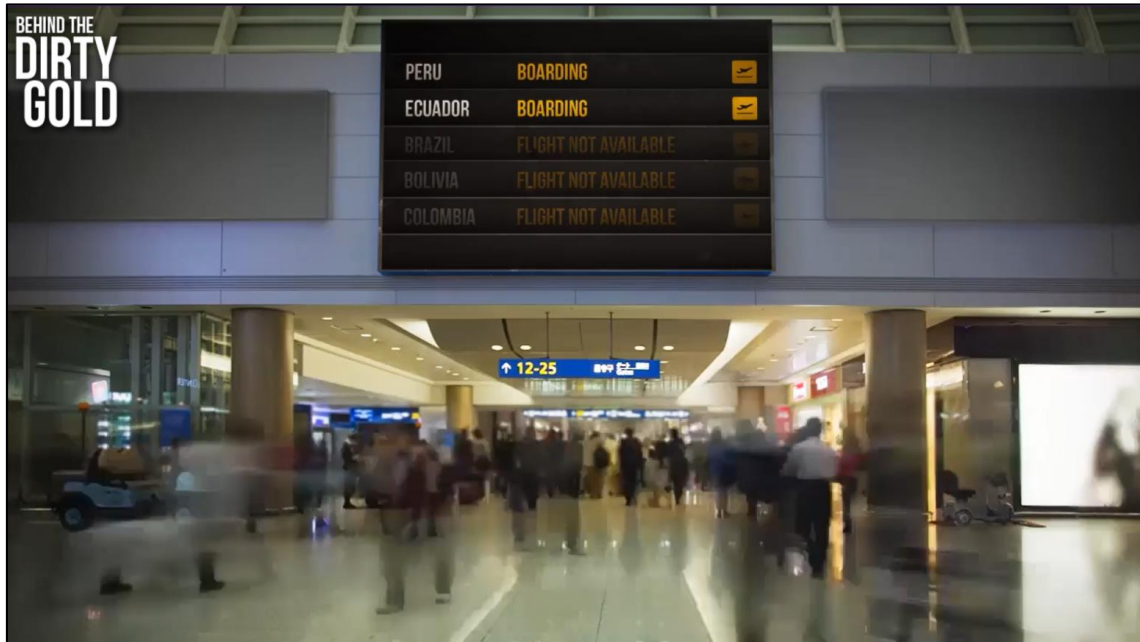
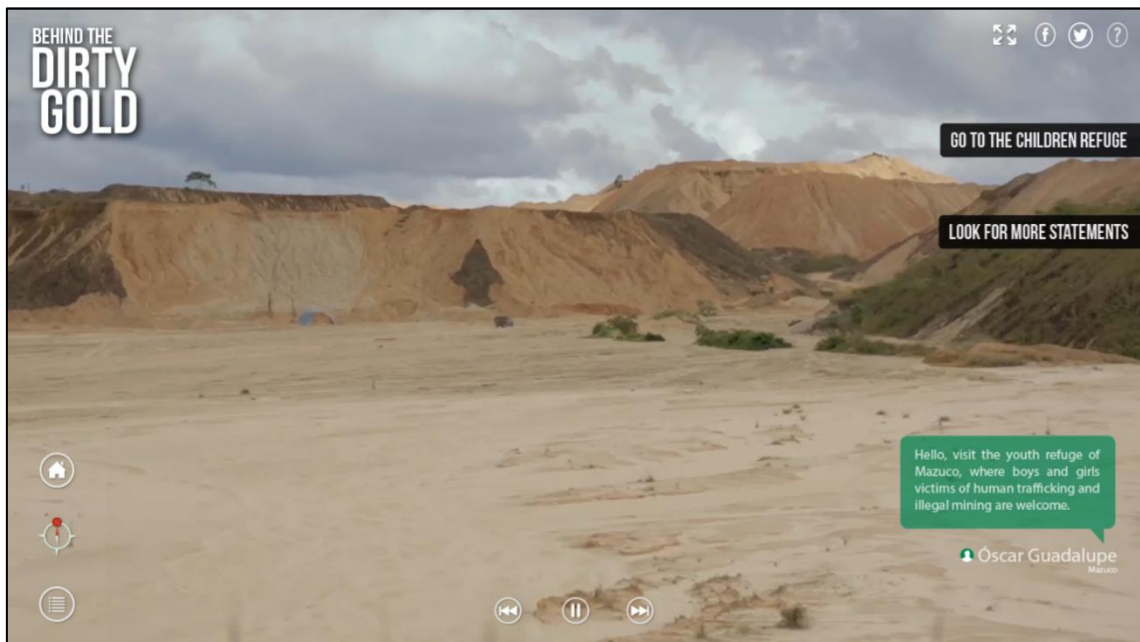


Figure C. 3.18

Vectorial ISS: multiple-choice pop-ups



Note. In combination with phone message simulation

Figure C. 3.19

Vectorial ISS: single-choice pop-ups



Finally, narrative immersion in *Behind the Dirty Gold* requires the platform to make use of ISS oriented towards users. It could be argued that the discourse semantics of the ISS (as part of a wider semiotic ensemble), which demands user action through imperative verbs, orients directionality towards users. Nonetheless, there is a more defined instance for this phenomenon, namely, the ISS that appear in interview simulations (Figure C.3.20). While the ISS allow users to control the specific piece of the narrative that interviewees are enquired about, they do not really enable users to create new meanings through the potential combinations of questions. If the interview did not include these ISS, the contents would be the same. Therefore, the inclusion of the interview ISS is completely due to the platform's enacting of the interpersonal metafunction, through which users are immersed into the interview and physically simulate the interviewer's agency into the ISS. As in the case of the vectorial pop-ups, some of the interview simulations only include a single-choice ISS, thus setting more boundaries to users' free manipulation of the content (Figure C.3.21).

Figure C. 3.20
Interview ISS: multiple-choice pop-ups



Figure C. 3.21
Interview ISS: single-choice pop-ups

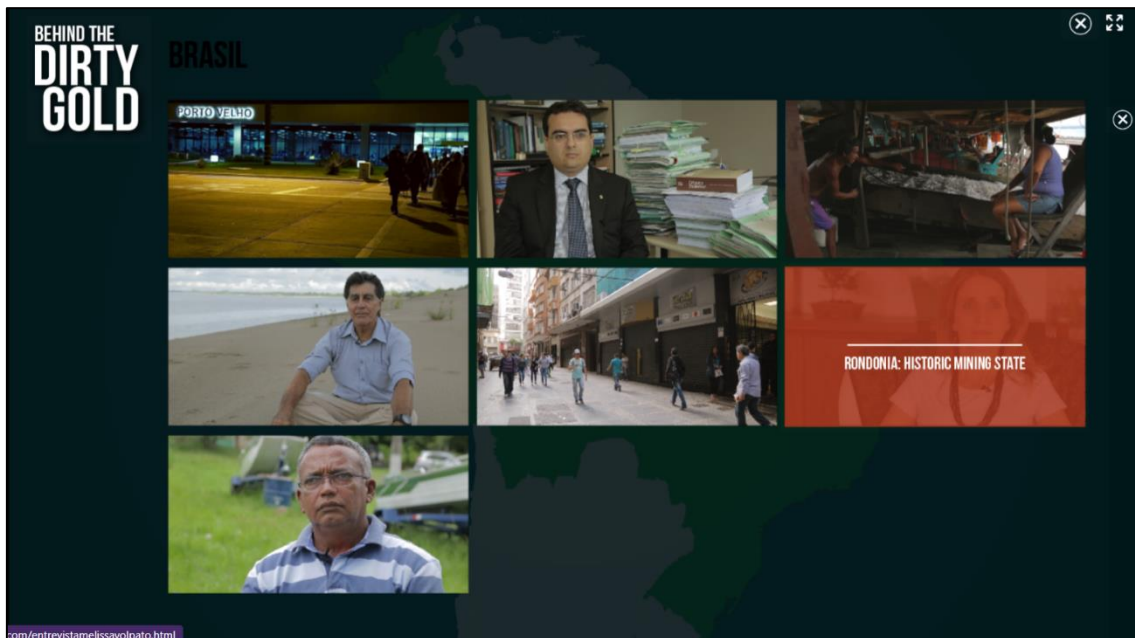


C3.1.2.2.- Interactive Digital Narrative design (Protostory design)

The protostory design in *Behind the Dirty Gold* follows a main structuring pattern: the narration tracks the story of a journalist travelling through different countries and interviewing different agents involved in the gold industry of northern South America. The countries provide the ‘chapter’ structure to the narrative, and the interviewed agents and accompanying narratives are the ‘episodes’ which belong to the chapters. *Behind the Dirty Gold* is composed of 5 chapters (Colombia, Peru, Ecuador, Bolivia, and Brazil) and 34 episodes, which can be accessed through two main navigation modes. The first mode makes use of the ‘Introduction’ ISS to access all chapters and episodes in the narrative. There are no restrictions in accessing the episodes: as shown in Figure C.3.22. All the episodes are available to the users in spite of the chapter not being ‘activated’ in the first introductory scene of the ISDoc, the boarding panel in the airport (as shown previously in Figure C.3.17).

Figure C. 3.22

Chapter-episode structure: access through ‘Introduction’ ISS



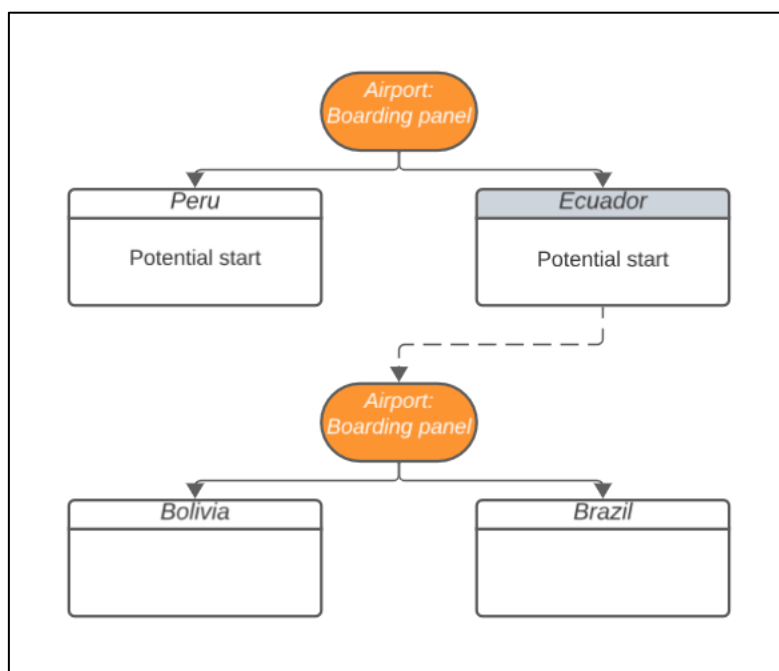
The second way of navigating the documentary is to follow the paths that are pre-designed in the platform, thus accessing chapters and episodes by interacting with the narrative vectorial ISS. These vectors do enable users to manipulate the order of lexias up to a certain extent: only in specific chapters do users encounter these

ISS. Articulating a full representation of the complete vectorial structure of the 34 episodes proves to be challenging for this thesis. Instead, only instantiations of specific parts of the story will be provided.

Usually, the potential vectorial choices involve accessing different episodes within a chapter (as seen in Figure C.3.18). The boarding panel is itself an example of vector, in which users have to decide whether to start the narrative by visiting Peru or Ecuador. The Ecuador start offers no vectors. After finishing the episodes, the user is sent back to the boarding panel scene, which displays the ‘Bolivia’ and ‘Brazil’ destinations (Figure C.3.23). A total of 8 different airport scenes are present in the protostory and can be accessed through different vectors in the narrative.

Figure C. 3.23

Instantiation of Ecuador chapter start



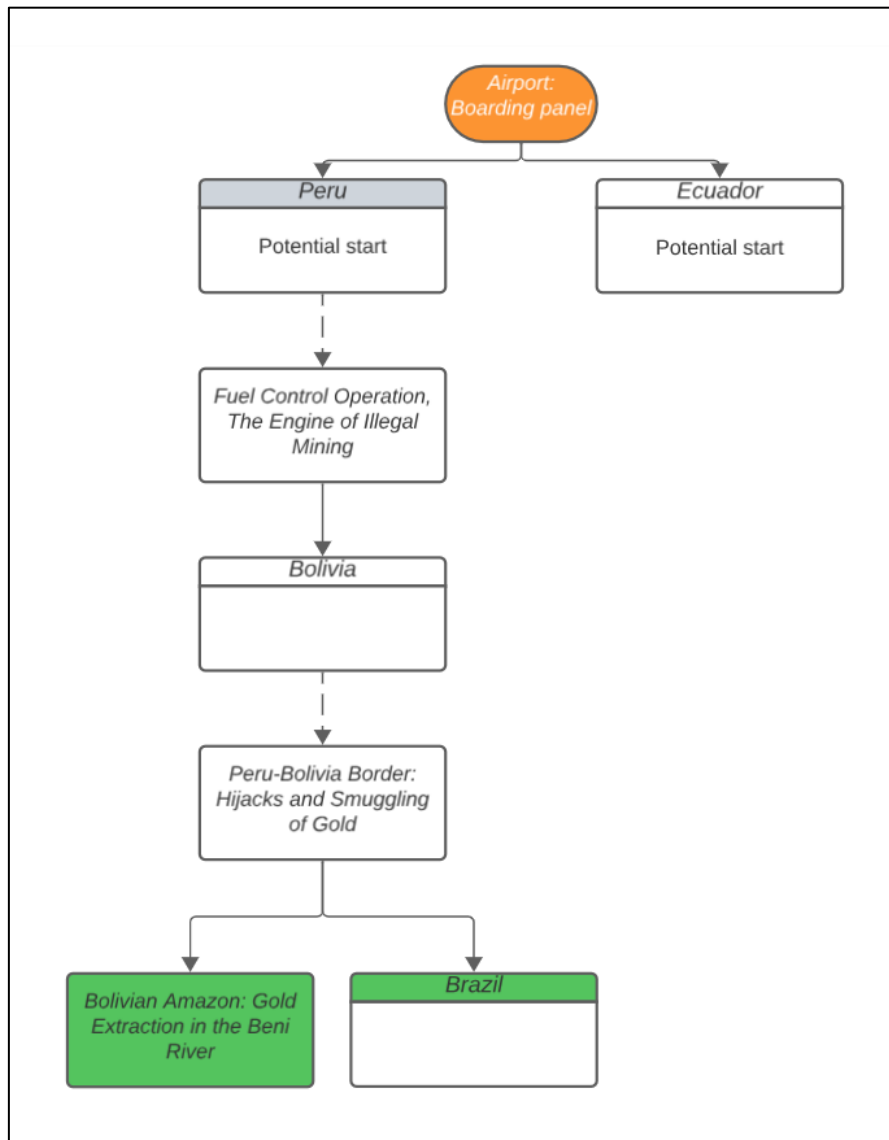
Note. Dotted lines indicate syntagmatic episodes that are not represented.

Some instances of the vectors allow the web user to navigate episodes which belong to different chapters. This occurs, for example, in the Peru chapter, where after the ‘Fuel Control Operation, The Engine of Illegal Mining’ episode, the only vectorial ISS moves the narrative towards the Bolivia chapter (Figure C.3.19). While this evolution of the narrative is ‘logical’ in that all Peru episodes are by then finished

and there is only the possibility of moving onto another chapter, the Bolivia chapter features another instance in which, after experiencing the ‘Peru-Bolivia Border’ episode, the narrative offers the users the option of either continuing to visit the country or moving on to the Brazil chapter (Figure C.3.24).

Figure C. 3.24

Instantiation of Peru chapter start



Note. Paradigmatic vector leading to either episode or different chapter (represented in green).

A noteworthy feature can be extracted from these first two instantiations. As mentioned, access order to any initial chapter involves differences in the way the

ISDoc structures further access through the airport scene. While this already implies a change in the structure of the instantiation, it also has a textual impact. Depending on the way of access to the chapters, that is, the previous episode which leads to either the airport scene or the next chapter's episode, the documentary will feature optional cut-scenes and narrative vectors. An instance is the 'Go to Bolivia' vectorial ISS (Figure C.3.19), which only appears after completion of the Peru start instantiation, not the Ecuador start. Another is the access to the Brazil chapter: Figure C.3.25 shows the access through the airport scene; Figure C.3.26 represents access through (1) Bolivian 'Peru-Bolivian Border' episode, (2) Bolivian 'Guayamerín River' episode, and (3) Bolivian 'State-Run Company' episode. Therefore, the platform can be said to evolve (although to a minimal extent) depending on the users' choices through their instantiation, thus enabling potential re-instantiations to occur and rewarding users with different interactive and textual choices.

Figure C. 3.25

Instantiation of Brazil chapter access: airport

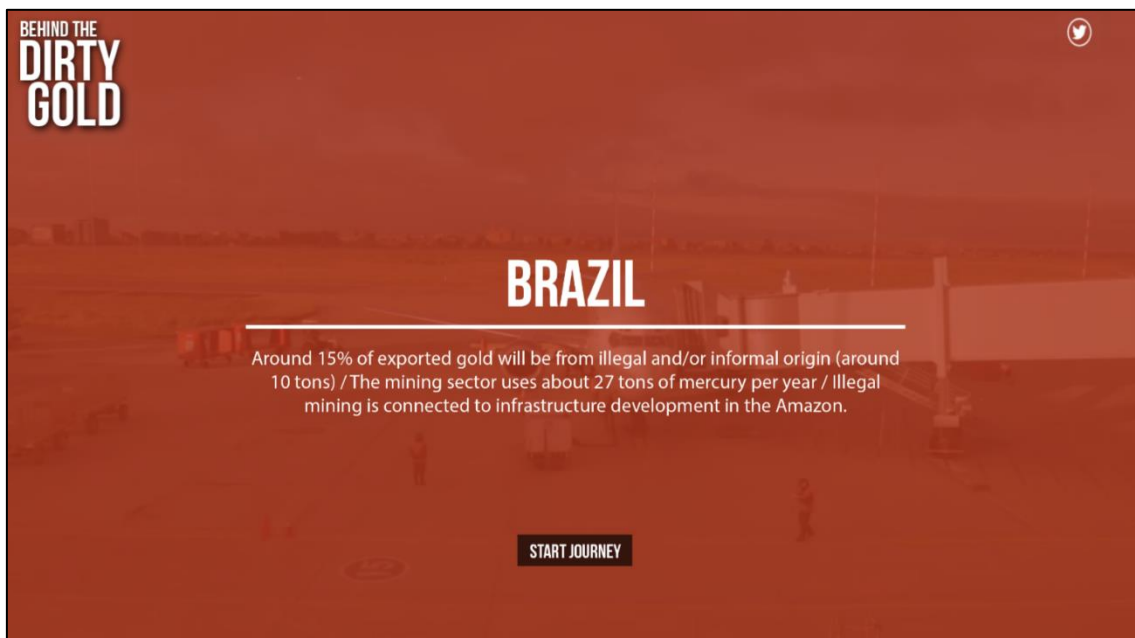
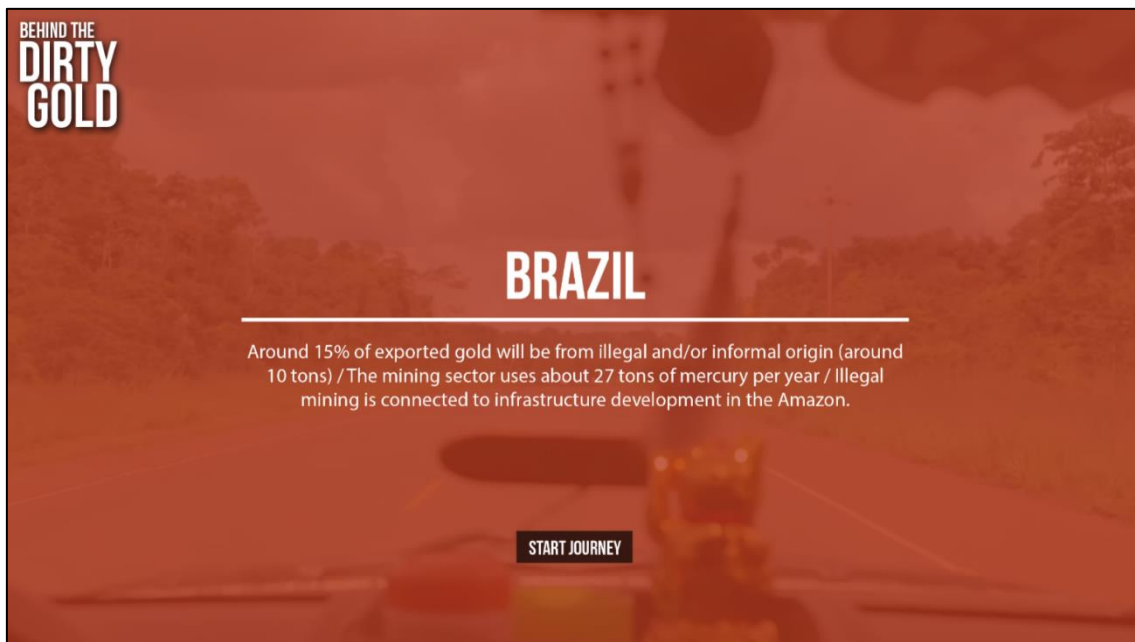


Figure C. 3.26

Instantiation of Brazil chapter access: road



Ultimately, despite the interconnected, branched structure of *Behind the Dirty Gold* suggesting that the narrative design of the ISDoc could potentially result in different endings or outcomes, and maybe because of technical issues, the documentary has no definite ending. Finishing some chapters allows users to revisit the whole chapter or specific episodes, but no episode is devoted to providing an ending to the narration. Whether intended or not, this happening reinforces the circular and potentially re-instantiable nature of the protostory.

The connection between the additional materials located in the 'Information' section and the narrative itself is merely ideational, with the exception of the aforementioned embedded 'Written evidence' semiotic mode. In this sense, the inclusion of this section in the documentary can be said to be mostly paradigmatic. Access is granted through the 'Information' ISS, which is syntagmatically accessible at any point of the narration. Despite this, the retrieved text in the Given – New textual relation is distinctive in terms of format and use of materialities to those located in the main narrative, thus being represented in the protostory as a completely independent node.

C3.2. SCIENTIFIC CONTENTS AND LEGITIMATION OF SOCIAL ACTION

C3.2.1 Documentary Contract Clause 1: Truth and Reality

As in the previous case studies, several semiotic modes conform the *Behind the Dirty Gold* and fulfil a range of narrative modes (Table C.3.3):

Table C. 3.3

Semiotic modes and narrative modes in Behind the Dirty Gold

Semiotic mode	Narrative mode
Audiovisual narration	Expository + Explanatory
Written evidence	Explanatory
Photographic evidence	Expository + Explanatory
Cartography	Explanatory

As part of the strategies of simulation, *Behind the Dirty Gold* constructs the story through the use of the ‘Expository’ narrative mode, which all semiotic modes enact. As section 1.1.1 analysed, immersion strategies were mostly displayed in the materialisations of the ‘Audiovisual narration’ semiotic mode, by which narrative vectors are used to directly address users and redirect their attention towards other narrative lexias. This impression of immediacy, together with the content displayed in the ‘Audiovisual narration’ semiotic mode’s materialisations, help enact the ‘Truth’ clause for *Behind the Dirty Gold*. All the content displayed in the base materialisation of the semiotic mode (that is, the narration itself) corresponds to evidence for the journey through South America. Phone message simulations, although fictional (as explained in the first sections of this analysis), provide narrative support for decision taking in the diegesis. Interview simulations maximise the sense of immediacy and factuality by directly transposing users into ‘taking control’ of the journalism investigation. Together with this, this evidentiary footage is combined with the text-based captions, which provide additional information for the places, people, and events that the user encounters throughout the journey (see Figure C.3.3). To some extent, the inclusion of these captions corresponds to the ‘Explanatory’ narrative mode. While not being instances of remediation, their communicative function is to give access to additional context

to the experiences and provide a background for the narrative. Altogether, the combination of narrative modes functions as the main articulator of evidentiary contents in the documentary.

This can be extended to the role of the 'Photographic Evidence' semiotic mode. The use of photographic footage helps provide additional visual context for the narration in the manner that Figures C.3.27 and C.3.28 depict. The former encapsulates the most important information from the audiovisual footage of the 'Peru-Bolivian Border' episode into a single photography. The latter remediates the target scientific content (safety side-effects of mercury use in gold extraction) into simplified information for target audiences. For its part, the inclusion of the interactive version of the 'Photographic evidence' semiotic mode exemplifies the enactment of the 'Expository' narrative mode. As also seen previously in Figure C.3.13, in that instance, the use of photography helps to delimit possibilities for user interaction and offers closed options for the advancement of the narrative. As it yields control over the narrative to the user, it increases the illusion of immediacy and thus, of factuality of the contents.

Figure C. 3.27

'Photographic evidence' semiotic mode: 'Explanatory' narrative mode

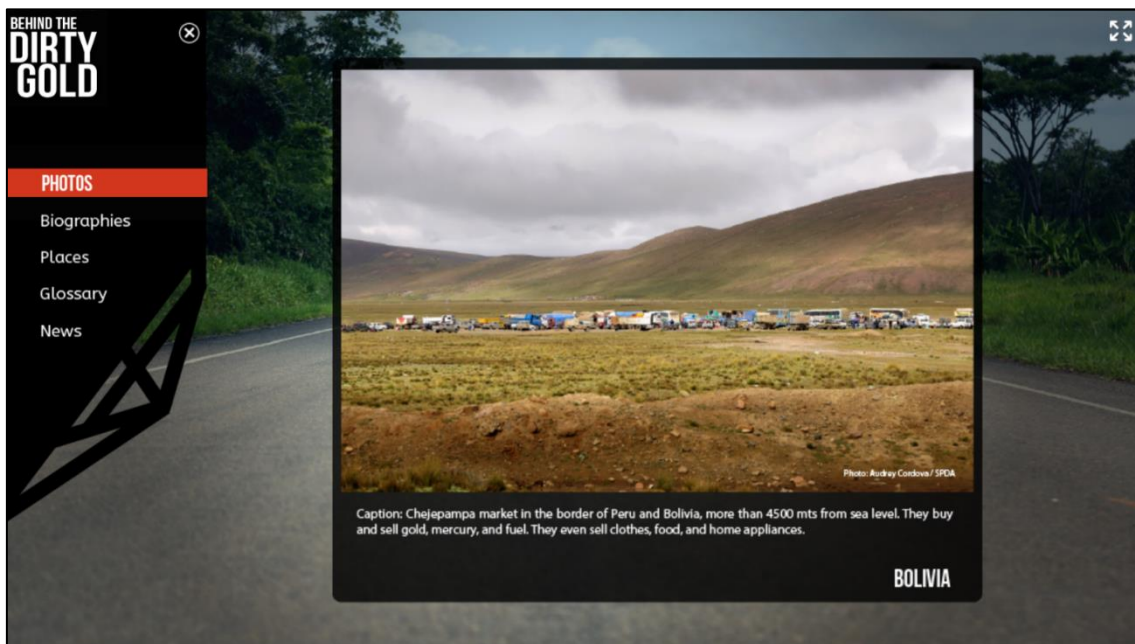
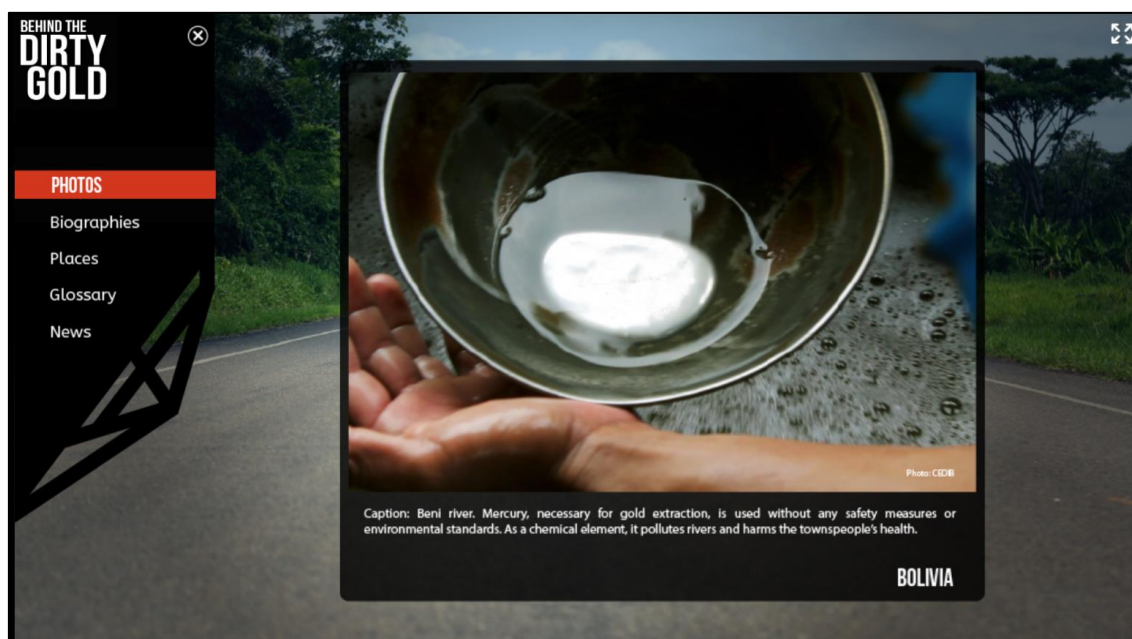


Figure C. 3.28

'Photographic evidence' semiotic mode: 'Explanatory' narrative mode



The remaining semiotic modes of 'Cartography' and 'Written evidence' exclusively enact the 'Explanatory' narrative mode. As explained in the first section, the instances of both modes are used in the documentary to remediate the information of the audiovisual narrative. This crystallises in the creation of several subdivisions within the 'Information' section. In either its 'Biographies', 'Places', 'Glossary' or 'News' section (or embedded into the narration through the 'Map' ISS), the inclusion of remediated information serves as a supporting tool for avoiding users' disorientation while experiencing the platform, while at the same time simulating the note-taking involved in journalistic activities and increasing the illusion of immersion and factuality.

C3.2.2 Documentary Contract Clause 2: Taking action and Edifying actively

As a general rule established in Chapter 2, the 'Taking action' clause is realised in ISDocs through the use of interactivity. *Behind the Dirty Gold* harnesses this affordance mostly through the 'Audiovisual narration' semiotic mode, where most of the ISS are embedded. Through these, the ISDoc's interactive possibilities are deployed offering three main functionalities: factuality, immersion, and control over the narrative.

The first two functionalities are similar in terms of application. As discussed in previous sections, the ISDoc's materialisation of the 'Audiovisual narration' semiotic mode includes the simulation of interviews and of phone messages. For these instances, the use of interactivity reinforces the immediacy for users to experience the platform's contents almost in real time. By aligning narration, direct addressing to users, and replication of roles within the narrative itself, *Behind the Dirty Gold* crafts a complete imitation of a journalistic journey through South America. The shortcomings are evidenced in section 1.1.2 within this analysis. While immersion through the modes is achieved on the textual level, by which the structure and discourse semantics of the source media are replicated, there is not complete freedom for users to control their response to the system, either by means of user-user communication, or by designing interview questions.

In any case, and by creating the immersive experience, the interactive affordances of the ISDoc additionally recreate the impression of factuality. More than receiving a pre-determined instruction about the environmental and social dangers of gold extraction, the ISDoc is committed to including as much hands-on experience of the platform as possible. Users do explore a pre-crafted protostory on which they have to directly interact. Yet, more than interactivity being used as a mere control for the pace of contents, it places *responsibility* on the part of users for visiting the area and making themselves part of taking action over the diegetic contents. This simulation is in line with Van Dijck's definition of the 'Expository' mode as a 'reality effect'. In *Behind the Dirty Gold*, the impression of factuality is achieved by offering users continuous stimuli for interaction, which does not mean that they are always 'answered' by users. Scenes in the chapters, although integrated syntagmatically within the story, can be left out or skipped during the instantiation. Interviews can also be skipped after being answered to at least one question. Of course, the location of the remediated contents (featuring mostly the 'Written evidence' and 'Photographic evidence' semiotic modes) implies that accessing completing gaps in knowledge about the narration, gathering additional material, and accessing remediated scientific information has to be carried out by means of specific interaction with ISS located outside the narration itself. While all these contents

could potentially be elided by the users, the interactive structure of *Behind the Dirty Gold* suggests the following: a meaningful playthrough of the ISDoc can only be achieved if the user truly takes action over the interactive cues that are ‘baited’ on the part of the platform.

Finally, from the point of view of narrative control, the platform makes use of interactivity to reduce the possibilities for exploration of the documentary. As specified in section 1.2.2, the 34 episodes of the ISDoc could be visited freely, but the platform offers the possibility of following a pre-determined narrative in which users make on-the-go decisions. These decisions are materialised in the vectorial ISS, which offer narrative paths that differ depending on the order of access and vary in successive instantiations. Hypersemiotically, this reduction of options on the part of the platform helps users in establishing sequentiality to the granularity of the chapter-episode structure. Learnability of the platform’s interactive affordances is therefore increased since the structure features a regularity of ISS and interactive procedures during the playthrough. Finally, what seems to hinder the establishment of an overall story arc over the journey represented in the documentary is the absence of a clear ending, which, given the platform’s intent on building different sequence paths, seems contrary to it. Nonetheless, the open ending could be intended, as the search for the conclusion of the story arc may be a way to encourage potential re-instantiations of the story, further eliciting the user action through the documentary.

CHAPTER 6. TOWARDS AN INTERPRETATION OF ISDOCS AND HYPERSEMIOSIS

The primary goal of this chapter is to provide an overview of the ISDoc genre and the wider implications of this thesis for the disciplines involved in its examination. These were the initial Research Questions that guided this investigation:

1. How are the social objectives of the documentary genre aligned with the interests of scientific communication?
2. Which technical affordances in the context of Web 2.0. have supported the transmediation of the documentary genre?
3. How is scientific knowledge in ISDocs constructed through the narrative relation established by its creators and audiences within the digital interface?

This chapter characterises the ISDOC in light of the findings of the case studies of Chapter 5. In this regard, each subsection examines the results from the hypersemiosis analysis, further exploring each case study's key factors in the enacting of the genre's social action. Then, based on the findings from the case studies, I characterise the genre in relation to the overarching tendencies in the configuration of the ISDoc, thus delving into the preference in use for certain semiotic modes, ISS, and narrative design. Finally, moving broader, I will explain what the ISDoc reveals about new practices in documentary filmmaking. I will also provide some considerations regarding where the ISDoc is positioned among the genres of science communication / dissemination online, and how the ISDoc could inform analytical tools and procedures under the optics of Rhetorical Genre Studies.

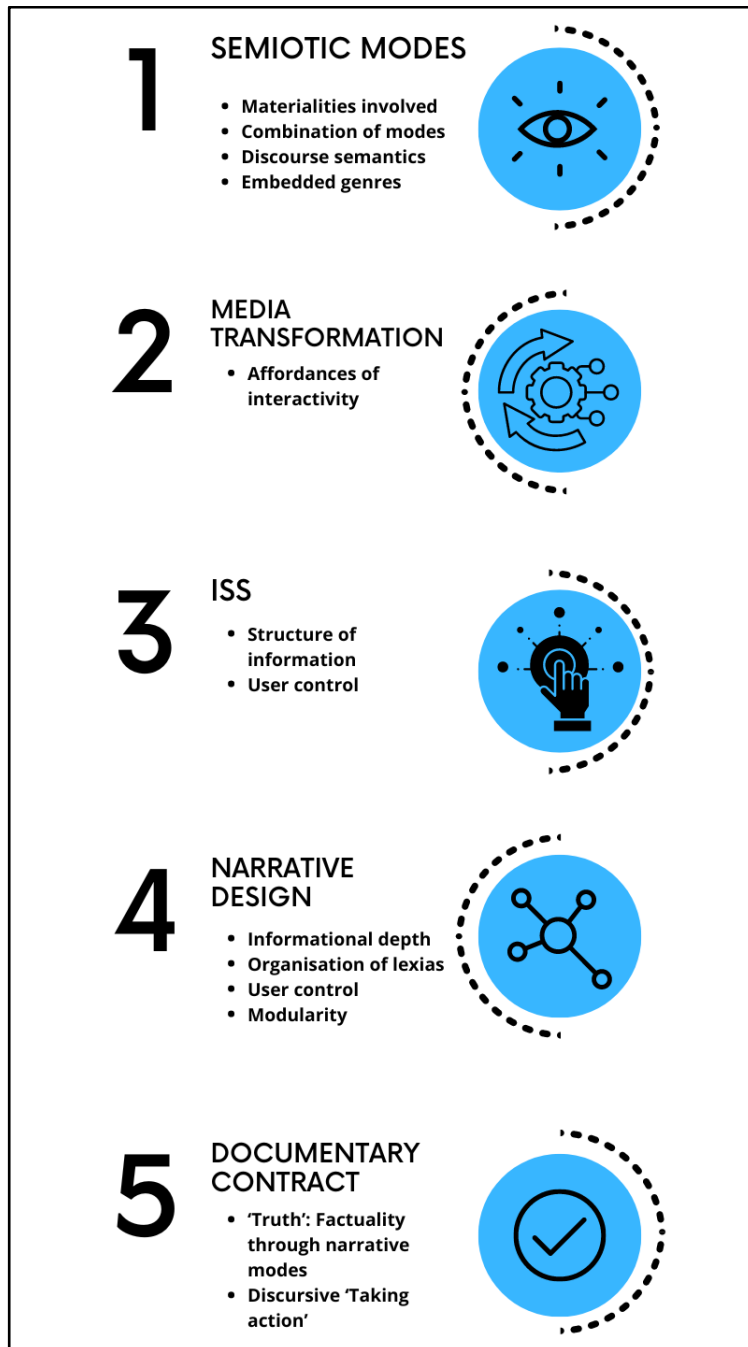
6.1. INTERPRETATION OF CASE STUDIES

The interpretation of the analysis of the case studies carried out in Chapter 5 involves searching for the reasons underpinning the choices made in every ISDoc. For this thesis, this implies, following Cresswell's (2016) study on qualitative methods and case study research, that the description of the choices made in each ISDoc text entails wider design decisions. These decisions then need to be further interpreted, since they may be related to the fulfilment of the genre's social action.

As explored in Chapter 5, these key choices are related to the main categories that formed the hypersemiosis framework applied to the ISDoc genre. First, the use of semiotic modes involved differences in the materialities engaged, how their discourse semantics functioned within the text, and whether they could correspond to instances of embedded genres. In terms of media transformation, a major theme was the role of interactivity and what it enabled for these semiotic modes in the digital environment. For Interactive Sites/Signs, their mapping onto the syntagmatic and paradigmatic phase of the metafunctions allowed us to describe the structure of information and how it was controlled by users. For narrative design, key themes entailed the level of informational depth, the organisation of lexias and user control over them, and the modularity / granularity of the ISDoc product. Finally, for the enactment of the Documentary Contract clauses, the case studies explored how factuality was built in the text through the inclusion of different narrative modes and opportunities for users to discursively 'take action' on the platform.

These sections then explore these themes in greater depth, identifying the key design choices on which each ISDoc text more readily relies on so that the genre fulfils its social action. Figure 6.1 shows the target categories for analysis.

Figure 6.1
Categories for analysis of hypersemiotic framework



6.1.1 Case Study: The Last Generation

Semiotic modes

As described in Chapter 5, *The Last Generation* is an ISDoc focusing on the impact of climate change on the lives of the Marshall Islands inhabitants. Of the 5 semiotic modes present in the text, 'Audiovisual narration' predominates through different

instantiations. The remaining modes, namely ‘Cartography’, ‘Data visualisation’, ‘Photographic evidence’ and ‘Written evidence’ are subsidiary to the main mode. Both the predominant position of the ‘Audiovisual narration’ mode and its instantiation with different supporting materialities (written text) suggest that *The Last Generation* is the ISDoc that most resembles the traditional ‘discourse of sobriety’ (Nichols, 2001) of the Science Documentary. Chapter 2 explored how the rhetoric of science was built in these documentaries, entailing, in Nichols’ words, the detachment of creators from the text and treating the subject matter ‘from the outside’, as required by the ‘voice of science’. While *The Last Generation* certainly does not employ the same actors and technical filmmaking resources (for example, the ‘voice of God’ of the documentary narrator, leaving it to the Marshallese interviewees), at least the main cues employed for meaning making through the semiotic modes are maintained through the predominance of the ‘Audiovisual narration’ mode.

Regarding the remaining semiotic modes, these scarcely appeared in combination in the narrative. Only two instances were identified in the text: the first, by which a ‘Data visualisation’ mode overlapped a ‘Cartography’ instantiation, and the second in the instantiation of ‘Data visualisation’, which includes materialities from the ‘Audiovisual narration’ mode. What derives from this is that the ISDoc text, apart from favouring a specific semiotic mode, establishes a clear separation between this mode and the others in terms of the functions they fulfil within the narrative. As seen in Chapter 5, while the ‘Audiovisual narration’ mode carries the narrative forward, the rest of the modes are tasked with providing a deeper level of understanding to scientific contents (an idea which will be expanded in the next sections). This case study thus confirmed that this semiotic mode hierarchy is readily adopted in the ISDoc genre to accomplish the communication of scientific content.

These findings have important implications at the ‘discourse semantics’ level, defined as the level in which ‘structural configurations of the [materiality] level’ are correlated with ‘contextual interpretations’ (Bateman, 2017, p. 8). The structural configurations of the materiality level are highly cohesive (and thus,

highly *expectable* when interpreted in context) across the text. At the level of discourse semantics, the 'Audiovisual narration' mode offers an arrangement of linguistic and multimodal resources that is maintained throughout the narrative. The interviewees use the kind of linguistic forms associated with the retelling of past experiences and future hopes of expectations for their existence in the island, in a manner expected for young children and teenagers; the black boxes, as the authoritative 'voice of God', are expected to (and do) present factual information through simple utterances. The same is accountable for the rest of semiotic modes: 'Cartography', 'Data visualisation' and 'Photography' featured written annotations that are ancillary to the visual materialities and were simple and factual; and 'Written evidence', where expert voices in different fields (e.g., politics, environmentalism) are quoted, featuring the linguistic resources and register expected to the position of the authors.

Finally, it is noteworthy how *The Last Generation* makes use of semiotic modes that could be susceptible of being analysed as genres outside the ISDoc text. Chapter 4 followed these criteria to classify a semiotic mode as an embedded genre: they should (1) have an independent and functional existence outside the ISDoc genre, (2) within the text, act in accordance with the ISDoc genre's social action and the text's overall communicative purpose, and (3) convey the use of one or various semiotic modes and/or materialities which, in combination, fulfil a purpose on their own. Following these, in *The Last Generation*, 'Cartography', 'Data visualisation' and 'Photography' were identified as embedded genres. In spite of this, what is remarkable is how their associated materialities (for instance, 'Data visualisation' include the usual arrangement of 'visual dashboard' and 'brief description' catalogued in studies such as Li and Liu, 2016) are integrated within the overall ISDoc interface. This foregrounds the highly hybridising capacity of the genre, specially as a result of its use of digital affordances: in the case of *The Last Generation*, embedded genres are integrated into the interface and perceived as an interaction of semiotic modes geared towards the treatment of the subject matter and the fulfilment of the Documentary Contract.

Media transformation

As shown in Chapter 5, semiotic modes in *The Last Generation* mostly underwent transmediation; that is, the representation of the ‘virtual’ source medium from the matrix Science Documentary with the digital and interactive affordances of the ISDoc genre. The use of these interactive affordances, nonetheless, only provides users with limited control over the platform contents. This approach to documentary falls within Gaudenzi’s (2013, p.11) category of ‘semi-open mode’ of IDoc, where users can participate in the content but cannot change the structure of the documentary itself. In the case of *The Last Generation*, the use of interactivity seems to be in line with Miles’ (2014, p. 76) consideration as ‘a reduction, a choreography of the radically open of the virtual and the crystalline through the reducing interest of decision’, something which is also revealed by the design of the ISS and the narrative structure.

Interactive Sites/Signs

In line with the previous section, ISS in *The Last Generation* plays a crucial role in reducing users’ options for free control of the platform’s contents. Chapter 5 revealed that ISS in the text offered clear differences in their forms, actions, and effects. A first subset of ISS include the dynamic sidebar (which allows tracking of the chapters’ contents through paradigmatic interaction) and ISS specific to certain semiotic modes (for instance, the arrows that control the slideshow in the ‘Photographic evidence’ mode) or related to SNS. The second subset include the “Begin”, “Explore”, “Watch”, and “Read More” ISS.

Several considerations stem from this design. First, in light of the case study analyses, I would argue that ISS in the text are distinctly shaped in terms of the *effects* that are intended within the narrative. This means that the *forms* of the ISS clearly played a function within the narrative that users may easily identify as such. This is especially true for the case of the first subset of ISS: users may not expect these ISS to develop into another independent lexia, but only minimal changes to the narration, if any. For the second subset, these expectations are different, since their form already advertises the inclusion of more material through changes in

the interface. This leads to the second consideration: paradigmatic interaction on *The Last Generation* ISS is highly cohesive in the Given-New textual evolution. Simply put, this arrangement reinforced the idea that there are very clear expectations about the expected effects of interactions. Ideationally, the semiotic modes or materialities engaged in the evolution from 'Given' towards 'New' are coherent across the text (and its division in chapters). Textually, the integration of these materialities into the same interface as the main narrative (with dynamic transitions scaffolding the process) also plays a role in the text's cohesion. This cohesion also goes in line with the ISDoc's intent in reducing user control. Finally, the testimonial presence of ISS with an interpersonal focus contributes to the reduced interaction possibilities offered by the text, which further redirects the user attention towards the narrative's content.

In line with similar conclusions drawn by Adami (2015, p. 147) for other genres, all of these considerations lead to the cataloguing of *The Last Generation* as an example of a text in which the aesthetics of interactivity (that is, all the different ISS and opportunities for interaction available to users) contrasts with the closed structure through which users can navigate, firmly centred towards the main narrative, as discussed in the next section.

Narrative design

The narrative structure of *The Last Generation* was defined as two-levelled. A first level comprehends the lexias which contained the audiovisual narration, and the second includes those lexias that provide a deeper level of scientific content. In line with previous discussion on ISS, it is worth recalling here that these levels are associated with the interactivity required to access the lexias: the first level can be navigated through syntagmatic interaction with the text, while the second requires paradigmatic interaction with the aforementioned second subset of ISS. Moreover, the functions of the lexias are highly cohesive with the semiotic modes and materialities involved. As anchors of the main narrative, syntagmatic lexias are mostly consistent with the 'Audiovisual narration' mode, with reduced instances of 'Data visualisation' and 'Cartography' embedding. In the same way as for

semiotic modes, this organisation suggests that syntagmatic lexias occupy the main position in ISDocs where the ‘Audiovisual narration’ mode is favoured.

On the other hand, paradigmatic lexias, as responsible for the provision of informational depth, make use of these (except the ‘Audiovisual narration’) and the rest of semiotic modes to complement the information provided in the main narrative. Narrative vectors play a fundamental role in this respect: transitions in which users cannot interact with the syntagmatic lexias of text in a coherent way lead to the possibility of accessing paradigmatic lexias. In this sense, the platform makes a clear effort to draw consequences about the subject matter not only at the ideational level (for instance, what would happen to the island if the sea level increases?), but also includes vectors that prepare users for how to deepen in this information through an incoming change at the textual level. A final consideration regarding the arrangement of the lexias concerns their low modularity: they are organised in a linear manner, which limits the possibility of freely accessing them at any point / via any ISS once they have been skipped.

Relating to this, the narrative design of the protostory (Koenitz, 2023) also shows very low modularity: the design clearly revolves around the chronological exploration of the chapters, which are joined in the main interactive board. As exposed in Chapter 5, users can freely decide which of the chapters to visit through this board. Ideationally, accessing a chapter other than ‘Present’ as the starting point proved to be not a successful strategy, since the other two chapters are built on assumptions drawn chronologically in the narrative. Textually, the presence of the credits screen at the end of the ‘Future’ chapter also reinforces this idea, and contributes to the contrast between the ‘aesthetics of interactivity’ and the real opportunities for free interaction on the part of users.

Social action: Documentary Contract

Chapter 1 established that the fulfilment of the documentary genre could be equated with the so-called ‘Documentary Contract’ (Skartveit, 2007). The Contract consists of two clauses: the ‘Truth’ clause, by which documentary contents are assumed to be evidentiary and factual, and the ‘Taking action’ clause, which

implies that the audience must participate in the construction of their own knowledge and conclusions. In the context of Web 2.0 and the evolution into IDocs, I argued that the clauses had undergone similar developments: now, taking action would imply a *physical* manipulation of the documentary's contents, afforded by the interactivity of the digital medium and a *kairos* of 'participatory culture' (Jenkins, 2006). Following the interpretation of the previous issues under the hypersemiotic framework, it is worth considering how social action is enacted in ISDocs such as *The Last Generation*; that is, how the 'Truth' and 'Taking action' clauses are accomplished for a science communication genre in an interactive context.

For the enactment of the first clause, it could be argued that the text follows very closely the conventions of factuality that are used for the matrix genre of the SD. As specified earlier, most of the semiotic modes in the ISDoc correspond to instances of transmediation; moreover, the favoured mode is the 'Audiovisual narration', which is closer to the medium that can canvas the production of SDs. In that sense, the choice of materialities and the discourse semantics they structure reinforce the idea that what is presented is indeed factual knowledge. The anchoring narrative is supported by the 'Audiovisual narration' mode and shows both the contextualisation provided in the black boxes and the interviewees' testimonies; for the discourse semantics of the mode, users interpret these scenes as information that pivots between the subjective (but factual) report of the children in the Marshall Islands and the narratorial contextualisation for their experiences. The first clause, in relation to the factuality of scientific information, is enacted through the inclusion of the other semiotic modes. 'Data visualisation', 'Cartography', and 'Photographic evidence' present data and factual evidence about the documentary's subject matter and main hypothesis: that the Marshall Islands may disappear as a result of climate change. Thus, the aforementioned semiotic modes include information such as interactive graphs that show the increase in sea levels, the effects of nuclear bombing of the atoll, or photographs showing the decay of local marine flora. The 'Written evidence' mode directly

quotes expert voices in different fields to contribute to the ‘Truth’ clause, thus redirecting expertise to external and credited agents.

For the second clause, two main ideas stem from the previous analysis: first, that the text is divided into two levels and that the access to scientific contents is completely optional; second, that the aesthetics of interactivity are greater than the actual access that users have to content manipulation. For the former idea, it was established that syntagmatic modes contain the main narrative, and that only upon paradigmatic interaction with certain ISSs (strategically located in narrative vectors) could users access additional contents that provides more scientific evidence; also, that the platform encourages a linear and chronological navigation of the text’s lexias. In relation to this, the aesthetics of interactivity feature a wide array of ISS with different forms and effects that were proved to be highly cohesive both ideationally and textually. Despite this, the linearity of the narrative and the non-existent option to interact with the text’s lexias or with other users set the text as an example of Gaudenzi’s semi-closed model for IDocs. I argue that the reduction of users’ options fulfils a main objective: to draw the user’s attention more to the subject matter and content of the document than to its form. This is in line with Holsanova (2014) on the effects of user attention in multimodal genres. As this author puts it, “the freedom of choosing entry points and reading paths is not an optimal strategy for attracting readers to stay with a complex material and get a deeper understanding of its contents” (p. 17). The reduction in choosing these ‘entry points’ in *The Last Generation* (three chapters and no free arrangement of lexias; also, chronological order is encouraged) may be a strategy which may help provide a deeper understanding of contents.

Conclusions on *The Last Generation*

As an exemplar of the ISDoc genre, *The Last Generation* is a text that establishes a firm hierarchy of meaning-making resources. This is achieved through the following strategies. First, the text clearly favours the ‘more traditional’ semiotic mode of ‘Audiovisual narration’ and reduced the combination among other modes. Second, it reduces interactive possibilities in terms of ISS forms and effects and user manipulation of the contents. Third, it establishes clear and low-modular

narrative paths within which paradigmatic lexias appear at specific moments and with a clear intent of expanding technical information. Fourth, it maximises the impression of factuality through a ‘discourse of sobriety’, in which the interviewees became the narrators of the story. Fifth, and while reducing users’ *actual* physical / interactive opportunities for taking action in the platform, the ISDoc enacts the second clause of the Documentary Contract by establishing a scaffolding of ‘core’ story contents with an emotional appeal and other factual contents which complemented the story by providing scientific information.

6.1.2 Case Study: *InfoAmazonia*

Semiotic modes

InfoAmazonia is the ISDoc whose choice of semiotic modes departs most from the idea of ‘documentary’ as in its matrix genre. The main semiotic mode, ‘Written evidence’, articulates an ISDoc which, more than a single text, conforms to what I introduced in Chapter 5 as a ‘documentary genre set’ following Devitt’s (1991) terminology. In light of the case study analysis, I would argue that Devitt’s definition of a genre set as ‘bounded constellation of genres’ could be extrapolated to the kind of relations that the genre exemplars of *InfoAmazonia* develop within the ISDoc.

The key factor for this status as ‘documentary genre set’ is conferred by the platform’s combination of semiotic modes, or their status as embedded genres. While there may not exist many at display (only 4), their appearance in combination with the main ‘Written evidence’ mode is pervasive throughout the texts, and, especially, in the so-called ‘Long forms’ (longer excerpts of texts which usually included hyperlinking to other texts within the webpage and a greater density of materialities involved in their interface). Harnessing the potential of the digital medium, the inclusion of interactivity for the semiotic modes of ‘Photographic / Audiovisual evidence’, ‘Data visualisation’, ‘Cartography’ (and even instances of the ‘Written evidence’ mode, such as hyperlinks and pop-ups) deepens the possibility for the material substrate as anchors for meaning creation.

This extended capability to create meaning (through both interactivity and mode combinations) implies that the discourse semantics of the semiotic modes serve more functions within the text. In other words, by expanding the range of communicative functions of the semiotic modes, users interpret and assimilate these cues as part of the genre's goals and social action. The 'Data visualisation' mode can be taken as an example of this happening. Of course, the semiotic mode is perceived by the users as factual data that support the text's goal. Nonetheless, and through the use of hyperlinking, interactivity, and combinations with other modes, the semiotic mode is able to incorporate the traceability of its source data, and even a specific, independent place within the platform (specific subsites which contain raw data files). More than the visual dashboard (Li & Liu, 2016) that is present at simple glance, the semiotic mode represents only a vision of wider sets of data that is made accessible for users. All of these characteristics of independence (in terms of how the semiotic modes would work outside the ISDoc text), data traceability and user manipulation can then be said to constitute examples of embedded genres within *InfoAmazonia*. 'Data visualisations' catalogued as 'subsets of visualisation research' can cater for both expert and non-expert audiences (Grainger et al., 2016, p. 301); in *InfoAmazonia* the design of the mode takes into account the 'communicative context, visualisation goals' (p. 301) and how different audiences converge in the text³⁷. As part of the hypersemiotic operations implied in navigating the ISDoc, the working together of these semiotic modes and embedded genres tie the documentary materials together, thus conferring its status as 'documentary genre set'.

Media transformation

Semiotic modes in *InfoAmazonia* are instances of transmediation. No emergent genres or semiotic modes are included in the platform, despite the intense combination of modes and hyperlinking. The first impression with the platform is that it is an online news site being navigated. This could be the intended design on

³⁷ For 'Cartography', Roth (2013, p. 70) also suggests a variety of goals that can be extrapolated to how the semiotic mode is structured in *InfoAmazonia*: "the utility of cartographic interaction for confirming empirical and model based analyses, for synthesizing analytical results into coherent arguments, and for presenting results to academic and public communities".

the part of the authors: by including ‘familiar’ genres and modes (in hypersemiotic terms, genres whose navigation is similar to webpages with less interactive possibilities), there is an increased sense of cohesion of the contents, despite its later expansion through the hyperlinked and interactive affordances of the materialities.

Interactive Sites/Signs

ISS in *InfoAmazonia* participate in the platform’s intent to build an easily navigable interface which, at the same time, also provided layered / scaffolded interactivity for expert and non-expert audiences to achieve their communicative goals and desired level of informational depth.

As Chapter 5 introduced, what derived from the analysis of ISS in the ISDoc was that the platform made use of all available prototypical forms, actions, and effects that can be found in other digital genres. The ISS structure of information is similar, in terms of arrangement, to a typical online news site, for instance. To cater for that prototypicality, I suggested classifying ISS found within that interface as Category 1 and 2 ISS, the former including ISS that are located in all instances and sub-genres (such as ‘News’) of the platform, and the latter including ISS that are not genre-specific in its ideational level but are constrained to specific sub-genres. As part of that prototypicality, the expected ideational, interpersonal, and textual effects upon interactions are highly cohesive: Category 1 ISS are mostly aimed towards the textual metafunction, thus structuring the basic layout of the platform’s contents. Category 2 ISS cover the three metafunctions through hyperlinking, remediating scientific knowledge (through pop-ups) and also enabling user interaction through comment sections.

Category 3 ISS can be considered the most interesting type of ISS from a hypersemiotic point of view. Ideationally, they provide a greater level of interactivity for the instantiations of embedded genres / semiotic modes. For instance, they activated the interactivity of the ‘Cartography’ mode by including dynamic map annotations; or provided additional data upon hovering on interactive instances of ‘Data visualisation’. It is certainly difficult to establish clear

boundaries for how ISS act within ensembles, and their accomplishment of metafunctions should certainly not be understood as fixed categorisation. Rather, and as the following discussion will argue, they come to interact dynamically between them.

Category 3 ISS provide a noticeable expansion of the platform's contents through the ideational function: as a general conclusion for this and other ISDocs, more opportunities to *paradigmatically* interact with semiotic modes lead to greater levels of informational depth. In *InfoAmazonia*, this goal was achieved through a combination of the ideational and textual metafunctions. Apart from providing direct opportunities for interaction with the materialities, the platform arranges the ISS as textual 'hinges' that served to structure the plethora of source material and related sub-genres in the web and scaffold users' way into these data. This was more noticeable in Figures C.2.19, 20, and 21 in the previous chapter. There, the instantiation of the 'Cartography' semiotic mode includes ISS that not only provide an interaction with the map's contents, but also are structured in a way that this interaction leads to deeper levels of content that are redistributed in other sites of the platform, from the first levels of interactivity, including simple annotations on the interface, the platform scales to the general map ('Discovery' category) that contained the raw data and additional map filters. All of this was supported by the endless possibilities for interactive manipulation of the platform's contents that users can achieve in the latter stages of the interactive scaffold.

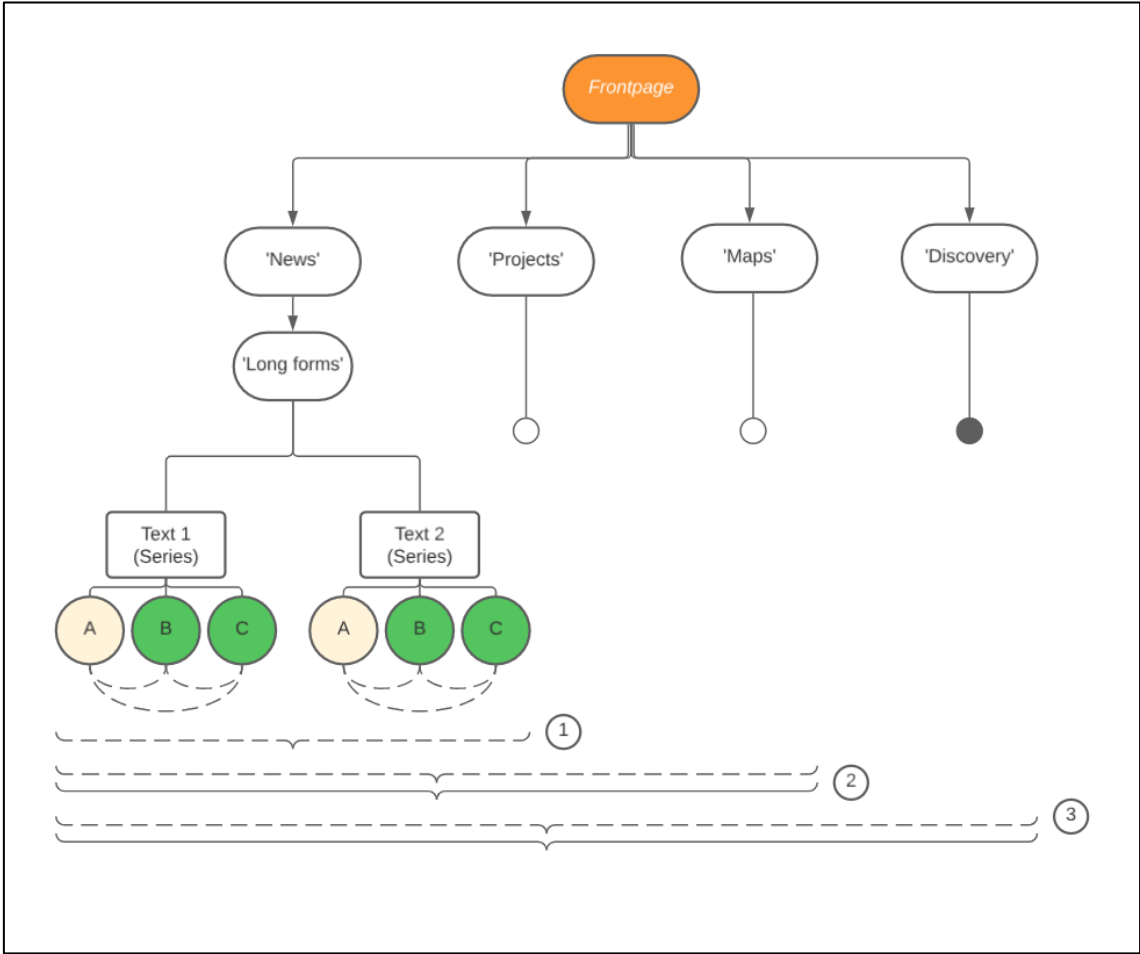
Interactive possibilities are thus high and varied in *InfoAmazonia*, which, together with the existence of genre-related ISS, illustrate the interactivity of ISDocs and how the genre may reduce the user's learnability of the platform and increase the hypersemiotic load that is required to make sense of the platform's contents; for expert audiences, nonetheless, these enhanced interactive possibilities provide the necessary openness for them to achieve their desired goals.

Narrative Design

In light of the case study research, I would also argue that the particularity of the design of *InfoAmazonia* was that it corresponds to Manovich (2002, 2014)

definition of the ‘trim bin database’. In Chapter 5, I suggested that the particularity of this ‘narrative’ structuration lied in the way that the platform’s texts / lexias established connections not only textually, by examining hyperlinking possibilities through ISS, but also ideationally (by the topical-navigational connection discussed in the previous section). It is useful to consider the overall instantiation of *InfoAmazonia* with the resulting textual and ideational connections, as was shown in Figure 6.2

Figure 6.2
Instantiation of InfoAmazonia



Note. Ideational and textual relations of semiotic modes with the platform’s categories.

As defined in levels 2 and 3, the relation that the single texts (and semiotic modes, marked as ‘A’, ‘B’, ‘C’) established within the platform occurred both ideationally (i.e. through subject matter established in the ‘Series’ or the Amazon area, in general; dotted line) and textually (i.e. through hyperlinking; continuous line). It

was also claimed that sequentiality was not achieved through a linear arrangement of contents on the part of the creators; rather, the granular structure depends on the degree of user interaction with the ISS. This implication goes in the line of what was advanced in Chapter 3 within this thesis: that ‘linearity’ is a construct that entirely depends on how users provide ‘sequentiality’ to the content of the text, and even more so in the case of ‘trim-bin databases’.

This narrative design, in line with the ISS structuring of information, is what makes *InfoAmazonia* an instance of an ‘open’ documentary in Gaudenzi’s classification. The platform is scaffolded in a way that users, when interacting with a mode, face the decision to keep interacting and thus accessing deeper layers of information. Texts themselves involve multiple opportunities for the switch between browsing-navigation stances (Finneman, 1999), as the aesthetics of interactivity are present in most of the instantiations of the semiotic modes / embedded genres. Overall, it can be argued that, without paradigmatically interacting, *InfoAmazonia* would cease to be ‘documentary’ and would merely become a collection of texts with included digital features for visualisation and navigation.

Social action: Documentary Contract

The enactment of the ‘Truth’ clause of the Documentary Contract in *InfoAmazonia* stems from different design choices. Firstly, the ascription of the platform to the Open Science movement is evident in that the foundations for it were open-sourced. Cartographic and other raw data feed the embedded genres that appear in the texts in a remediated manner. This leads to the second design choice: by constantly relating the semiotic modes and textually redirecting towards the source data, the platform crafts a discourse inherently based on the truth of its arguments. Thirdly, and in terms of the narrative modes (Van Dijck, 2006) for the ISDoc, the combination of journalistic discourse with the inherent academic reporting of data establishes the factuality of the claims for the former. Even for the ‘Speculative’ mode (and specific texts tagged as ‘Opinion’), the combination of semiotic modes establish the factual basis for the arguments and hypothesis and draws audiences into the author’s position.

The discursive ‘Taking action’ in *InfoAmazonia* is dependent on the ideational-textual scaffolding designed by the platform. To picture this: the navigation through any text (mostly based on the ‘Written evidence’ mode) included the optional interaction with other semiotic modes. In turn, interacting with these ISS allows access to other texts, contents, or materialities which increase in the depth of information and scientific contents provided. Despite refusing to paradigmatically act on these ISS, users could still navigate texts in which syntagmatic interaction already provide them with the combination of modes recurrently geared towards building factuality. In all, *InfoAmazonia* is a genre exemplar that acknowledges that, in its documentary social action, the discursive ‘Taking action’ needs to cater for the necessities of different audiences in the ‘context collapse’ (Marwick and Boyd, 2011). As such, it scaffolds access to these contents (and thus, the hypersemiotic exploration) by gradually opening access to increasingly academic / scientific information.

Conclusions on *InfoAmazonia*

Although not prototypical, *InfoAmazonia* corresponds to an example of ISDoc whose design takes into account the accomplishment of the Documentary Contract in the context of digital genres and the Open Science movement. To do so, *InfoAmazonia* includes extended versions of semiotic modes and embedded genres through the use of interactivity, and then integrated them into the main interface of the ‘Written evidence’-based texts, thus creating a ‘documentary genre set’. In addition, it uses a similar web page layout and semiotic modes to other traditional genres to facilitate navigation through the platform. Moreover, it uses specific genre-based ISS which allow scaffolded access to materialities built in the semiotic modes and other sites within the platform. In fourth place, It is narratively designed around ideational-textual relations between embedded genres and the overarching topic of the Amazon region; and presents factual information through open-sourced data and its combination of semiotic mode, while arranging a multi-layered structure in which opportunities for the discursive ‘taking action’ were adapted to the desired informational outcomes expected by expert and non-expert audiences.

6.1.3 Case Study: Behind the Dirty Gold

Semiotic modes

In *Behind the Dirty Gold*, the narrative revolves around the use of the ‘Audiovisual narration’ semiotic mode. Chapter 5 analysed the configuration of the mode around different instantiations, which in turn consisted of different combinations of materialities (captions or interactive pop-ups, for instance). It can be concluded that, in a way, this structuration around the ‘Audiovisual narration’ mode approaches the ISDoc to the conventions of the Science Documentary: in *Behind the Dirty Gold*, the impression of subjectivity is reduced by including the narrator in specific instantiations (the pop-ups) of the main semiotic mode, and positioning users as first-person participants of the journey through the South American countries. While readily using the combination of modes and materialities as a strategy for meaning making, there were two issues introduced in Chapter 5 that hinted at the difficult classification of what corresponded to semiotic modes and what corresponded to *instantiations* of those semiotic modes.

The first of the issues concerned the role of the ‘interview simulations’ within the ‘Audiovisual narration’ semiotic mode. Interviews serve as communicative exchanges by which the interviewers gathered information by eliciting interviewees into sharing their perspectives. While this question-answer exchange is replicated in the ISDoc, what is not reproduced is the users’ enactment of the interviewers’ role in the exchange. In other words, although the *textual* content of the interview genre was transmediated into the ISDoc, this does not apply for all the genre’s discursive functions, since the *interpersonal* function is lost. By ‘lost’ this thesis means that there is no active participation on the part of the users in order to independently conduct the interview. On the contrary, the users can only control the order of pre-set questions and answers, thereby failing to differentiate it substantively from a pre-set narrative. This holds true in the context of the mobile phone simulations as well: the communicational value of the *personal*

exchange³⁸ is lost in the ISDoc, where the message does replicate the material and discursive features of the independent semiotic mode, but fails to establish *real* communication with a *real* interlocutor. In this respect, the *interpersonal* function is lost in favour of a *textual* and *ideational* enactment of the role of interlocutor (and narratorial voice). By these means, as this case study illustrates, the ISDoc harnesses the multimodal affordances of the digital medium to introduce different ‘narrative vectors’ (Koenitz, 2023) and increase the sense of authorship over the narrative.

The other issue concerned the extent to which it collided with the classification of other semiotic modes, more specifically, the ‘Written evidence’ mode. For this mode, the analysis of the case study illustrated the extent to which similar materialities could fulfil different communicative functions through distinctive discourse semantics. Chapter 5 defined a specific instantiation of the mode as the lateral black-box represented in Figure 7, undoubtedly sharing features with the narration box included in the ‘Audiovisual narration’ mode. While these modes share similar materialities, the discourse semantics are not interpreted in the same manner as for instances in the ‘Audiovisual narration’ mode. The ‘Written evidence’ instances do not provide any background information to the narrative, nor function as narrative vectors. Rather, they are remediated explanations of content mentioned in the narrative. It is possible that simultaneity (that is, the coexistence of different semiotic modes that are anchored in similar material expressive resources) is the cause for these blurry boundaries in defining the modes. A comparison can be drawn with the case of the Glossary (Figure 8, Chapter 5). These texts (the definitions) are taken to be exclusively factual, informational texts, which also have an explanatory function for audiences. Their expressive resources are not medially transformed and, as a complete semiotic ensemble, they did not play a role in the narrative per se – in spite of them bearing an ideational

³⁸ This does not mean that the ISDoc genre (the platform, the creators, the enacted characters in *Behind the Dirty Gold*) does not *communicate* with the users: it does, but at a textual and ideational level. For both simulations to be complete semiotic modes, in which all the communicative functions (including the interpersonal) are enacted, the ISDoc would have to include other genres in a wider ISDoc genre system, such as a Q&A forum, or a mailing list.

relation to the topics discussed in the ISDoc. But since simultaneity with the 'Audiovisual narration' semiotic mode does not occur, these texts are not bestowed with the aforementioned narrative-structuring qualities. Thus, they clearly establish the differences in terms of discourse semantics and conform to an independent semiotic mode within the ISDoc.

Media transformation

The role of the 'Audiovisual narration' mode in *Behind the Dirty Gold* corresponds with an instance of transmediation of source material from the Science Documentary. Interactivity allows for the inclusion of different choices and the aforementioned simulations, and, in the case of the phone messages, it was argued that they resembled an instance of media representation. Regarding the remaining semiotic modes ('Written evidence', 'Photographic evidence', 'Cartography'), the media transformation into the digital environment, apart from providing users with increased control about the pace of content delivery and the platform's contents, also allows more possibilities for remediation of content through hyperlinking.

Interactive Sites/Signs

ISS in *Behind the Dirty Gold* play an ancillary role in supporting the immersive effect of the narrative. As discussed in Chapter 3, ISS are defined not only by the immediate effects on the materialities of the interface, but also for how they are used as anchors for the structure of the text. In this ISDoc, ISS play an evident role specially in their textual metafunction: the boarding panel that controlled the access to different countries / chapters exemplified this use. In fact, this suggests that the ISDoc genre employs ISS to provide a structuration for the wide arrangement of lexias that were present in the platform. For this purpose, it is particularly noteworthy that ISS also play a role as narrative vectors. Chapter 5 analysed how vectorial ISS functioned as 'dramatic points' (Koenitz, 2023) that drew users' necessity to interact with the platform in climactic moments of the narrative. As such, vectorial ISS could be said to enact a dual function: textually, as

structural hinges of the narrative, and ideationally, as enhancers of the dramatic points in the story.

On the part of user control afforded by ISS, *Behind the Dirty Gold* is an example of ISDoc in which the aesthetics of interactivity contrast with the actual control over the content of the platform. As seen in Chapter 5, some of the vectorial ISS (especially in interview simulations) only included one option for users to ‘choose’, and most of these decisions usually involve two choices at most. The reduction in ‘actual interactivity’ (Alkarimeh, 2019) can be associated, in this ISDoc, to the reduction of endless possibilities that could happen for a platform with a high number of lexias; nonetheless, *Behind the Dirty Gold* crafts a narrative structure in which the ‘aesthetics’ of the ISS augment the levels of ‘perceived interactivity’ despite not always leading to meaningful interaction with the contents.

Narrative Design

The most characteristic design feature of *Behind the Dirty Gold*’s narrative, and which may be at odds with what was discussed about the reduction of narrative possibilities, are the two ways of navigating the platform. The first procedure involves accessing any chapter at any time through the ‘Introduction’ ISS; the second, by following the pre-designed paths through the vectorial ISS. In the case study it was evident that this design choice put users in charge of deciding the sequentiality they wanted to assign to the narrative, but it is definitely contrary to the platform’s efforts in reducing other parts of the narration through ISS.

By assuming the second navigational paths, users can follow an overall syntagmatic structure with reduced points to meaningfully choose between differing chapters/episodes. This does not mean that looping is avoided. In fact, some of the paths, especially in the later parts of the narration, came to be repeated endlessly, perhaps as a result of design errors. This increases the hypersemiotic effort that users can invest in the platform, since navigating interfaces which do not address the communication of uncertainty led to lower attention levels and skewed visions about the overall subject matter of the genre (Fischhoff and Davis, 2014). The fact

that the platform does not have a definite ending contributes to the looping and to the increase in uncertainty about the navigational possibilities of the ISDoc.

Despite these issues, the arrangement of the lexias in the protostory offers sufficient paradigmatic interaction on the part of the users for a structure with over 34 nodes. User control is limited through the two-pronged design of the navigation path, thus reducing the narrative possibilities over a seemingly endless modular structure.

Social action: Documentary Contract

The accomplishment of the ISDoc genre's social action is, as shown in the case study of *Behind the Dirty Gold*, dependent on how narrative modes and the interactive affordances contribute to the impression of immersion, and thus, factuality. As analysed in Chapter 5, the ISDoc only featured instances of the 'Expository' and 'Explanatory' narrative modes. The semiotic modes that configure the platform are concerned with both presenting the trip through the South American countries and providing specific scientific information about the social and environmental problems associated with gold mining. Moreover, the presence of the Glossary, Map and 'Diary entries', which were closer to the 'Explanatory' narrative mode, provide non-expert audiences with remediated information. The 'Speculative' mode is completely elided, and it is noteworthy that there are no instances of the 'Reconstructive' mode (which would provide a historic background for the problematics in the area) other than sporadic comments made by interviewees. In a sense, this helps reinforce the immediacy of the experience, but could hinder users from obtaining a complete overview of the historical evolution of the subject matter. Nonetheless, there is a sense that the rest of the semiotic modes ('Photographic evidence' and 'Cartography') are not exploited fully for the experience. It is likely that the platform tilts towards journalism rather than scientism, thus favouring the 'Expository' narrative mode. In any case, the elision of the aforementioned narrative modes may be related to the reduced use of the secondary semiotic modes' functionalities in ISDocs. In this line, the discursive 'taking action' on the platform is more concerned with the cohesion of between the lexias than providing users with meaningful interactive options to enhance

their scientific knowledge of the topic. Everything in *Behind the Dirty Gold* revolves around how users navigate the granular structure and are able to extract conclusions and ‘pick-up’ scientific information.

Conclusions on *Behind the Dirty Gold*

The status of *Behind the Dirty Gold* as a text enacting the social action of the ISDoc genre is granted through a number of characteristics. First, in general, and given the role of the other semiotic modes, the narrative is crafted through the different instantiations of the ‘Audiovisual narration’ mode, omitting the narrator’s voice in favour of creating the sense of immersion that is achieved through the simulations (interviews, phone messages), interactive choices, and the use of the 2nd person. Secondly, the transmediation of the text’s semiotic modes into Web 2.0 brings about greater user control on the content and increased opportunities for remediation. Third, it keeps a high level of perceived interactivity by using ISS as structurers and narrative vectors, while restricting users’ free manipulation of lexias. Fourth, it offers users different navigational options and allows two-pronged interaction even in the pre-defined path while providing a coherent scaffold through the narrative (despite errors in looping lexias). Finally, it crafts the factuality of the platform based on the immersive experience of the ‘Audiovisual narration’ mode and the tendency towards the ‘Expository’ and ‘Explanatory’ narrative modes; all of this while reducing the interactive affordances of secondary semiotic modes and the possibility for users to expand their knowledge about the subject matter outside the narrative, thus limiting the possibilities for discursive ‘taking action’.

6.2. TOWARDS A CHARACTERISATION OF THE ISDOC GENRE

The Last Generation, *InfoAmazonia*, and *Behind the Dirty Gold* were the texts that, after undergoing a filtering process, were selected with a view to characterising the ISDoc genre. The main requirements were the fact that they belonged to STEM topics (in order to cater for the ‘S’ in ISDoc), and, more specifically, that they aligned with the ‘Environmentalism’ and ‘Conservation’ tags. The third

requirement was also their technical accessibility and compatibility. Of course, aiming at providing a general characterisation is a complex endeavour. As suggested here, the selected cases did not account for the wide variety of communicative strategies that the ISDoc, as a subset of the IDoc genre, can deploy. Still, the strategies used in these texts suggest that there exist different trends and common procedures that serve to anchor the ISDoc genre, as explained below.

Semiotic modes

Semiotic modes in ISDocs, as the findings of the case study indicates, tend to be limited to a small set of them. In total, only 5 modes (and their variations in form and function) were observed to configure ISDoc texts: 'Audiovisual narration', 'Data visualisation', 'Cartography', 'Photographic evidence', 'Written evidence'. It could be argued that the type of documentary mode (in Gaudenzi's terminology) conditions the main semiotic mode that is used to articulate the narration. In semi-closed models such as *The Last Generation* or *Behind the Dirty Gold*, the main semiotic mode was 'Audiovisual narration'; in the open model, in *InfoAmazonia*, it was 'Written evidence'. Probably, the responsibility ceded to users is related to this design choice. 'Audiovisual narration' is the semiotic mode which more resembles the traditional 'discourse of sobriety' (Nichols, 2001) of the Science Documentary. More than that, and given the usually low degree of interactivity that can be built on the mode (other than play/pause buttons), the use of this mode suggests that the transmission and construction of arguments related to scientific dissemination is dependent on the creators. On the other hand, open models such as *InfoAmazonia* needed to use semiotic modes (in this case, 'Written evidence') which allowed for and required significant user interactivity to navigate the text (trim-bin database design Manovich, 2002, 2014; and high modularity also suggest this³⁹).

³⁹ Outside this investigation, but quite remarkably, the famous ISDoc *Bear 71* is articulated through user exploration of a 'Cartography' semiotic mode. It could be argued that, depending on the level of expertise of the audiences, *InfoAmazonia* could be tackled in the same way through the 'Discovery' site; in any case, it confirms the idea that certain semiotic modes are more suitable to yield responsibility to users than others.

For the rest of the semiotic modes, it is worth noting that this thesis tagged them with the 'evidence' label in some instances. This quite clearly points towards the kind of function these modes play in the narrative: the inclusion of different semiotic modes served to provide different points of view / manners of interaction for the documentary to reinforce its sense of factuality. This finding is related to the manner in which ISDocs adopt a combination of semiotic modes. Instances of this happening are not widespread in the semi-closed models: in *The Last Generation* and *Behind the Dirty Gold*, the only instances of combination / overlapping within the same lexia were reduced to groupings of 'Data visualisation' built on the 'Cartography' semiotic mode. This does not mean that these models in the ISDoc genre cannot develop more combinations. In fact, the case study research suggests that several combinations are more readily used due to similarities in materialities or compatibility for users to interact with. On the other hand, *InfoAmazonia* deployed more instances of mode combination: usually, navigation through the sites allows users to syntagmatically interact with ISS that contained other semiotic modes (and whose function was to complement and provide factual information for users).

Lastly, the way in which semiotic modes were hierarchised in the platform provides insights into the processes of hybridisation that occur in the ISDoc genre. In Bateman's framework, genres select, from the availability of resources allowed in the canvas of the medium, the most suitable materialities that serve to fulfil their communicative goal. ISDocs evidence that the fulfilment of social action depends on the accomplishment of different communicative goals: they need to be factual and let users construct that factuality, but not at the expense of a reduction in the communication of scientific contents. Achieving the adequate balance between these requirements implies that the semiotic modes and materialities that conform the text develop specific functions that act in accordance with the text's goals. Two factors emerge from this necessity. The first one has to do with the status of these semiotic modes within the platform, and which ones are examples of semiotic modes, and which ones are fully embedded genres. As explored in the case studies, simultaneity (that is, the coexistence of different semiotic modes that are anchored

in similar material expressive resources) and independence (how developed, in terms of informational depth provided, is the semiotic mode, and which place it occupies within the narrative structure) could be the causes for these blurry boundaries in defining the modes. Only tentative answers can be provided to explain this fact. Although future research is needed to verify this assertion, they served to illustrate narrative choices that impact the ways in which the communicative goals are tried to be achieved. Finally, the second factor is related with the hybridising capacity of the genre: different discourses (and interpretations in the discourse semantics of the semiotic modes) are necessarily integrated into the overall text, thus increasing the polyphony in creators and users' interpretation of the genre.

Media transformation

In terms of the processes of media transformation that these semiotic modes undergo, most of the instances identified in the Case studies corresponded to transmediation from the source Science Documentary. It could be argued that the reason for this phenomenon is similar to the choice of semiotic modes in the texts: discursively, the 'discourse of sobriety' and the rhetorical tropes that are traditionally used in the SD are deployed by similar materialities and semiotic modes, but within the digital medium. This thesis, following Miller's (2016) views on innovation and emergence, assumes the former stance: it considers the ISDoc genre as an evolution afforded by technical capacities within a continuum of documentary filmmaking practices that have revolved around the same social action (the Documentary Contract) throughout its development.

What interactivity affords to the genre upon transmediation is mostly user control over the pace of contents. Once again, this can be explained by the preeminent position of the 'Audiovisual narration' semiotic mode and its suitability to maintain authorial control over the platform: in this sense, users can only decide the speed at which these contents are delivered. A second main function of interactivity is scaffolding. As analysed in the texts' 'Narrative Design' sections, the interactive structures that characterise the genre can be understood as paths of lexias (or simply, concatenated interactive choices) which are navigated step-by-step by

users. These ‘interactive scaffolds’ allowed users to access further levels of informational depth in a controlled manner, thus letting audiences decide the stage at which they felt satisfied with the contents learnt / picked up / explored. As such, these scaffolds arise as a result of the digital transmediation of these modes.

A final reflection should be directed at the other side of media transformation, that is, ‘emergent’ genres or semiotic modes. The findings of the case studies are not yet sufficiently supportive to establish what an ‘emergent genre’ would be within an ISDoc text or even a ‘documentary genre set’ (see section 6.1.2 within this chapter). This is mostly due to the difficulties in establishing clear boundaries between semiotic modes, combinations / ensembles of them, and embedded genres. In the same way, there are similar difficulties in discerning what makes these materialities inherently innovative as determined by their communicative goals and social actions. Related to this, it is also worth mentioning that there was an aesthetic side of the issue: what can be considered as innovative, in creative terms, in relation to deploying novel arrangements of materialities that users did not expect / had not experienced / or lack genre uptake to interpret? Once again, this requires precisely pinpointing specific communicative goals that arise from very specific conditions afforded by the medium⁴⁰.

Interactive Sites/Signs

The use of ISS within the ISDoc genre involved examining two variables: how the structure of information is controlled through ISS, and how and to which extent users have control over the narrative.

Regarding the first variable, ISS’s textual metafunction was the most remarkable in the genre: ISS are used to enable changes in the structure of the text, both at a

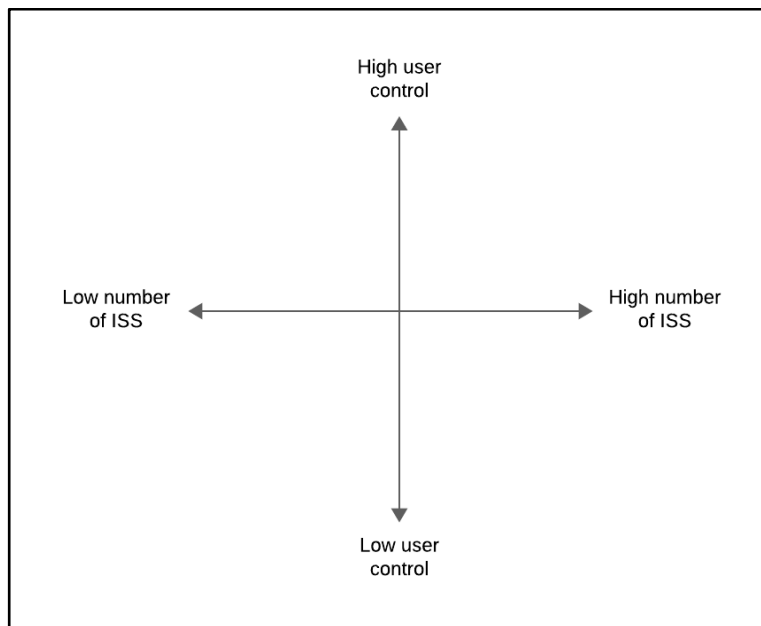
⁴⁰ It could be argued that *Bear 71* could be considered an example in which the main semiotic mode, ‘Interactive Cartography’ is emergent: users access narrative contents and scientific information only when they grasp the navigation patterns of the map and learn that, in line with the ‘Take action’ clause, they are mimicking (and thus, empathising with) an endangered bear in a national park. Still, the different approaches to interactive cartography as a genre or as a ‘tool’ within other platforms such as videogames (see Troups-Dugas et al., 2019) would argue against this consideration of ‘emergent’.

syntagmatic level (within the same lexia) and at a paradigmatic level (in a transition towards another lexia). For instance, in *Behind the Dirty Gold*, ISS were identified as narrative vectors: changes in the countries visited during the journey that articulates the narrative coincided with changes in lexias that needed interaction in specific ISS. In the Given-New relation, ISS were identified to provide cohesion through their regularities in forms, actions, and effects (for the latter, users learn to expect specific changes in the platform as a result of their actions). In *InfoAmazonia*, an interesting finding was that ISS could be associated not only to semiotic modes (for instance, a play/pause button on the 'Audiovisual narration'), but also to specific lexias, sites, or embedded genres within the text. Particularly, the category associated with specific embedded genres was of interest because of the double function they performed: textually, these ISS structure all the sites within platforms which depend on hyperlinking to create large combinations of semiotic modes; ideationally, they scaffold users' way into the contents and control (and let users infer) the level of informational depth they desire to explore.

For the second variable, the presence and effects of ISS lend credence to the fact of how the text yields control over the contents to the user. The key distinction for this design choice was the degree of control that is 'lost' by authors in the process, and how it correlated with the opportunities for interaction in the text. This can be represented through the following figure (see Figure 6.3)

Figure 6.3

Axes for user control – number of ISS balance



The assumption that can be made for the ‘User control variable’ is that low user (or high authorial) control leads to a regulated construction of arguments (Forceville, 2017) and the opposite. Establishing a similar assumption for the second variable (‘Number of ISS’) is far more problematic: as seen in the case studies, there is no correlation between increased opportunities for interaction and more control over the platform contents on the part of the user. Analysing ISS then becomes a matter of identifying the levels of ‘perceived’ versus ‘actual’ interactivity (Alkarimeh, 2019); in other words, whether the aesthetics of interactivity are prioritized over its functionalities (Adami, 2013). Semi-closed ISDocs tend towards low user control and high number of ISS (*The Last Generation* offering more choices than *Behind the Dirty Gold* two-pronged approach for vectorial ISS, the latter being an example of genre ‘lipstick’, Pérez-Llantada, 2013), while open models favour high user control and a similarly high number and variety of ISS.

Narrative Design

Structuring the protostory in terms of lexias showed that this was a valid approach to understanding the ISDoc genre even if they presented different structures. A key distinction in the hypersemiotic framework, extrapolated from ISS theory, was that between paradigmatic and syntagmatic navigation through the platform. In

paradigmatic navigation, the users have ‘actual’ control over the change of lexias, and can choose to interact with them or not. On the other hand, syntagmatic indicates that while users can interact with elements of the text, they don’t have the opportunity to choose between lexias to freely ‘jump to’. This is best illustrated with the case of *The Last Generation*. In this text, users syntagmatically navigate the platform because they have no other choice: the platform clearly sets a point of departure and an ending to any instantiation of the protostory. In some cases, paradigmatic navigation is possible: it offered the users the possibility to access other contents which, nonetheless, did not have an impact on the narrative. At least for the cases of *The Last Generation* and *Behind the Dirty Gold*, this seems a general conclusion for characterising the genre: semi-closed models tend to favour syntagmatic navigation and the following of a more or less pre-defined narrative path, and paradigmatic navigation’s functions involve the access to further levels of scientific content. *InfoAmazonia* favoured a different kind of navigation, but which, up to a certain extent, was similar to the other texts. Of course, the existence of different sites made the text inherently paradigmatic in origin. Exploring the wider ‘Discovery’ map did not follow any pre-determined path, other than the pre-defined hyperlinked stories that could be accessed when selecting specific areas. Nevertheless, in the ‘News’ section, navigation is essentially syntagmatic. As section 6.1.2 in this chapter examined, it is true that the kind of relations established through hyperlinking and ISS require attending to the textual and ideational level, which encompasses increased hypersemiotic effort. But, essentially, texts are meant to have a point of departure, an ending, and different opportunities to interact and expand informational depth in a scaffolded and hyperlinked manner: in a way, despite the overall layout of the protostory, users end up navigating these individual texts in a similar manner. In all, this finding suggests that the process of ascribing sequentiality to digital texts and genres is dependent on users although it could be restricted to linear forms by authors; and that the increase in possibilities for paradigmatic interaction, in line with Canan (2007), was associated with the provision of ‘information from several angles’ more than as a multiplication for novel structurations and instantiations of the texts.

Social action: Documentary Contract

The findings of the case studies showed that the strategies to accomplish the Documentary Contract deployed in the analysed texts seem to be homogeneous within the ISDoc genre. The first 'Truth' clause was enacted through two main strategies: by combining semiotic modes, and by favouring certain narrative modes. As analysed in the three ISDocs, the combination of semiotic modes reinforces the factuality of the claims and usually occurs in a scaffolded manner. For instance, in *InfoAmazonia*, the claims established in the 'Written evidence' mode were supported by other semiotic modes such as 'Data visualisation', which offered remediated and factual scientific information; the platform even relates this information to raw, open-sourced data upon continued interaction. The digital affordances allow authors to construe and demonstrate the truth of their arguments by opening the possibility of including multiple and multimodal sources of information. For the second strategy, the ISDocs seemed to lean towards the use of the 'Expository' and 'Explanatory' modes, which correspond to the more factual description of events and its explanations. The 'Reconstructive' mode was also favoured, but to a lesser extent; finally, the 'Speculative' mode seemed to be less used in the genre, and its instances are sufficiently supported by the combination of semiotic modes to augment its factuality.

Finally, the enactment of the 'Taking action' clause is clearly achieved through the inclusion of opportunities for interaction. Once again, the debate about its accomplishment revolves around the 'actual' level of interactivity that users can access. Nonetheless, and to a greater or lesser extent, all the texts seem to grant sufficient opportunities to interact in a manner that both non-expert and expert audiences can access their desired level of informational depth within the platform. Probably, any design that did not regard 'context collapse' and provided hyperlinked scaffolding to different contents may be essentially detached for the positioning of the ISDoc as an Open Science genre within the 'culture of participation', thus impeding its classification as ISDoc.

6.3. CONCLUDING REMARKS

The work behind this thesis set out to investigate the ISDoc genre under the optics of Rhetorical Genre Studies. Following Miller's (2016, p. 16) claim that in order to comprehend 'genre change and innovation, we need all the analytical tools that we can find', both the definition of the social action, exigence, and kairos, on the one hand, and the development of the hypersemiotic framework, on the other, which implies that the RGS analytical approach adopted should be complemented with specific theories, approaches, and methodologies from other specific fields. As explained in the Introduction and further developed in Chapter 1 and Chapter 2, this thesis incorporated analytical tools from documentary filmmaking and science communication online. In the subsequent sections, I suggest that the cases and examples I examined here may offer insights into these areas of study based on how they are *exemplified* and *challenged* by the ISDoc genre.

6.3.1. Final remarks on documentary filmmaking

This thesis established that the ISDoc genre, as a transmediated form of the matrix documentary genre, was articulated around an also transmediated social action, embodied in the Documentary Contract (Skartveit, 2007). This transmediation influences how the clauses of the Contract are to be enacted in the ISDoc genre.

For the 'Truth' clause, the findings showed that there exists a correlation between how users access ISDocs texts with hypersemiotic affordances and the widely discussed issue of how *expectations* shape the documentary genre. As Nichols (2001) posited, "the constituency of viewers engages the documentary with a 'set of expectations regarding the work's authenticity and veracity'" (p. 36; indeed, one of this thesis's conclusions is that schema play an important role in how users engage ISDocs both in its assumption of factuality and the necessary interaction that will be required by them. The case studies showed that, due to the hypermodal possibilities of the digital paradigm, factuality was built through a display of semiotic modes which, in combination, reinforced the evidentiary nature of the ISDoc. But perhaps most interestingly, the second assumption brings forth the

challenge to how documentary filmmakers address the first clause of the Documentary Contract.

As seen in Chapter 5, I argued that, in ISDocs, the provision of factual information (through semiotic modes) was intrinsically tied to the taking action on the platform and its contents. Not only interaction allowed users to reach different levels of informational depth in a scaffolded manner. More than that, it is perceived or assumed that it is the necessary precondition for the genre to exist. The challenge here has to do with the ethics of *constructing* truth through the assumption of interactivity. I will reference three approaches that deal with similar problematics. Firstly, in Chapter 1, and citing Corner (2018, p. 65), viewers 'are lured' into documentary by an 'emotional compensation' which he calls the 'aesthetic-affective pull'. I believe that this emotional compensation is based precisely on the promissory aspect of interactivity, the aesthetic expectation that it is users that are going to be in control of the narrative. Secondly, and in relation to this, I discussed that the case studies showed an imbalance in terms of the levels of actual interactivity as compared to the perceived interactivity (Alkarimeh, 2019): following the analysis of ISS and the kind of actions and manipulation of lexias they enabled, it was determined that the aesthetics of interactivity surpassed the range of actions allowed to users. Thirdly, and also stemming from the case studies, I analysed how the ISDocs mostly exhibited similarities to Gaudenzi's (2013) classification of 'semi-open' modes of documentary, in which users were granted only limited control over the platform. I think these expectations for agency and authorship, and how some instances come to reduce them in practice, are the challenge to the 'Truth' clause of the Documentary Contract. In a way, audiences can feel 'cheated' in the same manner that they did with mockumentaries. In this case, the potential cheating works covertly: firstly, by the promissory agency that interactivity renders to the user and its posterior reduction, in a process that Cortés-Selva and Pérez-Escolar (2016) qualify as "clicktivism", which means to reduce activism to a mere mouse-click, and it does not represent a real engagement or commitment to the cause" (p. 583); and secondly, by how, in the usual arrangement of interactivity in narrative formats, the factuality of the information

could more readily assumed to be true that in other logical-scientific arguments (Green & Brock, 2000).

The ‘Taking action’ clause, for the ISDoc genre, is contextualised in the *kairos* of participatory culture and the digital affordance of interaction. For the former, the analysis of the rhetorical community of MITODL served to demonstrate that, inherently, different actants participate in the configuration of the genre. For the latter, the ISDoc exemplifies how digital genres readily adopt technological advancements to create new manners of communication. In the same way as the first clause, I believe that how these interactive affordances are exploited and the extent to which users really take action on the platform is the main challenge posed by ISDocs for documentary filmmaking. I particularly choose three concepts that illustrate this issue: ‘chocolate-covered broccoli’ (Koenitz, 2018), ‘lipstick’ (Pérez-Llantada, 2013), and ‘Shiny Things Syndrome’ (Posetti, 2018). All of them evidence an ongoing trajectory for digital genres to feature these technological affordances more for the sake of engaging audiences affectively (and thus falling into the trap of ‘technological determinism’, Vázquez-Herrero, 2021) than to provide effective manners for user participation. Ultimately, this evolution towards forms of popular factual entertainment based on the aforementioned aesthetic pull (what Corner labels as the ‘postdocumentary context’, 2002) contributes to the instability of the genre (Schryer, 1993).

6.3.2. Final remarks on science communication online

The ISDoc occupies a place within other genres for scientific dissemination that have undergone a process of transmediation into the Internet. As this thesis examined, this had several implications relating to the nature of scientific contents, to how interactivity brought about a change in the relation of the audiences with the text, and how creators from different fields discursively contribute to the configuration of the genre. I identified two challenges that the ISDoc opens for scientific dissemination genres: first, concerning issues of *positioning*, and second, regarding the transmediation of scientific discourse and its reception by non-expert audiences.

The first issue related to positioning has to do with how the ISDoc is positioned as an Open Science genre. Chapter 2 examined how the ISDoc's social action conformed, almost univocally, to Vicente-Sáez and Martínez-Fuentes' (2018) definition of Open Science: the 'Truth' clause related to the 'transparent and accessible knowledge', and the 'Take action' related to the 'shared and developed through collaborative networks'. Rhetorically, the ISDoc truly is an OS genre; but discursively, the latter part is problematic: how 'collaborative' the ISDoc genre is. Once again, this debate has to do with the degree of agency allowed to users, but, as the analysed ISDocs show, this issue may be at stake with the effectiveness of scientific communication. The second issue is more related to the concept of 'positioning' developed by Hyland (2015) and the ISDoc rhetorical community. Although scientists are indeed major contributors to the enactment of the genre, how is their *discoursal self* (Ivanic, 1998) constructed through the text? As Tardy (2023) establishes, "genres also offer writers certain roles and identities to take on while restricting others" (p. 12). Are these roles restricted in the ISDoc? As seen in the case studies, *InfoAmazonia* featured instances of research being carried out through the 'Explanatory' narrative mode; in *Behind the Dirty Gold* and, to a lesser extent, *The Last Generation*, expert voices featured in very specific moments of the narration appeared to be subordinate to the narrative structure. The variability of the genre leaves this issue open, but I suggest that, by construing these 'discoursal selves' more explicitly, maybe the scientific / academic effort of the genre would be reinforced and thus stabilised.

On the part of the scientific contents of the genre, I believe that there exist three main challenges. The first has to do with a shift in documentary filmmaking practices as described by Rabiger (2005): "[these practices] have tried to endow their products with this sense of sobriety is visible in the presence of 'tropes' or 'styles' that 'preplan the relationship between words and images'" (p. 369). In the case studies, this change in tropes was especially visible in how Van Dijck's (2006) narrative modes need to be reinterpreted for the ISDoc genre. Moreover, it is still difficult to classify the great variety of functions that semiotic modes perform in four modes, and these could be further reinterpreted to cater for the variety of

participants in ISDocs' rhetorical communities and the processes of hybridisation that affect the genre.

The second and third issues are interconnected. As I argued in section 6.3.1, the communication of these scientific contents needs to consider the intrinsic persuasive power of the structure upon which they are built (Dahlstrom, 2013; Green and Brock, 2000). The challenge for ISDocs creators, then, resonates in the accomplishment of the 'Truth' clause: how can documentary and ISDocs develop and communicate awareness about this inherent persuasiveness? On the other hand, this persuasiveness may be limited in that it is towards the full narrative (the story), and not towards the scientific contents themselves, that audiences' attention is redirected. This echoes Forceville's (2017) words about the genre: interactivity and narrative "proportionally reduce the maker's power to argue, and considerably increases the risk that the user will prematurely stop engaging with the documentary – or not even begin to do so" (p. 8). As such, ISDocs need to carefully address the balance between self-conscious truthfulness, persuasiveness, and user engagement. It is especially through this last concern that a final issue arises: the hypersemiotic process of navigation of these interactive narratives is directly related to how users engage documentary. The concept that is most readily used in literature about transmediated semiotic modes is *uncertainty* (Gustafson & Rice, 2020; Grainger, Mao, & Buytaert, 2016; Roth, 2013); as such, I find it a useful metaphor that encapsulates (as the title for this work reflects) one of the major challenges for ISDocs, that of the cognitive side pinpointed by the hypersemiotic framework; and how it comes to be a design feature of a genre that juggles between epistemic and scientific issues for the enactment of its social action.

6.3.3. Final remarks on analytical tools in RGS

In this thesis, the methodology for analysis of the ISDoc genre drew on the tradition of RGS, and, more specifically, was inspired by studies such as Miller and Shepherd's (2004) analysis of blogging and Kelly's (2014) research on parascientific genres. This thesis's approach to the characterisation of the kairos and social exigence of the genre required, as suggested by Miller (2016), that a revision of different fields and approaches should be carried out. First, the evolution of the

documentary genre, its social action, and the context of reception; second, the position of genres for (para)scientific communication online; third, the material characteristics of the medium that enabled the transmediation of the genre and the accomplishment of its social action. The last point required the necessary integration of other linguistic approaches. I highlight the works of Elleström, Bateman, and Adami, and how they contribute, from different lenses, to the understanding of genre evolution in the digital paradigm: respectively, to explain processes of media transformation, to structure the way in which genres exploit available materialities and enable users' contextual interpretations, and the correlation of interactivity with pragmatics and the (meta)functions it can perform.

These and other theoretical approaches crystallised into the development of the hypersemiotic framework. Its design took into account genre uptake, digital literacy, and potential for repetition, revision, and re-performance of genres; its aim was to develop a scaffolded view (departing from the materialities of semiotic modes, exploring interactivity, and the 'narrative' design of the texts) that explained how the ISDoc's social action was performed through this interactive discourse. As far as hypersemiosis tries to contribute to the understanding of this thesis's target genre and other genres online, I believe that it brings to the fore a necessary condition for RGS to advance and cater for the instability of digital genres. I will draw from Koenitz's concept of 'interoperability' (2014) to label this necessity. Miller's research (among many others) is foundational for this and any other study under the RSG lens to characterise kairos and social exigence. Nonetheless, we need to make RGS studies interoperable and sustainable especially in the frameworks that we use to describe this hybridised, hypermodal, hypertextual, and interactive discourse that comes to characterise digital genres. The hypersemiotic framework is only an instance of how these necessities can be tackled; hopefully, and as I suggest in section 6.3.5, it can be useful for other researchers and further developed to cater from other exigences and structures. If we can establish the kind of approaches that can be integrated in different

analytical tools and make them interoperable, then, RGS will be able to better characterise genres and catch up with the rapid evolution of genres online.

6.3.4. Limitations of the study

While this thesis was successful in proposing an analytical framework of hypersemiosis that could address the analysis of the social action, exigence, and kairos of the target genre, it proved limited in examining two main phenomena that are constitutive of the genre: how rhetorical communities are conformed through discursive actions in the ISDoc texts, and which approach to science communication to non-expert audiences is prioritized, whether Public Understanding of Science (PUS) or Public Engagement in Science (PES).

As Chapter 1 explored, in the context of ‘participatory culture’ (Jenkins, 2006) that characterised the transmediation of documentaries into the Web 2.0 paradigm, the concept of rhetorical communities (Miller, 1994) is helpful to determine the ‘virtual’ relations established in digital genres such as the ISDoc. Following her divide in *taxonomical* and *relational* rhetorical communities, Chapter 4 explored the configuration of a specific ISDoc community, the MITODL, from a ‘social’ perspective: through the definition of the key terms and foundations for the Lab, I analysed the relations that were established between actants, the role that they played within the community, and how these relations and roles were materialised in the discourse of the MITODL ‘About’ section. Nonetheless, what perhaps would have been of more interest would be that related to the exploration of rhetorical communities that could be extracted from the case studies: no analysis was carried out. Several factors conditioned this thesis. Firstly, the choice of ISDocs could have played a major part in this. As seen in Chapter 5, no ISDoc featured a specific place / site / lexia in which top-down communication (that is, from journalists towards audiences) ceased and user-user interaction was encouraged. In other words: no textual instances of user interaction could be analysed to understand their positioning within the ISDoc text (and how this could inform genre analysis). Secondly, and deriving from this fact, the analysis of ISS, especially in their interpersonal metafunction, proved insufficient to overcome this gap. While they provided necessary information about how interactivity in the webpage redirected

directionality towards different actants, they were lacking to provide an exact mapping of the relations established within the text. Miller and Kelly (2016) acknowledge the difficulties in genre characterisation for these virtual communities, and while the concept of *communities of use* favoured a pragmatic approach to understanding these relations (similar to ISS theory), this thesis proved lacking in providing an accurate definition of rhetorical communities as materialised through the target texts' discourse.

The second limitation of the hypersemiotic framework involved the analysis of how science communication was adapted or remediated for non-expert audiences. Chapter 2 provided an overview of how new forms of Science 2.0 exploited digital affordances and the resulting emergence and innovation in these genres. Moreover, specific approaches to science communication combined with journalism were also reviewed, namely Dahlstrom (2013), Dunwoody (2021), and Secko, Amend, and Friday (2013) models (mainly centralised in the PUS and PES stances). The case studies were able to identify which specific parts of the text belonged to authors' intents in communicating science and doing so in a remediated manner. A major point within the hypersemiotic framework was to establish the way in which platforms scaffolded these contents. As seen especially in the case of *The Last Generation* and *InfoAmazonia*, the structure of interactivity and ISS was scaffolded in a way that low interaction with paradigmatic lexias contained the most basic and remediated scientific information. Increasing interaction led to different forms, actions and effects for ISS, which in turn implied accessing more and more in-depth scientific information. In spite of this, this thesis could not provide specific textual analysis of whether these instances of scientific communication corresponded to PUS or PES stances. From the analytical processes explained above, it could be inferred that, while originally favouring PES and the 'picking-up' of science in a para-scientific genre, the affordance of interactivity allows to provide deeper contents for more engaged or expert audiences, and thus provide a continuum into PUS; still, the present research did not analyse the process and how this continuum evolved or worked in the present state of the hypersemiotic framework.

6.3.5. Areas for future research

Based on the limitations for the present study and the potential applicability of the ISDoc genre to different areas, I suggest the following 4 areas for future research, which can be studies under the lens of Rhetorical Genre Studies:

Pedagogical application

The application of ISDocs in learning contexts can cater to different contexts and pedagogical goals. I would highlight four specific foci for implementation. The first one, and perhaps outside the reach of RGS, is that of using ISDocs for purposes of scientific communication, above all understanding (PUS). This application inevitably implies revisiting the stance of scientific communication that is to be favoured depending on the context. One of the main caveats for the use of narratives and storytelling for PUS / PES is voiced by authors such as Katz (2013), Holsanova (2014), or Forceville (2017), who, as seen in previous sections, question the effectivity of similar genres to ‘convince’ viewers, as the latter posits: “Clearly what is jeopardized most is the logos part of the persuading, since the makers’ need to cede control to users’ choices as to how much of the material to access, and in what order, means that they can only to a very limited extent ‘build an argument’” (p. 7). A further issue is of an ethical nature. For instance, Dalhstrom (2013), questions whether “the underlying goal for using narrative is for persuasion or comprehension” (p. 13167); in this sense, it is worth revising, once again, the context of application of these measures and design specific learning outcomes that the ISDoc can help realise. Closely related to these processes is the development of digital literacies. Likely, the hypersemiotic framework can help provide instructors with additional tools to understand how users make sense (and describe) ISDocs or similar genres; as described, it emphasises the increased work that users must ‘decipher’ through interactive choices, and could thus be focused on either developing productive skills or to assess the effectiveness of interactivity from a quantitative point of view. The combination of the first two foci would benefit from research such as the one carried out by Molek-Kozakowska (2018, 2024), who focuses on how digital tools (such as AI) contribute to science communication to different audiences.

The third and fourth foci are also interrelated and imply developing different linguistic competences in ESP, EAP, or General English. Thus, the third focus would imply using ISDocs as examples of highly hybridised/-ing genres. This is based on Askehave and Nielsen (2005) 'goal-orientedness' of digital genres and Caballero's (2008) discursive implication for these genres, both of them pointing towards the nature of participation in these genres and how communicative purpose is established in the genre system of different communities. Additionally, the participation of different actants and authors (scientists, journalists) in ISDocs can be helpful in teaching specific instances of discourse hybridisation (Mäntynen and Shore, 2014), thus allowing to pinpoint specific registers and linguistic resources from different sources in single texts. Lastly, and benefiting from this discourse hybridity, ISDocs can be used with younger learners in General English instruction, since they can be exploited as multimodal texts with a variety of topics to develop different skills.

Science communication: PUS / PES

Closely related to the previous application, ISDocs can be assessed as tools for scientific communication. More specifically, and before carrying out this application, there should exist preliminary research that explains, using qualitative methodology, about how communicative strategies for scientific communication in ISDocs correspond to instances of PUS or PES stances. Dahlstrom's (2013) study on the use of narratives and storytelling provides solid foundations to understand how genres akin to ISDocs relate to either stance. In that sense, I believe that future research on the field should adopt a two-pronged approach. On the one hand, and in the same way as for the previous application, this thesis should be combined with the study of the socioemotional variables involved in successful outreach for science communication. Studies such as Berger and Milkman's (2012) or Hafner's (2023) can cater to this necessity, also taking the necessary strategies to tailor content to different social and geographical contexts into account (see Vasquez-Guevara, 2019, 2023) and caveats of science communication such as misinformation (see, e.g., Swire-Thompson and Lazer, 2020). On the other hand, this field should be complemented by current research in specific science areas

about the participation of stakeholders, channels, and strategies of communication to understand how either PUS or PES stances better suit different activity systems (see Brownson et al., 2018, for Public Health Science; Cooper, 2011, for climate change; Hohaus, 2020, for crisis societies).

Rhetorical communities and metadiscourse

Although Chapter 4 provided a description of a rhetorical community of actants in the ISDoc genre, future research should identify the participation of these actants through different approaches to text analysis. In Chapter 3, I suggested that CMDA (Computer Mediated Discourse Analysis; Herring, 2004, Herring and Trester, 2013) could be a suitable approach to analyse discourse and genre participation in digital, multimodal texts. Another approach to understand the positioning and identity of creators and audiences in the ISDoc genre would be through Hyland's metadiscourse theory (2015, 2017). For instance, the concepts of 'proximity' or 'positioning' could help determine the mental representation that the different creators in the ISDoc genre (journalists, scientists, etc.) enact in different texts. For users, and specially in ISDocs which allow specific user-user interaction and freer manipulation of contents, this approach could be combined with ethnographic methodologies to assess their sense of authorship over the platform's contents. Overall, I believe that Adami's (2013) ISS theory can support both approaches: by considering the interpersonal function of ISS, future research can benefit from the analysis of interactivity as another facet to consider.

Expansion of the hypersemiotic framework

Finally, future research could aim at developing the hypersemiotic framework. I believe there are two main possibilities for expansion: one theoretical, the other practical. The theoretical one involves one of this thesis' limitations, the determination of what counts as a semiotic mode or embedded genre. Scholars in the field of RGS could provide additional views to understand how different arrangements of materialities come to be perceived in digital, multimodal ensembles; and, more importantly, how users / audiences / interactors make sense of them as more or less independent modes or as texts with a specific social action.

In this line, the practical expansion would involve testing the hypersemiotic framework for other digital genres. Quite possibly, what new research should aim at is to provide new approaches to understanding the ‘triple hermeneutic’ of navigation in digital genres. In that sense, and through qualitative and quantitative research, RGS could benefit from new methods in understanding how the process of genre uptake is applied by audiences with different levels of expertise in digital literacy, subject matter knowledge, or other variables.

6.4. CONCLUSIONES

El trabajo que sustenta esta tesis se propuso investigar el género del Documental de Ciencia Interactivo, el DocCI (o ISDoc, por sus siglas en inglés) bajo la óptica de los Estudios Retóricos de Género. ERG (o RGS, por sus siglas en inglés). Siguiendo la afirmación de Miller (2016, p. 16) de que, para comprender el ‘cambio e innovación de los géneros, necesitamos todas las herramientas analíticas que podamos encontrar’, tanto la definición de la acción social, la exigencia y el kairos, por un lado, como el desarrollo del marco hipersemiótico, por otro, implican que el enfoque analítico de los RGS adoptado debe complementarse con teorías, enfoques y metodologías específicas de otros campos. Como se explica en la Introducción y se desarrolla en el Capítulo 1 y el Capítulo 2, esta tesis incorpora herramientas analíticas desde los campos de la producción de documentales y de la comunicación científica en línea. En las secciones siguientes, sugiero que los casos y ejemplos examinados aquí pueden ofrecer perspectivas sobre estas áreas de estudio en función de cómo el género DocCI ejemplifica e incluso pone en cuestión.

6.4.1. Comentarios finales sobre producción de documentales

Esta tesis ha establecido que el género ISDoc, como una forma transmediada del género documental matriz, se articula alrededor de una acción social también transmediada, encarnada en el llamado Contrato Documental (Skartveit, 2007). Esta transmediación influye en cómo deben aplicarse las cláusulas del Contrato en el género DocCI.

En cuanto a la cláusula de ‘Verdad’, los hallazgos mostraron que existe una correlación entre cómo los usuarios acceden a los textos DocCIs con las posibilidades hipersemióticas y el ampliamente debatido tema de cómo las expectativas configuran el género documental. Según señala Nichols (2001), “la audiencia se involucra con el documental con un ‘conjunto de expectativas sobre la autenticidad y veracidad del trabajo’” (p. 36); de hecho, una de las conclusiones de esta tesis es que los esquemas juegan un papel importante en cómo los usuarios se relacionan con los DocCIs, tanto en la asunción de su factualidad como en la interacción necesaria que se requiere de ellos. Los estudios de caso muestran que, debido a las posibilidades hipermodales del paradigma digital, la factualidad se construyó a través de una combinación de modos semióticos que, en conjunto, reforzaron la naturaleza evidencial del ISDoc. Pero quizás, lo más interesante es que la segunda suposición plantea un desafío a cómo los realizadores de documentales abordan la primera cláusula del Contrato Documental.

Como se vio en el Capítulo 5, argumenté que, en los ISDocs, la provisión de información factual (a través de modos semióticos) estaba intrínsecamente ligada a la acción en la plataforma y su contenido. La interacción no sólo permite a los usuarios alcanzar diferentes niveles de profundidad informativa de manera escalonada, sino que también se percibe o asume que es una condición previa necesaria para que el género exista. El desafío aquí tiene que ver con la ética de construir la verdad a través de la asunción de interactividad. Referenciaré tres enfoques que abordan problemáticas similares. Primero, en el Capítulo 1, y citando a Corner (2018, p. 65), los espectadores ‘son atraídos’ hacia el documental por una ‘compensación emocional’ que él llama el ‘tirón estético-afectivo’. Creo que esta compensación emocional se basa precisamente en el aspecto prometedor de la interactividad, la expectativa estética de que los usuarios van a tener el control de la narrativa. En segundo lugar, y en relación con esto, discutí que los estudios de caso mostraban un desequilibrio en términos de los niveles de interactividad real comparados con la interactividad percibida (Alkarimeh, 2019): siguiendo el análisis de ISS y el tipo de acciones y manipulación de lexías que permitían, se determinó que la estética de la interactividad superaba el rango de acciones permitidas a los

usuarios. En tercer lugar, y también derivado de los estudios de caso, analicé cómo los ISDocs mostraban similitudes principalmente con la clasificación de Gaudenzi (2013) de modos de documental ‘semi-abiertos’, en los cuales se otorgaba a los usuarios un control limitado sobre la plataforma. Creo que estas expectativas de agencia y autoría, y cómo algunos textos las reducen en la práctica, son el desafío para la cláusula de ‘Verdad’ del Contrato Documental. En cierto modo, las audiencias pueden sentirse ‘engañadas’ de la misma manera que con los ‘mockumentaries’. En este caso, el potencial engaño opera de manera encubierta: primero, por la promesa de agencia que la interactividad ofrece al usuario y su posterior reducción, en un proceso que Cortés-Selva y Pérez-Escolar (2016) califican como “‘clicktivismo’, que significa reducir el activismo a un simple clic, y no representa un verdadero compromiso con la causa” (p. 583); y en segundo lugar, por cómo, en el conjunto interactivo de los formatos narrativos, la factualidad de la información podría asumirse más fácilmente como verdadera que en otros argumentos lógico-científicos (Green & Brock, 2000).

La cláusula de ‘Actuar’, para el género ISDoc, se contextualiza en el kairos de la cultura participativa y la capacidad digital de la interacción. Para la primera, el análisis de la comunidad retórica del Laboratorio de Documentales Abierto del Instituto de Tecnología de Massachusetts (MITODL) sirvió para demostrar que, inherentemente, diferentes actantes participan en la configuración del género. Para la segunda, el ISDoc ejemplifica cómo los géneros digitales adoptan rápidamente los avances tecnológicos para crear nuevas formas de comunicación. Al igual que en la primera cláusula, creo que el principal desafío que plantean los DocCIs para la realización documental es cómo se explotan estas capacidades interactivas y hasta qué punto los usuarios realmente actúan en los DocCIs para la realización documental. Elijo particularmente tres metáforas que ilustran este problema: ‘brócoli cubierto de chocolate’ (Koenitz, 2018), ‘pintalabios’ (Pérez-Llantada, 2013), y el ‘síndrome de las cosas brillantes’ (Posetti, 2018). Todos ellos evidencian una trayectoria continua de los géneros digitales para incluir estas capacidades tecnológicas, más con el propósito de atraer afectivamente a las audiencias (cayendo así en la trampa del ‘determinismo tecnológico’, Vázquez-

Herrero, 2021) que para proporcionar formas efectivas de participación del usuario. En última instancia, esta evolución hacia formas de entretenimiento factual popular basadas en el mencionado tirón estético (lo que Corner denomina como el ‘contexto postdocumental’, 2002) contribuye a la inestabilidad del género (Schryer, 1993).

6.4.2 Comentarios finales sobre comunicación científica

El DocCI ocupa un lugar dentro de los otros géneros de divulgación científica que han pasado por un proceso de transmediación hacia Internet. Como se examina en esta tesis, esto tiene varias implicaciones relacionadas con la naturaleza de los contenidos científicos, con cómo la interactividad ha provocado un cambio en la relación de las audiencias con el texto y cómo los creadores de diferentes campos contribuyen discursivamente a la configuración del género. Identifiqué dos desafíos que el ISDoc plantea para los géneros de divulgación científica: primero, en relación con cuestiones de posicionamiento, y segundo, con respecto a la transmediación del discurso científico y su recepción por audiencias no expertas.

El primer problema relacionado con el posicionamiento tiene que ver con cómo el DocCI se posiciona como un género de Ciencia Abierta. El Capítulo 2 examina cómo la acción social del ISDoc se ajusta, casi unívocamente, a la definición de Ciencia Abierta de Vicente-Sáez y Martínez-Fuentes (2018): la cláusula de ‘Verdad’ se relaciona con el ‘conocimiento transparente y accesible’, y la de ‘Actuar’ con el ‘compartido y desarrollado a través de redes colaborativas’. Retóricamente, el DocCI es, en efecto, un género de Ciencia Abierta; pero discursivamente, la segunda parte es problemática: ¿cómo de ‘colaborativo’ es realmente el género DocCI?. Una vez más, este debate se relaciona con el grado de agencia permitido a los usuarios, pero, tal y como muestran los DocCIs analizados, esta cuestión puede estar opuesta a la efectividad de la comunicación científica. El segundo problema está más relacionado con el concepto de ‘posicionamiento’ desarrollado por Hyland (2015) y la comunidad retórica del DocCI. Aunque los científicos contribuyen significativamente en la realización del género, ¿cómo se construye su ‘yo discursivo’ (Ivanic, 1998) a través del texto? Como establece Tardy (2023), “los géneros también ofrecen a los escritores ciertos roles e identidades que asumir,

mientras restringen otros” (p. 12). ¿Están estos roles restringidos en el DocCI? Como se ve en los estudios de caso, *InfoAmazonia* presenta instancias de investigación llevadas a cabo mediante el modo narrativo ‘Explicativo’; en *Behind the Dirty Gold* y, en menor medida, *The Last Generation*, las voces expertas presentadas en momentos muy específicos de la narración parecían estar subordinadas a la estructura narrativa. La variabilidad del género deja este tema abierto, pero sugiero que, al construir estos ‘yoes discursivos’ de manera más explícita, tal vez el esfuerzo científico/académico del género quedaría reforzado y, por tanto, se estabilizaría.

En cuanto a los contenidos científicos del género, considero que existen tres desafíos principales. El primero tiene que ver con el cambio en las prácticas de realización documental descrito por Rabiger (2005): “[estas prácticas] han intentado dotar a sus productos de este sentido de sobriedad visible en la presencia de ‘tropos’ o ‘estilos’ que ‘pre-planifican la relación entre palabras e imágenes’” (p. 369). En los estudios de caso, este cambio en los tropos es especialmente visible a través de cómo los modos narrativos de Van Dijck (2006) necesitan reinterpretarse para el género DocCI. Además, aún es difícil clasificar la gran variedad de funciones que desempeñan los modos semióticos en cuatro modos narrativos, y estos podrían reinterpretarse aún más para atender la variedad de participantes en las comunidades retóricas de los DocCIs y los procesos de hibridación que afectan al género.

El segundo y tercer problema están interconectados. Como argumenté en la sección 6.4.1, la comunicación de estos contenidos científicos debe considerar el intrínseco poder persuasivo de la estructura sobre la cual están contruidos (Dahlstrom, 2013; Green y Brock, 2000). El desafío para los creadores de DocCIs, entonces, resuena en el cumplimiento de la cláusula de ‘Verdad’: ¿cómo pueden los documentales y los ISDocs desarrollar y hacer consciente sobre esta persuasión inherente? Por otro lado, esta persuasión puede estar limitada en que se dirige hacia la narrativa completa (la historia), y no hacia los contenidos científicos en sí, redirigiendo la atención de las audiencias. Esto refleja las palabras de Forceville (2017) sobre el género: la interactividad y la narrativa “reducen proporcionalmente

el poder del creador para argumentar y aumentan considerablemente el riesgo de que el usuario deje de comprometerse prematuramente con el documental o ni siquiera comience a hacerlo” (p. 8). Por lo tanto, los DocCIs deben abordar cuidadosamente el equilibrio entre la veracidad consciente de sí misma, la persuasión y el compromiso del usuario. Es especialmente a través de esta última preocupación que surge un problema final: el proceso hipersemiótico de navegación de estas narrativas interactivas está directamente relacionado con cómo los usuarios se involucran con el documental. El concepto más usado en la literatura sobre modos semióticos transmediados es la *incertidumbre* (Gustafson y Rice, 2020; Grainger, Mao, y Buytaert, 2016; Roth, 2013); por lo tanto, encuentro que es una metáfora útil que encapsula (como refleja el título de este trabajo) uno de los mayores desafíos para los DocCIs: el lado cognitivo señalado por el marco hipersemiótico; y cómo se convierte en una característica de diseño de un género que oscila entre cuestiones epistémicas y científicas para la realización de su acción social.

6.4.3 Comentarios finales sobre herramientas analíticas en RGS

En esta tesis, la metodología para el análisis del género DocCI se ha basado en la tradición de los ERG y, más específicamente, se ha inspirado en estudios como el análisis del género blog de Miller y Shepherd (2004) y la investigación de Kelly (2014) sobre géneros paracientíficos. El enfoque de esta tesis para la caracterización del kairos y la exigencia social del género ha requerido, como sugiere Miller (2016), realizar una revisión de diferentes campos y enfoques. Primero, la evolución del género documental, su acción social y el contexto de recepción; segundo, la posición de los géneros para la comunicación (para)científica en línea; tercero, las características materiales del medio que han permitido la transmediación del género y la realización de su acción social. Este último punto ha requerido la integración necesaria de otros enfoques lingüísticos. Destaco los trabajos de Elleström, Bateman y Adami, y cómo contribuyen, desde diferentes perspectivas, a la comprensión de la evolución de los géneros en el paradigma digital: respectivamente, para explicar los procesos de transformación mediática, estructurar la forma en que los géneros explotan las materialidades disponibles y

permiten las interpretaciones contextuales de los usuarios, y la correlación de la interactividad con la pragmática y las (meta)funciones que puede desempeñar.

En esta tesis, estos y otros enfoques teóricos han cristalizado en el desarrollo del marco hipersemiótico. Su diseño ha tomado en cuenta la adopción del género, la alfabetización digital y el potencial de repetición, revisión y re-instanciación de los géneros; su objetivo ha sido desarrollar una visión estructurada (partiendo de las materialidades de los modos semióticos, explorando la interactividad y el diseño ‘narrativo’ de los textos) que explicara cómo la acción social del DocCI se llevaba a cabo a través de este discurso interactivo. En la medida en que la hipersemiosis intenta contribuir a la comprensión del género objetivo de esta tesis y otros géneros en línea, considero que destaca una condición necesaria para que los ERG avancen y se adapten a la inestabilidad de los géneros digitales. Extraigo el concepto de ‘interoperabilidad’ de Koenitz (2014) para etiquetar esta necesidad. La investigación de Miller (entre muchas otras) es fundamental para este y cualquier otro estudio bajo la lente de los ERG para caracterizar el kairos y la exigencia social. No obstante, necesitamos que los estudios de ERG sean interoperables y sostenibles, especialmente en los marcos que utilizamos para describir este discurso hibridado, hipermodal, hipertextual e interactivo que caracteriza a los géneros digitales. El marco hipersemiótico es solo una instancia de cómo estas necesidades pueden abordarse; con suerte, y como sugiero en la sección 6.4.5, puede ser útil para otros investigadores y desarrollarse aún más para adaptarse a otras exigencias y estructuras. Si logramos establecer los tipos de enfoques que se pueden integrar en diferentes herramientas analíticas y hacerlas interoperables, entonces el RGS podrá caracterizar mejor los géneros y ponerse al día con la rápida evolución de los géneros en línea.

6.4.4. Limitaciones del estudio

Si bien esta tesis ha logrado proponer un marco analítico de hipersemiosis que pudiera abordar el análisis de la acción social, la exigencia y el kairos del género objetivo, ha resultado limitada al examinar dos fenómenos principales que son constitutivos del género: cómo las comunidades retóricas se conforman a través de acciones discursivas en los textos DocCI, y qué enfoque de comunicación científica

hacia audiencias no expertas se prioriza, ya sea la Comprensión Pública de la Ciencia (PUS) o la Participación Pública en la Ciencia (PES).

Como se exploró en el Capítulo 1, en el contexto de la ‘cultura participativa’ (Jenkins, 2006) que caracteriza la transmediación de documentales en el paradigma de la Web 2.0, el concepto de *comunidades retóricas* (Miller, 1994) es útil para determinar las relaciones ‘virtuales’ establecidas en géneros digitales como el ISDoc. Siguiendo su división en comunidades retóricas taxonómicas y relacionales, el Capítulo 4 exploró la configuración de una comunidad ISDoc específica, el MITODL, desde una perspectiva ‘social’: a través de la definición de los términos clave y las bases del Laboratorio, he analizado las relaciones que se establecían entre los actantes, el papel que desempeñaban dentro de la comunidad y cómo estas relaciones y roles se materializaban en el discurso de la sección ‘Acerca de’ del MITODL. No obstante, lo que quizás hubiera sido de mayor interés habría sido la exploración de comunidades retóricas que podrían haberse extraído de los estudios de caso. Varios factores condicionaron a esta tesis. En primer lugar, la elección de los DocCIs podría haber jugado un papel importante en esto. Como se vio en el Capítulo 5, ningún DocCI presentaba un lugar, sitio o lexía específicos en los que la comunicación ‘de arriba hacia abajo’ (es decir, de los periodistas hacia las audiencias) cesara y se fomentara la interacción usuario-usuario. En otras palabras, no se han podido analizar instancias textuales de interacción del usuario para comprender su posicionamiento dentro del texto DocCI (y cómo esto podría informar el análisis del género). En segundo lugar, y derivado de este hecho, el análisis de los ISS, especialmente en su metafunción interpersonal, ha resultado insuficiente para superar esta brecha. Si bien han proporcionado la información necesaria sobre cómo la interactividad en la página web redirigía la direccionalidad hacia diferentes actantes, no han logrado proporcionar un mapeo exacto de las relaciones establecidas dentro del texto. Miller y Kelly (2016) reconocen las dificultades en la caracterización de géneros para estas comunidades virtuales, y si bien el concepto de *comunidades* de uso favoreció un enfoque pragmático para comprender estas relaciones (similar a la teoría ISS), esta tesis ha resultado

insuficiente para proporcionar una definición precisa de las comunidades retóricas materializadas a través del discurso de los textos objetivo.

La segunda limitación del marco hipersemiótico tiene que ver con el análisis de cómo la comunicación científica se adapta o remedia para audiencias no expertas. El Capítulo 2 ofreció una visión general de cómo las nuevas formas de Ciencia 2.0 explotan las capacidades digitales y la consiguiente emergencia e innovación en estos géneros. Además, también se han revisado enfoques específicos de comunicación científica combinados con el periodismo, a saber, los modelos de Dahlstrom (2013), Dunwoody (2021) y Secko, Amend y Friday (2013) (centrados principalmente en las posturas PUS y PES). Los estudios de caso han podido identificar qué partes específicas del texto pertenecían a las intenciones de los autores en comunicar la ciencia y hacerlo de manera remediada. Un punto principal dentro del marco hipersemiótico ha sido establecer la forma en que las plataformas estructuraban estos contenidos. Como se vio especialmente en los casos de *The Last Generation* e *InfoAmazonia*, la estructura de interactividad e ISS se estructura de manera que la baja interacción con lexías paradigmáticas contenía la información científica más básica y remediada. El aumento de la interacción conducía a diferentes formas, acciones y efectos para los ISS, lo que a su vez implicaba acceder a información científica cada vez más profunda. A pesar de esto, esta tesis no ha podido proporcionar un análisis textual específico de si estas instancias de comunicación científica correspondían a posturas PUS o PES. A partir de los procesos analíticos explicados anteriormente, podría inferirse que, si bien originalmente se favorecía la PES y la ‘adopción’ de la ciencia en un género paracientífico, la facilidad de la interactividad permite proporcionar contenidos más profundos para audiencias más comprometidas o expertas, y así proporcionar un continuo hacia el PUS; sin embargo, la presente investigación no ha analizado el proceso y cómo este continuum ha evolucionado o funcionado en el estado actual del marco hipersemiótico.

6.3.5 Áreas para futura investigación

Basado en las limitaciones del presente estudio y la potencial aplicabilidad del género ISDoc a diferentes áreas, sugiero las siguientes cuatro áreas para futuras investigaciones, que pueden estudiarse bajo el lente de los ERG:

Aplicación pedagógica

La aplicación de los DocCIs en contextos de aprendizaje puede adaptarse a diferentes contextos y objetivos pedagógicos. Destacaría cuatro enfoques específicos para su implementación. El primero, y quizás fuera del alcance de los Estudios de Géneros Retóricos, es el uso de DocCIs con fines de comunicación científica, especialmente para la comprensión pública de la ciencia (PUS). Esta aplicación implica inevitablemente revisar la postura de la comunicación científica que se debe favorecer según el contexto. Una de las principales advertencias sobre el uso de narrativas y relatos para PUS/PES es señalada por autores como Katz (2013), Holsanova (2014) o Forceville (2017), quienes, como se vio en secciones anteriores, cuestionan la efectividad de géneros similares para ‘convencer’ a los espectadores. Como afirma Forceville: “Claramente, lo que más se pone en peligro es la parte del *logos* de la persuasión, ya que la necesidad de los creadores de ceder el control a las elecciones de los usuarios sobre cuánto material es accesible y en qué orden, significa que solo pueden en muy limitada medida ‘construir un argumento’” (p. 7). Otro problema es de naturaleza ética. Por ejemplo, Dahlstrom (2013) cuestiona si “el objetivo subyacente del uso de narrativas es la persuasión o la comprensión” (p. 13167); en este sentido, vale la pena revisar, una vez más, el contexto de aplicación de estas medidas y diseñar resultados de aprendizaje específicos que el DocCI pueda ayudar a realizar. Estrechamente relacionado con estos procesos está el desarrollo de las alfabetizaciones digitales. Probablemente, el marco hipersemiótico puede ayudar a los instructores a comprender cómo los usuarios interpretan (y describen) los DocCIs o géneros similares; como se describe en esta tesis, el marco enfatiza el trabajo adicional que los usuarios deben hacer para ‘descifrar’ a través de elecciones interactivas, y podría centrarse en desarrollar habilidades productivas o evaluar la efectividad de la interactividad desde un punto de vista cuantitativo. La combinación de los dos primeros enfoques se beneficiaría de investigaciones como la realizada por Molek-Kozakowska (2018, 2024), quien se

centra en cómo las herramientas digitales (como la IA) contribuyen a la comunicación científica con diferentes audiencias.

Los enfoques tercero y cuarto también están interrelacionados e implican desarrollar diferentes competencias lingüísticas en Inglés con fines específicos (ESP), Inglés académico (EAP) o Inglés general. Así, el tercer enfoque implicaría el uso de DocCIs como ejemplos de géneros altamente hibridados/hibridantes. Esto se basa en la ‘orientación a objetivos’ de los géneros digitales de Askehave y Nielsen (2005) y en la implicación discursiva de estos géneros señalada por Caballero (2008), ambos apuntando hacia la naturaleza de la participación en estos géneros y cómo se establece el propósito comunicativo en el sistema de géneros de diferentes comunidades. Además, la participación de diferentes actantes y autores (científicos, periodistas) en los DocCIs puede ser útil para enseñar instancias específicas de hibridación discursiva (Mäntynen y Shore, 2014), permitiendo así identificar registros y recursos lingüísticos específicos de diferentes fuentes en textos únicos. Por último, y aprovechando esta hibridez discursiva, los DocCIs pueden utilizarse con estudiantes más jóvenes en la enseñanza del Inglés general, ya que pueden explotarse como textos multimodales con una variedad de temas para desarrollar diferentes habilidades.

Comunicación científica: PUS / PES

Estrechamente relacionado con la aplicación anterior, los DocCIs pueden evaluarse como herramientas para la comunicación científica. Más específicamente, y antes de llevar a cabo esta aplicación, debe existir una investigación preliminar que explique, utilizando metodología cualitativa, cómo las estrategias comunicativas para la comunicación científica en los DocCIs corresponden a instancias de posturas PUS o PES. El estudio de Dahlstrom (2013) sobre el uso de narrativas proporciona bases sólidas para comprender cómo los géneros afines a los DocCIs se relacionan con cualquiera de las posturas. En ese sentido, considero que la investigación futura en el campo debería adoptar un enfoque de doble vertiente. Por un lado, y de la misma manera que para la aplicación anterior, esta tesis debería combinarse con el estudio de las variables socioemocionales involucradas en la divulgación exitosa de la comunicación científica. Estudios como los de Berger y

Milkman (2012) o Hafner (2023) pueden atender esta necesidad, considerando también las estrategias necesarias para adaptar el contenido a diferentes contextos sociales y geográficos (ver Vasquez-Guevara, 2019, 2023) y advertencias sobre la comunicación científica como la desinformación (ver, por ejemplo, Swire-Thompson y Lazer, 2020). Por otro lado, este campo debería complementarse con investigaciones actuales en áreas científicas específicas sobre la participación de partes interesadas, canales y estrategias de comunicación para entender cómo las posturas PUS o PES se adaptan mejor a diferentes sistemas de actividad (ver Brownson et al., 2018, para la Ciencia de la Salud Pública; Cooper, 2011, para el cambio climático; Hohaus, 2020, para sociedades en crisis).

Comunidades retóricas y metadiscurso

Aunque el Capítulo 4 proporciona una descripción de una comunidad retórica de actantes en el género DocCI, futuras investigaciones deberían identificar la participación de estos actantes a través de diferentes enfoques de análisis de texto. En el Capítulo 3, sugerí que el Análisis del Discurso Mediado por Computadora (CMDA, por sus siglas en inglés; Herring, 2004, Herring y Trester, 2013) podría ser un enfoque adecuado para analizar la participación discursiva y de género en textos digitales y multimodales. Otro enfoque para comprender la posición e identidad de los creadores y audiencias en el género DocCI sería a través de la teoría del metadiscurso de Hyland (2015, 2017). Por ejemplo, los conceptos de ‘proximidad’ o ‘posicionamiento’ podrían ayudar a determinar la representación mental que los diferentes creadores en el género DocCI (periodistas, científicos, etc.) establecen en diferentes textos. Para los usuarios, y especialmente en los DocCIs que permiten una interacción específica usuario-usuario y una manipulación más libre de los contenidos, este enfoque podría combinarse con metodologías etnográficas para evaluar su sentido de autoría sobre los contenidos de la plataforma. En general, creo que la teoría ISS de Adami (2013) puede apoyar ambos enfoques: al considerar la función interpersonal del ISS, futuras investigaciones pueden beneficiarse del análisis de la interactividad como otra faceta a considerar.

Expansión del marco hipersemiótico

Finalmente, la investigación futura podría apuntar al desarrollo del marco hipersemiótico. Creo que existen dos posibilidades principales para la expansión: una teórica y otra práctica. La teórica implica una de las limitaciones de esta tesis, la determinación de qué cuenta como un modo semiótico o género incrustado. Los estudiosos en el campo de los ERG podrían proporcionar perspectivas adicionales para comprender cómo diferentes conjuntos de materialidades llegan a percibirse en conjuntos digitales y multimodales; y, más importante, cómo los usuarios/audiencias/‘interactores’ los interpretan como modos más o menos independientes o como textos con una acción social específica. En esta línea, la expansión práctica implicaría probar el marco hipersemiótico en otros géneros digitales. Es muy posible que la nueva investigación deba concentrarse en proporcionar nuevos enfoques para comprender la ‘triple hermenéutica’ de la navegación en géneros digitales. En ese sentido, y a través de investigaciones cualitativas y cuantitativas, los ERG podrían beneficiarse de nuevos métodos para entender cómo el proceso de adopción de género se aplica por audiencias con diferentes niveles de alfabetización digital, conocimiento del tema o de otras variables.

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APPENDICES

APPENDIX 1: FACT SHEETS FOR ANALYSED ISDOCS

1.- *The Last Generation*

Project's name	The Last Generation
Website	https://docubase.mit.edu/project/the-last-generation/
Producer	Amy Gaines, Beth Murphy, Charles M. Sennott, Katie Worth, Michelle Mizner, Raney Aronson-Rath
Authorship	Katie Worth, Michelle Mizner
Synopsis	<p>The Marshall Islands, a low-lying island nation in the middle of the Pacific Ocean, is home to fifty thousand people. The seas are rising around the islands, and floods, once a rare occurrence, have become common. About half of the Marshall Islands' residents are children under the age of 18. With record increases in global temperatures, the country is likely to become uninhabitable in their lifetimes.</p> <p>The Last Generation is an interactive web documentary that tells the story of a country in peril — told by 9-year-old Izerman Yamaguchi-Kotton, 14-year-old Julia Rijino, and 12-year-old Wilmer Joel, who all live on the Marshall Islands. This immersive storytelling piece captures the hopes, fears, and resilience of these three children and the whole of the Marshall Islands.</p> <p>Michelle Mizner and Katie Worth, of FRONTLINE, reported for more than a year on this project through a fellowship with The GroundTruth Project. The filmmaker and reporter sought out the intimate stories of children growing up in a nation grappling with the effects of a warming world — the rising seas, the major storms, the floods and droughts.</p>
Topics	Climate Change, Community Portrait, Conservation, Environmentalism, Global Warming
Platform	URL: http://apps.frontline.org/the-last-generation/

2.- *InfoAmazonia*

Project's name	InfoAmazonia
Website	https://docubase.mit.edu/project/infoamazonia/
Producer	International Center for Journalists, Internews Earth Journalism Network
Authorship	Gustavo Faleiros
Synopsis	<i>InfoAmazonia</i> is a web platform that brings news and information about the Amazon forest and the nine countries it spans. The resources available on the website include maps and datasets that are ready to download and use, and a “special projects” section which includes miscellaneous programs such as a water safety network or a flood alert program. In addition, the website has a citizen participation section for crowdsourcing stories and news. With these diverse resources, <i>InfoAmazonia</i> aims to educate people about one of the most biodiverse areas of the world and the environmental challenges it faces.
Topics	<u>Environmentalism, Health and Wellness, Indigenous Peoples And Cultures</u>
Platform	Website.

3.- *Behind the Dirty Gold*

Project's name	Behind the Dirty Gold (Las rutas del oro)
Website	https://docubase.mit.edu/project/las-rutas-del-oro/
Producer	Sociedad Peruana de Derecho Ambiental
Authorship	Audrey Cordova, Jérémy Joly, Jimmy Carrillo
Synopsis	<p>Through “Las rutas del oro” project we wanted to expose to a large audience the problem of illegal gold mining in five countries of the Amazon (Peru, Bolivia, Brazil, Colombia and Ecuador). We wanted to present this problem through a trip and a journalistic investigation in order that citizens felt part of this story and understand better the complexity of that issue.</p> <p><i>“Las rutas del oro” (English title: “Behind the Dirty Gold”)</i> is an interactive web-documentary developed by the Peruvian Society for Environmental Law. The documentary explores the illegal trade of Amazonian gold. Through testimonies of illegal miners, researchers, and authorities, the documentary shows how illegal gold trade is carried out in one of the most biodiverse areas of the world, and why efforts to end illegal gold trade need to be amplified.</p>
Topics	Environmentalism, Gold Trafficking, Human Rights, Journalism, Latin America, Oral History, Politics, Privacy and Surveillance
Platform	Website.