



Hidalgo Urbaneja, María Isabel (2020) *Towards a definition of digital narratives in art museums*. PhD thesis.

<http://theses.gla.ac.uk/78980/>

Copyright and moral rights for this work are retained by the author

A copy can be downloaded for personal non-commercial research or study, without prior permission or charge

This work cannot be reproduced or quoted extensively from without first obtaining permission in writing from the author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

Enlighten: Theses

<https://theses.gla.ac.uk/>
research-enlighten@glasgow.ac.uk

Towards a Definition of Digital Narratives in Art Museums

María Isabel Hidalgo Urbaneja

BA in Fine Arts

MA in Publishing, Journalism, and Cultural Management

Submitted in fulfilment of the requirements for the
Degree of Doctor of Philosophy in Information Studies

School of Humanities

College of Arts

University of Glasgow

January 2020

© María Isabel Hidalgo Urbaneja 2020

Abstract

This thesis defines art museums' online resources as narratives in response to the following question: How can online resources, such as online exhibitions, online publications, and similar resources, be accurately and systematically defined? The aim of this definition is to provide a detailed, clear, and critical understanding of certain types of online resources, namely online exhibitions and online publications, that share attributes and functions. The two types of online resources contain and display exhibitions and artworks information, use similar interfaces and media, can serve similar audiences, and narrate the stories of the artworks. Based on the narrative character of both types, the definition comprehensively examines the spectrum of attributes online resources have and the implications of such attributes. Thus, the definition not only indicates what are online resources and their characteristics but also explains why online resources are the way they are and have certain characteristics, and how they function as narratives. These attributes are authorship, readership, temporality, spatiality, and mediality. In order to construct the definition, a systematic review of narratology and museum studies literature on narratives was pursued. The review of the literature was key to develop a comprehensive analysis of the phenomenon. Moreover, the methodology used in this thesis revised the traditional usage of narratology in museum studies research integrating empirical evidence. In this way, the narratological analysis moves away from the narrative text itself and also considers the production and consumption mechanisms of the narrative. The thesis employs six art museums' online resources from Spain, the United States, and the United Kingdom as sources for the research. Data from seven museum professionals involved in the creation of those resources was collected with interviews. In the case of the scholarly audience, twenty scholars performed think-aloud protocol sessions while visiting the online resources.

Contents

1	Introduction	1
2	Review of the Literature	6
2.1	Introduction	6
2.2	Beyond terminology. Similarities and differences between online exhibitions and online publications	7
2.3	Museums as narratives	14
2.3.1	Text, Intertextuality, Paratext	15
2.3.2	Narrative Structure	17
2.3.3	Historiography and narratives	19
2.3.4	Authorship	20
2.3.5	Narrative mediality	27
2.3.6	Spatiality and temporality	30
2.3.7	Readership	38
2.4	Conclusion	48
3	Research design and methods	50
3.1	Introduction	50
3.2	Choice of methods	51

3.2.1	Narratology and empirical research	51
3.2.2	Reflective practice	52
3.3	Surveying and selecting online resources for in-depth-study	54
3.4	Recruiting, interviewing, and collecting data from museums professionals	57
3.5	Using think-aloud protocol to research meaning-making and reading strategies	59
3.6	Transcribing recorded data	66
3.7	Analysing data: The coding process	66
4	A selection of online resources	70
4.1	Introduction	70
4.2	<i>82nd & Fifth</i> . The Metropolitan Museum of Art	71
4.3	<i>Online editions</i> . National Gallery of Art, Washington D.C.	74
4.4	<i>Scrollytelling</i> . Museo del Prado	76
4.5	<i>Building the Picture: Architecture in Italian Renaissance Painting</i> . The National Gallery, London	78
4.6	<i>Object:Photo</i> . Museum of Modern Art, MoMA	80
4.7	<i>Featured Artwork</i> . Museo Nacional Centro del Arte Reina Sofía	82
5	Research results: defining art museums' online resources as narratives	84
5.1	Introduction	84
5.2	Authorship	85
5.2.1	Authorship in online resources. Collaboration and contextual factors	85
5.2.2	Authorship perceived	97
5.3	Mediality, temporality, and spatiality	104
5.3.1	Representations of history	104

5.3.2	Temporality	106
5.3.3	Online resources as spatial types	113
5.3.4	The boundaries of the text. Embedded and non-embedded resources	116
5.3.5	Typologies and mediality. Online exhibitions and online publications	118
5.3.6	The visual and the verbal in online resources	121
5.3.7	The focus of spatial attention. Images and the interface	123
5.3.8	Linearity and nonlinearity	131
5.4	Readership	139
5.4.1	Readership and interactivity	139
5.4.2	Implied and real readerships. Art museums' online resources audience	141
5.4.3	The scholarly interpretive community. Identity, meaning-making, and reading strategies	148
5.5	Conclusion. A definition and its implications	156
6	Conclusion	161
6.1	Findings and contribution	161
6.2	Limitations and further research	167
6.3	What is next for online resources?	169
	Appendix A Survey of art museums' online resources	170
	Bibliography	176

List of Figures

3.1	Schema of the codes used to analyse the research data. Figure by the thesis author.	69
4.1	Detail of the home page. <i>82nd and Fifth</i> . 2013. https://82nd- and- fifth.metmuseum.org/ . . .	72
4.2	Screen capture of the <i>Online Editions</i> home page. <i>Online Editions</i> . 2014. National Gallery of Art. https://www.nga.gov/research/online-editions.html	75
4.3	Screen capture of the <i>Scrollytelling</i> launching feature integrated in the <i>Bosch. The 5th Centenary Exhibition</i> page. <i>Scrollytelling</i> . 2016. Museo Nacional del Prado. Visted on 10/10/2017. https://www.museodelprado.es/en/whats-on/exhibition/bosch-the-5th-centenary-exhibition/f049c260-888a-4ff1-8911-b320f587324a	77
4.4	Screen capture of the online exhibition catalogue opening page as it appears in the National Gallery website. <i>Building the Picture. Architecture in Italian Renaissance Painting</i> . 2014. National Gallery. https://www.nationalgallery.org.uk/paintings/research/exhibition-catalogues/building-the-picture	79
4.5	Screen capture of the photographs gallery at <i>Object: Photo. Object: Photo</i> . 2014. Museum of Modern Art. https://www.moma.org/interactives/objectphoto/	81
4.6	Page displaying <i>Featured Artwork</i> resources on the museum website. <i>Featured Artworks</i> . 2016. Museo Nacional Centro del Arte Reina Sofía. http://www.museoreinasofia.es/en/featured-artworks	83
5.1	Screen capture of an object page <i>Object: Photo. Object: Photo</i> . 2014. Museum of Modern Art. https://www.moma.org/interactives/objectphoto/	127
5.2	Detail of interactive captions. <i>82nd & Fifth</i> . 2013. Visited on 10/13/2017. https://82nd-and-fifth.metmuseum.org/	128

5.3	Detail of interactive captions. <i>Scrollytelling</i> . 2016. Museo Nacional del Prado. https://www.museodelprado.es/en/whats-on/exhibition/bosch-the-5th-centenary-exhibition/f049c260-888a-4ff1-8911-b320f587324a . . .	129
5.4	Screen capture of <i>Scrollytelling</i> . 2016. Museo Nacional del Prado. https://www.museodelprado.es/en/whats-on/exhibition/bosch-the-5th-centenary-exhibition/f049c260-888a-4ff1-8911-b320f587324a . . .	132
5.5	Home page screen capture. <i>82nd and Fifth</i> . 2013. https://82nd-and-fifth.metmuseum.org/ . . .	152
5.6	Screen capture of Interactive network graph. <i>Object: Photo. Object: Photo</i> . 2014. Museum of Modern Art. https://www.moma.org/interactives/objectphoto	154
5.7	Definition schema. Figure by the thesis author.	157
5.8	Comparing typologies schema. Figure by the thesis author.	159

Acknowledgements

I dedicate this thesis to my mother who passed away due to cancer while I was completing the corrections. She is a model of determination and courage. This thesis could not have been written without the support of her and my father.

I would also like to express my sincere gratitude to my supervisors, Ian Anderson, Maria Economou, and Nuria Rodríguez Ortega for the continuous support of my Ph.D. study and related research. Their insights and guidance were essential to the development of this investigation.

I would like to thank Elizabeth McLean, my internship supervisor at The Fruitmarket Gallery in Edinburgh, for allowing me to test my data collection methodology during the internship, and the staff at the Columbia University Media Center for Art History, the director Stefaan Van Liefferinge, Gabriel Rodriguez, digital curator, and Tim Trombley, Educational Technologist, for hosting me and advise my research in New York City. I would also like to thank the University of Glasgow Information Studies department for their continuous support during the course of my studies.

I extremely appreciate the time and interest of all museum professionals and art history academics who have participated in this research, their opinions and views are an invaluable element of this thesis.

This research has been sponsored by several awards and sources of funding including: University of Glasgow Early Career funding to pursue research at Columbia University. Doctoral Internship at The Fruitmarket Gallery in Edinburgh sponsored by the Scottish Graduate School for Arts and Humanities.

The Thomas and Margaret Roddan Trust award for students in Scottish Universities.
The University of Glasgow College of Arts Research Support award.

Chapter 1

Introduction

This thesis provides a definition of art museums' online resources as narratives. Online exhibitions, online publications, and analogue interactive resources support the narratives of museum collections and objects. As digital narratives, online resources present certain attributes. These attributes, authorship, readership, spatiality, and temporality, are characterised by digital media and museums qualities. The definition that the thesis offers does not merely establish what narrative attributes online resources have, but it critically examines the implications of such attributes. If digital narratives are defined the way they are and present specific characteristics, it is because of a series of factors determine and remodel production and consumption in online resources—authorship and readership, according to narrative terminology. The research findings illustrate the implications of digital narratives with the aim of providing a comprehensive and systematic understanding of the phenomenon.

The reasons why such a definition is necessary, come from the observations of the author of this thesis during her experience working with online scholarly publications in museums. She observed the similarities that exist between online resources that are labelled using different terminology, that, in appearance, respond to different typologies. Distinguishing online publications and online exhibitions is often impossible, yet, sometimes some differences between them are noticeable. Therefore, the research is focused on developing a conjunct definition, as well as interrogates whether different typologies ultimately exist. The experience of the author was key to the design of a definition that accounts for factors that shape online resources. She observed that why and how online resources are characterised as they may depend on digital media qualities as much as on each museum institutional framework and the audience interactions and perceptions with the resource. Additionally, the definition of online resources as narratives is centred on the responses and perceptions of a single segment of the museum audience, the scholarly audience. Once again, such focus responds directly to the

professional experience of the author. Working with scholarly publications led her to question what differentiates general audience online resources from scholarly ones and how scholarly resources can incorporate elements from general audience ones.

The thesis follows a classic structure. Chapter 2 focuses on exposing the state-of-the-art and review the literature. Section 2.2 of the chapter exposes the research problem, proving the author's perceptions and assumptions with literature about online exhibitions and online publications. It addresses inconsistencies and overlaps that emerge from comparing online exhibitions and online publications. These include the use of contradictory terminology, similar spatial and temporal schemes usage, the audiences they serve, and lastly, their narrative function. The section concludes that online resources should be studied together because of their narrative function and qualities, although research should also interrogate typologies and either confirm and overturn reviewed literature. Section 2.3 systematically reviews narratology, the theory of narratives, and how it applies to the study of museums as narrative texts in museum studies. This section is essential to the definition that the thesis provides. On the one hand, the review of narratology and narratological terms establishes the way in which specific terms are used to construct the definition. On the other hand, the review indicates the gaps that the research should fill when constructing the definition of online resources as narratives. Although there exists a substantial body of work relative to narratives in museum studies, no systematic and holistic analysis to the phenomenon has been pursued. Section 2.3 is divided into multiple subsections. The first three subsections set out the principles for conceiving museums as narratives. Subsection 2.3.1 highlights the idea that museums are texts. These texts may contain other texts, which hold an intertextual relation with the main text. Moreover, texts comprise a main text and paratexts, the elements that enable the interaction with the text. The following subsection, subsection 2.3.2 dissects the structure of narratives with the purpose of understanding what elements that form narratives are examined in the research. Lastly, subsection 2.3.3 sets clear the connection between narratives and history when it comes to narratives presented by museums.

The remaining subsections delve into the different attributes of narratives. Authorship, mediality, temporality, spatiality, and readership are under scrutiny in these subsections. The idea of author, and related terms that include narrator, voice, and focalisation, help to contextualise the idiosyncrasies of museum authorship. Museum authorship is collective and collaborative as much as authoritative and biased. Literature shows that there is a hope that digital media can transform authorship in the museum, enhancing some of these qualities and changing others. Research should provide evidence of to what extent authorship is transformed in online resources. Subsection 2.3.5 discusses how mediality is configured in museums. It pays attention to the notion of medium that applies to this research, discusses the dichotomy existing between the verbal and the visual, a matter of particular relevance to art museums

narratives, and invites to question whether a medium prevails or not in online resources—a question that extends to the interrogation of typologies as well. Subsection 2.3.6 addresses temporality and spatiality together because their close interrelation. It debates the temporal character of museums, exhibitions, and publications inviting to establish a clearer understanding of the temporality of online resources. Similarly, the subsection examines the spatial attributes of museums, in particular galleries, and finally asks for additional research in order to define spatiality in online resources. The last part of the subsection focuses on discussing the linear and nonlinear character of narratives and how it is shaped by the temporal and spatial qualities of museum galleries, publications, and digital media. In response to this review, it asks for an in depth analysis of the implications of linearity and nonlinearity in online resources. The last of the subsections, subsection 2.3.7, addresses readership, a term that extends to the notions of audience and user. The role of the reader in making the meaning of narratives is approached by reader-response theory, namely, by concepts such as interpretive community. A concept, the one of interpretive community, that offers a great potential to the study of scholars and their meaning-making and reading strategies.

Chapter 3 outlines the design of research and describes the methodology employed. The chapter begins with a section that argues for integrating empirical research with narratology. In this way, research converses with museum studies research approaches as well as with narratology. Narrative research, and one of its methods, structural analysis, was the method chosen because it applies narratology to the analysis of empirical data. Section 3.3 describes the procedure surveying art museums' online resources that led to the selection of the final six online resources used for in-depth research. The stage that follows the survey and selection of online resources is the collection of data. Sections 3.4 and 3.5 focus on the processes designing data collection protocols. The former describes the design of semi-structured interviews that reflect the views of museum professionals involved in the development of the six online resources studied. The latter explains the rationale behind the choice of think-aloud protocol as a data collection method that captures the interpretive and reading agency of scholars. Emphasis has been given to argument the suitability of the think-aloud protocol for the purposes of this thesis. The method has been used for studying readers' responses to digital and non-digital texts, as well as the user interaction with digital literature creations and museums' online resources. The last two sections of the chapter discuss the transcription process and the narrative coding used to analyse the data collected.

The research results are presented in two different chapters. Chapter 4 shows the findings of the survey that led to the selection of the six online resources. Chapter 5 provides the definition of online resources as narratives and its implications. The survey shows the most common attributes of online resources, the most popular typologies. The final six selected online resources from three countries, Spain, the United States, and the United Kingdom, are: *Online*

Editions (National Gallery of Art 2014), *Object:Photo* (Abbaspour et al. 2014), *82nd & Fifth* (Metropolitan Museum of Art 2013), *Bosch. A story in pictures* (Museo Nacional del Prado 2016), *Featured Artworks* (Museo Nacional Centro de Arte Reina Sofia 2016), and *Building the Picture: Architecture in Italian Renaissance Painting* (Lillie 2014). Each of them have unique features while being representative of the most common features in online resources.

The results that constitute the definitive definition of art museums' online resources as narratives are discussed in Chapter 5. The research results extend, but also confirm, clarify, and overturn, the literature reviewed in Chapter 2. The chapter has also been structured to follow the ordering of the subjects in Chapter 2. The first subsection on authorship focus on the analysis of collective authorship and collaboration dynamics. It addresses common authorial structures behind the development of online resources and shows that there exist different authorial hierarchies and direction models. The findings that this subsection presents reveal the factors that affect the authoring of online resources. These contextual and institutional factors encompass economic conditions and challenges, collaboration circumstances, temporal constraints, institutional barriers and opportunities. Technological capabilities shape online resources' narratives as much as institutional capacities and circumstances. The second subsection examines how authorship in online is perceived by the audience. The findings demonstrates that the museum comes across as an authoritative and non neutral institution in online resources. More effort could be put into making online resources more multivocal, open and transparent, according to research findings.

The following section expose the research results relative to time, space, and media in narratives. Subsections individually address different temporal and spatial aspects of online resources as narratives. The first one delves into representations of historical time and space in online resources. The second subsection addresses all facets of temporality in online resources as narrative forms, from their discursive temporal dimensions to the time that the audience brings into the visit and reading of the resources.

The analysis of spatiality concerns several interface models and the manipulation of space as a focus of attention. The nature of the digital medium conditions interfaces. Interfaces are variable and online resources can be two-dimensional and three-dimensional, have different extensions, easily accommodate multiple media overcoming the physical limitations of exhibitions and publications. The subsections compare different spatial models and outline the implications of each of them. Online resources can be two-dimensional and three-dimensional, embedded and non-embedded in the museum website, linear and nonlinear. Each model presents some advantages and disadvantages to both authors and readers and favour specific narrative qualities. The analysis of spatiality extends to the formatting of images of the artworks. The scale, size, format and degree of detail of the photographic reproduction tell

different things about the object. Two subsections are dedicated to the analysis of the mediality of narratives.

Art museums' online resources are characterised by their multimedia qualities. Subsections 5.2.5 and 5.2.6 discuss on the one hand, the prevalence of media in certain types of online resources, and on the other hand, the complex relationship between the verbal and the visual in these resources. One of the research findings is that there is a tendency for online resources to become even more visual than they are at the moment. Something that requires striking a better balance between images and text.

The last section of Chapter 5 is dedicated to the study of the scholarly audience. The narratology terms, *implied reader* and *real reader*, help to examine the research results relative to the expectations of museums in terms of audience and the actual responses of the scholarly audience to online resources. It challenges some of the literature assumptions on audiences. Subsection 5.3.3 employs another concept, the one of the *interpretive community* that when applied to the scholarly audience, provides an understanding of scholars as a community that shares specific codes, meaning-making, and reading strategies. All of them determined by their specialist knowledge background. Chapter 5 concludes with a section in which a diagram summarises the narrative attributes and their variables of art museums' online resources. The conclusion then delves into the implications of the identified attributes according to the research results analysed in the chapter.

Chapter 2

Review of the Literature

2.1 Introduction

Working with museums' online scholarly catalogues led the author of this thesis to pose the questions that guide this doctoral research. The fellowship she completed at the National Gallery of Art in Washington, D.C., gave her the opportunity to witness the conception of online catalogues, converse with colleagues about conceptual and production matters related to them, and ultimately reflect on the principles behind their creation. She compared the catalogues she worked with and other museums' online resources realising that while their scope was different, they shared similarities. A fundamental difference that in principle applies to these online catalogues is that they cater to scholarly audiences, yet their features are not substantially different from those of general-audience online resources. She found that when explaining to colleagues inside and outside the museum what online scholarly catalogues were, her interlocutors sometimes struggled to conceptualise the idea of online publication, to the extent of considering these catalogues online exhibitions, which in appearance are a different type of online resource. The boundaries that delimit existing types of online resources are blurred and changing. The aim of providing a definition of art museums' online resources arises from the comparison of the apparently different types of online resources and reflections about their nature. These realisations are not the only source for research. The author of the thesis was also aware that if online catalogues are formed in the way they are, it is because of new media affordances, museums' objectives, limitations, and opportunities, as much as audiences' needs and perceptions. The research problem should account for these factors that determine how and why online resources are defined.

Section 2.2 of this chapter formulates the research problem, proving the researcher's

perceptions and assumptions with literature about online exhibitions and online publications. It highlights the overlaps, contradictions, and debates that emerge from comparing online exhibitions and online publications. This section addresses contradictory terminology usage, the use of similar spatial and temporal models, the audiences they address, and their narrative function. It establishes that online exhibitions and online publications should be examined together instead of analysed as separate typologies. The narrative quality of online exhibitions and online publications sets the grounds for a definition that should provide more clarity and in-depth examination of online resources. Following the conclusion of section 2.2, the subsequent section of this literature review focuses extensively on narratology, the theory that studies narratives. The section examines how narratology applies to the study of museums. The examination of museums as narratives is a well established approach in museum studies that offers an in-depth and critical understanding of museums. The gaps research should fill in order to define online resources as narratives are established by the review of the literature.

2.2 Beyond terminology. Similarities and differences between online exhibitions and online publications

Online resources have been increasingly produced by museums as they expanded their web presence in the last decades. *Online resource* is a unifying and generic term that encompasses existing typologies of Web-based resources. Two discursive typologies, as well as material configurations, prevail to this day in art museums: the exhibition and the publication. In the representations museums have made of themselves online, the exhibition and publication models have been replicated and rethought. Some art museums' online resources are digital replicas of the exhibition and/or the publication. However, some online resources have erased connections and similarities with the exhibition and the publication models while proposing novel approaches and functionalities; and some online resources are hybrids that integrate certain features from exhibitions and/or publications. These two types of online resources can host the same range of content, including text, images, audio, and video. They use similar interfaces and serve the same audiences. Is it fair to consider them two different typologies?

A frequent theme in the study of digital media theory is the analysis of its genealogy. Every time a new medium develops, theorists enter a discussion around their technical precedents, novel or improved functionalities and characteristics. In short, no medium seems to be new in absolute terms. Innovation in new media go hand by hand with the desire for improvement of the precedent media rather than from a rupture with them. According to Bolter and Grusin "what is new about new media comes from the particular ways in which they refashion older media and the ways in which older media refashion themselves to answer the challenges of new

media.” (2000, 15) The concept of *remediation* (Bolter and Grusin 2000) helps situate online exhibitions and publications in the context of the digital transformation museums undergo. As similarities between both types become noticeable, the influence the exhibition and the publication types have in the constitution of online resources cannot be obviated.

Having worked with online scholarly publications in art museums, the author of this thesis has been led to reflect on the similarities that exist between online publications and online exhibitions and other interactive resources. Connections between types are noticeable not only in everyday practice but also in the literature. There is an overall lack of consensus on what characterises art museums’ online exhibitions and online publications. Sometimes museums assign a typology to a given online resource, for example *online exhibition* or *scholarly catalogue*. But often resources are labelled by institutions using different terminology, for example *interactive feature*, even though they resemble online exhibitions or publications. The definitions of typologies given in the literature reveal the inconsistencies and overlaps between the types. Discerning whether a resource is an online exhibition or a publication becomes a difficult enterprise. The following lines provide evidence to the above statements and make a case for a more effective manner to examine and define art museums’ online resources holistically.

The scrutiny of terminology used by museums and museum studies literature helps to reveal existing coincidences and contradictions between the two types. Terminology differentiates the two types, yet it is used inconsistently, in some cases revealing overlaps between online exhibitions and online publications. A review of museum studies texts and museum websites shows that the term *online exhibition* is used to refer to several types of online resources: the website or interactive feature that accompanies a physical exhibit (Smith Bautista 2013), a virtual reconstruction or reproduction of the museum galleries (Mateos-Rusillo and Gifreu-Castells 2017), an exhibition that exists exclusively online (McTavish 2006), and a multimedia and interactive resource about museum objects. Additional—and more descriptive—terms are also used to refer to online exhibitions. Some articles employ the term *microsite* or “exhibition subsite” (Smith Bautista 2013); others use “online interactives or projects” (Del Río 2013) or “online galleries” (McTavish 2006, 236). But this is not always necessarily the case. Sometimes authors employ terms in a questionable manner, revealing the disparate frameworks that define the typology. A recent study uses “virtual exhibition” to broadly refer to “online exhibition, online museum, virtual museum, digital museum, museum website, and e-museum” (Kim 2018). This ambiguous use of the term does not take into account early discussions on online exhibitions, which acknowledge a difference between the museum website and online exhibitions: “a website hosted by a Museum is not in and of itself an online exhibition” (Tinkler and Freedman 1998). Additional approaches to terminology raise further issues around the conception of online exhibitions. Gallery tours can be excluded

from definitions of the online exhibition. For instance, in her study, Liew (2006) does not consider three-dimensional views of galleries as online exhibitions. Marty (2008) instead groups “online tours of galleries/interactive exhibits” together. “Interactives/online exhibitions”¹ are, according to del Río, the two ways to denominate the same resource. Yet museum interactives might not be recognised as online exhibitions. In fact, a major museum lists on its website the same online resources under two different categories—under both *online interactives* and *online publications*²—suggesting that interactive resources can also be online publications. This leads to the next point: online exhibitions can be categorised as online publications and vice versa. Paradoxically, online publications are identified as online exhibitions in professional forums. This surfaces in the categories of awards given at Museums and the Web, a professional conference, in which a couple of online publications are included in the category of “online exhibition”³. To complicate the terminology discussion even further, some authors argue that the role of the online exhibition can be fulfilled by other resources because “online publications [...] could facilitate such experiences” (Lester 2006).

The online publication type is representative of a range of outputs, from digitised catalogues often downloaded as PDFs (Smith Bautista 2013, 214), catalogues in e-book formats (Albers 2017), rich-media catalogues that include exhibition catalogues, collection catalogues, and catalogues raissonés (Ballon and Westermann 2006), to general-audience-oriented online publications associated with both temporary exhibitions and permanent collection (Minneapolis Institute of Art n. d.). As with online exhibitions, generic terms are used to designate the various types of online publications. The terms *online catalogues*, *e-catalogues*, *online publications*, and *online editions* allude to either digitised catalogues, e-books, or rich-media web-based catalogues. While, in principle, digitised and e-book formatted catalogues are easily recognised as publications, the varied nature of web-based catalogues makes more precise terminology difficult to pin down. The increasing popularisation of rich-media web-based scholarly catalogues (Getty Foundation 2017) enriches the discussion on the nexus between the online publication and the online exhibition. Promoters and producers of online scholarly catalogues draw upon online “exhibition modules” (Honeysett 2011), as well as upon the collection database and printed books (Quigley and Neely 2011), to generate their new publications, revealing relevant connections between typologies. As online publications re-conceptualise the printed catalogue, become hypertextual, and more multimedia, similarities

¹Translated by the author from Spanish. Original text: “Interactivos / Exposiciones online”.

²The same online resources appear on the list of publications available on this site: <https://www.metmuseum.org/art/metpublications/online-publications> and on the home page of the museum when clicking firstly on “Art” and subsequently on “Online features” in the drop-down menu: <https://www.metmuseum.org/>

³The two following online publications: <https://mw2015.museumsandtheweb.com/bow/visualizing-19th-century-new-york-digital-publication/> and <https://mw2015.museumsandtheweb.com/bow/drawn-cut-layered-the-art-of-werner-pfeiffer-e-catalogue/> were on the list of nominees of the 2015 edition of the “Best of the Web” awards: <https://mw2015.museumsandtheweb.com/best-of-the-web-nominees/>

between the online exhibition and the online publication arise.

A physical exhibition in an art museum displays artistic objects within an exhibitionary space, usually a gallery. Temporary exhibitions are the most distinctive type of exhibitions, but art museums have also opted for a display of pieces from their permanent collections as a series of exhibitions. In these exhibitions, art museums arrange their collections in consonance with artistic periods, schools, artists, or themes. But this arrangement also changes over time, either when curators decide it, new acquisitions enter the collection, or artworks are restored or temporarily on loan to other institutions. This approximation to the concept of exhibition suggests that the notion of temporality delimits the exhibition conceptual framework. Print exhibition catalogues extend the “life” or temporal dimension of the exhibition, “providing a permanent record that outlives an exhibition” (Hughes 2010). In this way, the publication emerges as an element of stability and preservation in museums.

As museums embrace digital media, traditional conceptions around temporality are challenged. When the museum, an exhibition, or a publication becomes digital, would it “be achieving immortality” (Seijdel 2000)? Online exhibitions are frequently referred to as storing devices, which, like print publications, revert the temporality of exhibitions. In the words of net.art artist Olia Lialina (1998): “On-line galleries and exhibitions are nothing more than lists, collections of links. (...) list by list compilations bring us to an archive-like situation, to a story about keeping and retrieving information.” Online exhibitions would offer “a continuing life to the ideas presented in the brick-and-mortar galleries long after the exhibitions have closed” (Kalfatovic 2002); they complement and extend the physical visiting experience (Sayre 2000; Liew 2006). If, according to these authors, online exhibitions fulfil the function of the print publication, what then is the role of online publications? In principle, the stability of print publications would be preserved in their online counterparts. Online publications can be conceived as well as “sites of research and appear during and after the exhibitions to harvest and disseminate their significance” (Ballon and Westermann 2006). Although recent literature is concerned with the practicalities of making online publications as stable as books (Mann 2016; Albers 2017) and with preserving online exhibitions (Persons 2015), digital media is unstable and constantly evolving, as opposed to immortal. Certain types of scholarly publications related to permanent collections, such as catalogues raisonnés (Gabrielli 2015) and collection catalogues (Ballon and Westermann 2006), are taking advantage of the mutability of digital media to rethink their temporal condition. These types of publications are affected by changes in scholarship and revisions, requiring them to be re-edited. Online publications can accommodate the constant stream of changes without the cost of printing a new edition. They are permanently kept but mutating. The former temporal dimensions of exhibitions and publications have substantially changed during their digital transition to the point of erasing the differences between them.

The physical museum is a paradigmatic spatial model (Hillier and Tzortzi 2006). The architectural space, the way galleries are laid out, the elements of display—temporary walls, wall colour, vitrines, plinths, lightning, etc.—are all spatial elements everyone recognises as belonging to the museum exhibition. The publication is an equally archetypical spatial form. The codex book, its structure, and the two-dimensional presentation of content are unequivocally related to the idea of publication. When exhibitions and publications are remediated, their spatial models are rethought. A very popular model of online exhibition is the one that portrays the museum's galleries. Skeuomorphic design, 360-degree images, and videos of galleries seem to have had a broad acceptance among institutions that have sought to create immersive experiences and have received attention from museum studies authors. This replica is denominated "virtual gallery" (McTavish 2006), "virtual tours/visits" (Varisco and Cates 2005), "capturing the gallery" archetype (Mundy and Burton 2013), or "mirror model" (Mateos-Rusillo and Gifreu-Castells 2017). McTavish, however, points out that three-dimensional reproduction of the architectural space is at odds with the modernist aesthetic identified with art museums across their websites, print publications, and even their buildings and galleries (2006, 226). Perhaps, for this reason, another spatial model of online exhibitions coexists with the three-dimensional replica of the museum. This kind of online exhibition has the appearance of a website in which content is laid out in graphic, flat forms (Mundy and Burton 2013). Labelled also as the "hypermedia model" (Mateos-Rusillo and Gifreu-Castells 2017), it arranges images of the artworks, texts, and videos in a two-dimensional space. Paradoxically, this spatial model combines the static representation methods that replicate the use of images and text similar to catalogues and books (Kim 2018), to which dynamic elements such as motion and sound are added (McTavish 2006, 236). It is precisely this two-dimensional spatial model that online publications employ. Some digital publications clearly resemble a codex (Quigley et al. 2013), and others exist at the "intersection of a website and a traditional scholarly publication" (Goodyear 2016).

A widespread assumption is that certain online resources appear to be better suited to specific audiences than others. Some texts reinforce this idea. Online exhibitions are typically conceived to educate a general audience and are often deemed an "educational" type of online resource (Mateos-Rusillo and Gifreu-Castells 2017). Online exhibitions or exhibition websites are also deemed a "public relations incentive" the museum utilises to attract the audience (Honeysett 2011). The association that most people make between the use of digital technologies in museums and "edutainment" (Griffiths 2003, 375-7, quoted in Henning 2006, 303) has helped to solidify this idea. There is a "difficulty that many in the art world have accepting the intellectual value of sites designed for mass audiences and which are associated in the minds of many with a sphere of popularising communications and transient promotion" (Mundy and Burton 2013). This preconception has been detrimental to the use of online resources for scholarly purposes until recent years. The rise of digital art history and digital

humanities is contributing to changing this perception. The online publications art museums have created, many of those under the auspices of the Getty Foundation Online Scholarly Catalogue Initiative OSCI (Getty Foundation 2017), have reinforced the idea of the publication as a scholarly, audience-driven resource. The principal accounts on online publishing describe publications that serve specialised audiences, namely scholars and their research purposes (Honeysett 2011; Quigley et al. 2013; Yiu 2013; Getty Foundation 2017). Nevertheless, additional literature overrides these preconceptions. According to Varisco and Cates, “web-based educational resources”, including online exhibitions, serve “a broad visitor base that includes the public at large, teachers, and researchers” (2005). The manifold educational levels online resources can support range from primary- and secondary-school education to adult education and undergraduate and postgraduate university education, often simultaneously. For example, museums have sought to develop online educational interactives refusing to provide educational content that is “distilled and summarized in small, layered didactic chunks” (Knutson 2013, 149) and instead offering primary source material cater to university students and scholars; online exhibitions with the “scholarly authority” of a major institution in-gallery exhibition (Mundy and Burton 2013); and online publications in which there are layers of content, from general to specialised, from which the audience can choose (Getty Foundation 2017). Online exhibitions and online publications can be oriented to the same audiences; it seems incorrect to associate the typologies to the audiences they address.

Except for online exhibitions that feature digital art pieces, both online exhibitions and publications present digital surrogates of artworks, normally as images, but also as videos or three-dimensional models. Regardless of what model online exhibitions adhere to, all authors agree that online exhibitions include multimedia content, from images and video to written text and audio. Liew differentiates between full text, photographs, maps, video clips, bibliographic information, and photographs (2005). Comparable materials are listed by Varisco and Cates (2005), who mention images, explanatory texts, video or audio clips, and animations. Del Río’s article (2013) covers a list of educational resources in *online museums* of contemporary art in which multiple media make an appearance: “audio, [...], video, [...], articles, essays, reviews, bibliographic references”. Educational online resources stand out for their sophisticated use of rich media. They can be a model for the “less appealing” scholarly publications. It is thought that scholarly oriented online resources, namely publications, should “take advantage of the considerable expertise in image display and analysis developed by museum education and design departments” (Ballon and Westermann 2006, 46). Recent online publications present the traditional long-form essays surrounded by high-resolution, X-ray, and infrared photographs of artworks as well as by videos and audio (Yiu 2013), making it difficult to differentiate the two typologies on the basis of the media they utilise.

Like their physical counterparts, online exhibitions and publications are used by art

museums to present the stories of their artworks and collections to an audience. They are distinct from the main museum collection, often hosted in a separate site, use media in a more creative manner, and have a clearer scope. Museum studies texts have highlighted the narrative ordering that guides online exhibitions and compared them with collection databases. In the first page of his manual to create online exhibitions, Kalfatovic (2002) states that online exhibitions are narrative. In order to form an exhibition, museum objects should be carefully chosen “to illustrate a theme and tied together by a narrative” (Kalfatovic 2002, 1). An online exhibition “should do more than put collections online; it should reveal the underlying relationships that transform a random collection of objects into a meaningful exhibition” (Tinkler and Freedman 1998). Online exhibitions “offer a coherent view of some domain unlike collection management systems that focus on individual objects” (Besser 1997, 161). The novelty of online exhibitions resides in their ability to “present more vivid narratives and deeper contextual information” (Nickerson 2002). But narrativity, the quality of being narrative, is not exclusive to online exhibitions. Publications present similar characteristics. Online publications are also conceived as an alternative to online collections databases that “present a comprehensive collection with little information” (Yiu 2013). They extend the narratives of individual objects and provide an overarching narrative that unifies them. Online scholarly publications provide the audience with “narrative overviews and discussions” (Goodyear 2016), “structured narrative experience with opportunities for self-guided exploration” (Quigley and Neely 2011) thanks to a model that combines the best of the book-like linear narratives with the parsed structure of the hypertext and the database.

Underlying this discussion is the conflict between database and narrative. To understand the dynamics of this conflicted relationship, attention must be given to new media theory arguments. Briefly described a database is “commonly understood as a computerized record-keeping system” (Paul 2014, 127). Lev Manovich thinks database and narrative are “natural enemies” (2002, 228) because narrative implies an order, and a database can be consulted without a linear ordering. But databases are the data containers of any web page; their logic is also embedded in online resources. How, then, can an online resource be narrative if its skeleton is a database? Marie-Laure Ryan diverges from Manovich’s idea. She directly responds to Manovich’s argument by suggesting some conditions in which a database and narrative reconcile. To acquire narrativity, a database should be “modular” and have “individual parts [that] are themselves more or less autonomous stories”. Furthermore, the “database design and linking philosophy” should be “sufficiently transparent to enable readers to aim with precision at the elements of the story that they want to expand” (2011, 149). Therefore, if some online resources are more narrative than others, it is because they have been designed to support modular stories (e.g., different artworks’ narratives) and to make the elements of the story clear to the reader (e.g., through a home page, menus, and links). However, there are some authors who argue that the narrativity of a database is brought in by

the reader. The database "demands narrative's reappearance as soon as meaning and interpretation are required" (Hayles 2012, 176). In this way, a museum collection database is understood as "a framed collection of digital objects, through which users can build their own narratives" (Parry 2007, 80). Does this mean that any database can be narrative? The answer is yes. But in the context of this thesis, only online resources that have been designed to be intentionally narrative, such as exhibitions and publications, will be taken into account.

The various similarities between online exhibitions and publications this section discusses invite to question whether they actually constitute two different typologies and whether a false dichotomy has been built around them. In sum, the terminology that is used to refer to them is often inaccurate. Additionally, both exhibitions and publications use interfaces with spatial dimensions, feature the same temporal dimensions and media, serve similar audiences, and, lastly, share a narrative scope. In accordance with these overlaps and common features, the thesis proposes a conjunct definition of online resources that examines online exhibitions and online publications from a common ground. This definition understands that online exhibitions, online publications, and other resources alike are all narratives. In conceiving them as narratives, matters relative to spatial and temporal dimensions, mediality, and audience are also examined. In order to establish a definition of online resources as narratives, an extensive analysis of them from narrative theory is needed. The following section of this literature review focuses on narratology, the theoretical framework that studies narratives, and how museums are conceived as narratives, before constructing the definition of online resources.

2.3 Museums as narratives

Despite the widespread interest in narratives and storytelling in today's museum practice and research, there is a lack of systematisation in the study of narratives. If reviewed from the perspective of narratology—the theory that studies narratives— museums are not addressed holistically. Articles, books, and essays only focus on some elements of the narratives, for example authorship and space in exhibitions or digital environments. Perhaps because narratives are complex structures, holistic analyses are demanding and almost unattainable. This poses a real challenge for such a review of the phenomenon, which in this occasion will be tackled in the following manner: Classic narratology texts and introductory companions to the discipline—including encyclopaedias, dictionaries, readers, introductions—introduce key terms. These terms are explained and applied to literature on museums' narratives relative to "physical" museums and digital projects, and occasionally to literature on online resources. This implies the referencing and citing of texts dating back to the mid-twentieth century to interpret recent literature on narrative exhibitions and digital storytelling. This review method

is aimed to identify what elements characterise narratives, whether these are digital or not; to understand how museums, in general, and art museums, in particular, constitute narrative texts; and finally to determine what subjects require further research, in order to construct the definition of art museums' online resources as narratives.

2.3 Text, Intertextuality, Paratext

For a narrative to exist, there has to be text. To analyse museums as narratives, the museum should be conceived as a text. Therefore, the concept and nuances of the idea of text need to be defined. Almost every entry of the definition of “text” in the Oxford English Dictionary refers to the verbal quality of it and the fact that texts are made of words. But a draft addition from 1993 provides a less medium-specific definition in which a text is “(A unit of) connected discourse whose function is communicative and which forms the object of analysis and description” (OED 2018). This definition suits the multimedial quality of the museum and explains the communicative function of the text. The definition also indicates that a text is a “unit”, something contradictory with the reality of museums. Every museum is a “unit” but also a container of objects which are in themselves “units”. The museum presents multiple discourses: the discourse of the institution itself, the discourse of the exhibitions, and the discourse of each object on display. These discourses take a narrative form. In museums, narratives do not exist independently; they are interconnected. Narrative texts are embedded into other narrative texts. The narratological concept of intertextuality, coined by Julia Kristeva (1980), refers to this interconnection in the following way:

Intertextuality refers to the presence of a text A in a text B. A is the ‘intertext’ if one stresses the textual precursor, the ‘pretext’ absorbed by a later text. Or, one could call B the intertext if one lays emphasis on the text incorporating a previous text and thereby becoming intertextual. (Moraru 2005)

An art exhibition and its artworks are related intertextually. During its early history, the art museum left the work of art to speak for itself in the gallery, but the unintentional relation between the galleries and the artworks displayed in them, and between the artworks themselves, creates an intertextual connection. The artworks are “intertexts” which have been incorporated into a “pretext” which is the exhibition. Individual artistic objects tell a variety of stories that range from their subject to the imprint of their making, because “each material and method of manufacture has a history” (Cuno 2011, 34-35) or the stylistic qualities that situate them within a time period. However, artworks sometimes only yield meanings “if we are able to ‘read’ it, put it in some context that illuminates these cultural meanings” (Bal 1996, 148). Intertextuality

is a concept that helps to make sense of this web of narratives. It coexists with other concepts that provide additional insights on what makes up a text and its boundaries.

The paratext, a term defined by Barthes, refers to “verbal or other productions” whose function is “to make present, to ensure the text’s presence in the world, its ‘reception’ and consumption” (Genette 1987, 1). It contributes to the processes of meaning-making and “demands or suggests certain reading strategies” (Gray 2010, 26). In the case of books, paratexts are constituted by elements including the author’s name, covers, titles, prefaces, illustrations, notes, and even typography and paper. The museum can be regarded from the perspective of the paratext. Paradoxically, a volume dedicated to digital paratexts introduces its contents with a foreword that compares the museum with a paratext. Paintings’ frames, the wall space, illumination, and “do not touch” signs become “para-paintings” (Cronin 2014). Another example that calls to mind the museum as paratext is the analogy Hourston Hanks makes between the design of an exhibition and a book: the architectural order is “reminiscent of the conventional order and scales of characters, lines and pages of text” (Hanks 2012, 22). The “threshold” function of the paratext converts it into an essential part of the text and keys to the reading experience. As stated by Bal’s pertinent assertion, a narrative utterance “consists not of words or images alone, nor of the frame or frame-up of the installation, but of the productive tension between images, caption (words), and installation (sequence, height, light, combinations)” (Bal 2001, 187). Not surprisingly museum studies literature on narratives has paid attention to exhibition elements, such as graphics, because of their “interpretive significance”, suggesting that they “can be read on the same primary level as the other components that make up the exhibition, including the objects themselves” (Piehl and MacLeod 2012, 257).

Because this doctoral research considers art museums’ online resources as narrative texts, the concept of paratext applies to them. The notion of paratext expands to digital texts. As such, “interfaces, instructions, menus, statements, reviews, blog posts, and documentation belong to the new generation of paratexts” (Strehovec 2014, 47). The interface, an element that spatially determines how a text is accessed and determines interaction, is one of the “thresholds” that receives more attention. Jonathan Gray, a key name in paratextual theory, states:

Interface is part and parcel with paratext. It is one of the gateways we enter through to get things. In the digital era, you have all sorts of modifications of these gateways that we go through, and they are often like organizing systems. (Gray interviewed in Brookey 2017)

This idea is shared by Johanna Drucker, who makes a similar affirmation. For her, the interface is not an object but “a space of affordances and possibilities [...] a set of conditions, structured

relations” that enable readings (Drucker 2013). Notions discussed in the subsection on spatiality and temporality, in particular the concept of “spatial extension of the text”, converse with the ideas of paratext in general and interface specifically and claim the importance of the form in relation to the content of a text.

2.3 Narrative Structure

This subsection of the literature review stresses and explains the idea of narrative texts as structures formed by interconnected and indispensable components. The components are here examined separately, although narratives are “a whole” entity (Chatman 1978, 21). Narratology presents these components disjointed, when in actuality these components never exist independently (Bal 2017, 6). A first and necessary step in any narratological study of a narrative is to disentangle the structure of narratives. This exercise provides the grounds for understanding art museums and their online resources as narratives systematically. It denotes the narrative components that museum studies literature is interested in.

Narratology is engaged in extensive discussions about the structure of narratives. There is an agreement on the fact that there exist “countless forms” (Barthes and Duisit 1975) of narratives in a variety of media and signs (Bal 2017, 3). Hence, narratology reveals itself as the theory that “describes and classifies the infinite number of narratives” and provides “initial terms and principles” of them (Barthes and Duisit 1975). Articulating the basic structure of a narrative and its characteristics determines as well the degree of narrativity of art museums and ultimately online resources. Narrativity is a term that “designates the quality of being narrative” (Prince 2005). Basically, it refers to the “narrativeness” of narratives (Abbott 2013). Even though narratology is centred on prototypical cases (Ryan 2007), whether a narrative is prototypically recognised as such is determined by its degree of narrativity, and authors agree that this degree of narrativity on a text or artefact varies (Prince 2005; Bal 2017, 13; Ryan 2007). When a narrative is identified as such, it is because its distinctive and typical characteristics are “quantitatively predominant” in it (Bal 2017, 13). Digital media narratives often reject a prototypical structure and characteristics of narratives while proposing new paradigms. The literature here reviewed reveals this shift both with regards to narratology and museum studies literature. But before delving into the matter, to determine the narrativity of art museums’ online resources, the structure of narratives must be examined.

Authors affirm that narratives are constituted by events: “events are one of the reasons why stories are narrated” (Hühn 2011). The most basic notion of narratology highlights the concept of a narrative as a representation of a sequence or succession of events (Ryan 2007). An event is defined as “the transition from one state to another state” (Bal 2017, 5). With events, actors

are the other main constitutive element of the story of a narrative. Actors, also identified by the literature as existents or characters, have a key role in the generation of stories (Gerard 2003, 3). They are the “agents that perform actions” in the story (Bal 1977, 5). Those actions determine events, and therefore without actors, events would not exist. Most authors agree on the idea of actors not being necessarily human (Bal 1977, 5; Ryan 2007; Gerald Prince 2003, 71) although the analysis of fictional narratives have reinforced the opposite idea.

In reading museums as narratives, a required exercise is to identify the events and actors of their stories. Among the stories art museums tell through objects, one finds the stories of artistic styles or periods; stories of how a theme has been depicted by different artists or artistic schools; stories of an artist’s life conveyed through their oeuvre; and stories of a collector or an art critic who dedicated their lives to collecting and studying certain artworks. From the stages of the creation of an artwork, to its journey across time and space until it reaches the museum, events surround the existence of each artwork. An obvious actor in these stories is the artist who has created the artworks. As art museum stories narrate the “reception, ownership, and public display” of the artworks (Cuno 2011, 34-35), other actors of these stories are owners, dealers, and art critics. But the artwork itself can be an actor, too. Some propose an idea of objects with “biographies” and “social lives” of their own (Srinivasan et al. 2010, 740). In this way, objects, in some museum projects, are “brought to life”. Additionally, the artworks’ materials generate actions, such as deterioration and other physical and chemical transformations, either effectuated by artists and their technique or by environmental conditions.

Events and actors are the basis of any story; events are single but the narrative is “a sequential composite” (Chatman 1978, 21). The sequential ordering of events implies a linking relation between them that constitutes an array, called a “plot” (Chatman 1978, 43). A plot is understood as “the intelligible whole that governs a succession of events in a story” (Ricoeur 1981, 167). Russian formalists were the first to make a distinction between “fabula”, the events and story, and the “plot” that enchains events together and determines the way in which stories are combined and told (Propp 1968, 92). Propp, in his analysis of Russian tales, proposes a series of typical sequences as a classification for these combinations or plots. The basic formalist model of narrative structure is acknowledged, although it is further developed by other theorists. The plot is not unintentionally or autonomously generated. For this reason, in a narrative structure the plot “lies between the events of a narrative on the level of story and their presentation on the level of discourse” (Kukkonen 2013). But what, then, is the discourse? Structuralist narratology extends the modal and presentational quality of the plot to another component of the narrative structure: the discourse. The story, or “histoire” according to French structuralists (Genette 1972, 27), is the “what” of the narrative (Chatman 1978, 19; O’Neill 2005). It groups events, actors or characters, and other existents, such as the time and space in which the story takes place. On the contrary, the discourse element, or “fabula” as

other theorists such as Mieke Bal have chosen to denominate (Bal 2017, 5), is the “how” of the narrative (Chatman 1978, 19)—in sum, the way in which the story is presented, transmitted, or communicated. A narrative is rarely identical to the story. The distinction between story and discourse responds to “the traditional distinction between content and style/form/expression, subject matter and treatment, or matter and manner” (Shen 2005). According to this distinction, the discourse level of a narrative comprehends the authorship and readership of the narrative, its mediality, and the temporality and spatiality of the discourse, which should not be confounded with the ones of the story.

The question to be asked at this point is how the minimal and foundational narrative structure made of the story and the discourse is addressed in museum studies. Literature engaged with the study of both the “story” and “discourse” of narratives in museums is rather scarce. In the first paragraphs of her chapter on narratives, Bedford (2014, 57) briefly summarises the difference between story and discourse. Besides this example, Palombini’s article (2016) argues for a systematic analysis with a focus on the story elements of the narrative and on the discursive layer of storytelling. On a similar note, the Museums and the Web conference paper that reports on the CHESS research project (Roussou et al. 2015) describes a comprehensive approach to the production and evaluation of digital narratives, the project comprised the generation of plot-based stories and the design of the narrative discourse shaped by audience designated “personas”. Following the example of these pieces of literature, and taking into consideration the twofold basic structure of narratives, the subsequent subsections examine the key components of both the story and discourse layers of narratives. The aim of doing so is to provide a full picture of museums as narrative texts.

2.3 Historiography and narratives

The presence of history in art museums’ narratives is unquestionable. In analysing museums as narratives, a point to be discussed is the presence of factual events, time, and space. In beginning this section, it is deemed necessary to discuss differences and similarities between the words *history* and *story*. Both history and story have shared etymological origins in Latin and ancient Greek. However, whereas *history* in English refers to actual facts, *story* is related to fictional ones. Taking into consideration the native language of this thesis’s author (Spanish), in which the term “*historia*” is polysemic and holds the meanings both of history and story. The same polysemy exists in Romance languages such as French, with “*histoire*”, or in Italian, with “*storia*”, where the connection between narration and history is perhaps more obvious than in English language. Narratology is a theory predominantly concerned with fictional narratives, yet most theorists agree that despite the fact that “the fictional nature of the narrative is the standard” (Bal 2017, 4), the events of the story in a narrative can be “real or fictitious” (Genette

1972, 25). Events, a core component of narratives, have “a long, albeit changeable heritage in historiography” (Hüng 2011). In art museums one encounters the stories of each individual work of art, yet the discipline that presents them together in the exhibition space and catalogues is art history. Consequently “all museums, no matter what their subject, are museums of history” (Anderson 1989). In short, museums “represent history” (Porter 1996).

Historians have commonly chosen to report historical events in non-narrative and anti-narrative forms (White 1987). This does not contradict the argument of history as a narrative discipline (Munslow 2009, 17; Kidd 2014, 30). Narrativity, understood as the quality of being narrative, is a notion that once again helps reinforce this argument. History can present different degrees of narrativity. White asserts that “what distinguishes ‘historical’ from ‘fictional’ stories is first and foremost their content rather than their form” (White 1987, 27). Historians employ different strategies to “de-narratologise” history. If history is understood as a non-narrative form, it is because historians sometimes “de-chronologise” history, refusing to provide a linear representation of time (Ricoeur 1980, 29), which would require them “to tell a story with a well-marked beginning, middle and end phases” (White 1987, 2). An anti-narrative intention implies as well the negation of the author’s input in historical narration. Munslow (2007) criticises this practice and highlights the fact that history is not completely objective and scientific. For him, history encloses a certain level of fiction, deriving from the witnesses of historical events and the reflection and interpretation of individual historians. These non-narrative and anti-narrative strategies historians employ are used by museums too. Museum studies literature indicates that if museums intend to “narrativise” or accentuate the narrativity in the stories they present, they are required to employ the narrative methodologies and creativity (Roussou et al. 2015) typically used in fictional narratives. Palombini notices an intention of “harmonizing narrative freedom and historical truth” (2016). Often museums employ fictitious characters that narrate or interact with historical events (Roussou et al. 2015; Palombini 2016) or add suspension and other dramatic effects to the original plot (Palombini, 2016). Constructing tension, understood as “a sense of orderly unfolding”, arouses in readers a desire for resolution of the events (Austin 2012, 109). The interplay between fictional and factual that history introduces in museums is also revealed when the individual components of narratives, namely authorship, temporality, and spatiality, are analysed in more detail.

2.3 Authorship

In the same way as any other text, a narrative cannot exist without an author. For a story to be articulated into a narrative, a creator, maker, or composer is required (Prince 2003, 8; Jannidis 2005). Both the role and concept of the author are crucial to define and analyse a narrative text. Museum studies literature on narratives dedicates extensive accounts to interrogating museum

authorship and authority. Hence, in this subsection, the museum as author is examined from the angles offered by narratology. Beginning with an analysis of the characteristics that define authorship in the museum as collective, collaborative, and as a result of contextual factors, the subsection also addresses the narratorial agency of the museum as predominantly anonymous and in the third person and describes how digital media are modifying authorship.

Despite the fact that the museum, as author, is generally presented as an impersonal and univocal entity, it should not be overlooked that authorship in the museum is collective. Curators, assistant curators, editors, educators, etc. all author museums' narratives. Traditionally, the individualisation of the author in creative domains, such as literature or visual arts, has fuelled the myth of the "genius" (Foucault 1984, 101), which is put into question when the social and collaborative nature of the creative process emerges (Schönert 2014). Recent narratological accounts affirm that there is a "collaborative nature of most of what we presume to be singly authored works of texts and even media" (Golumbia 2014, 57). Authors highlight the necessity to distinguish between "mere contributors and genuine coauthors" (Bacharach and Tollefsen 2010) and to understand the relation between author, editor, and publisher, as much as market or social constraints affecting the creative process (Haynes 2005). The emergence of digital media has exposed "the disjunction between the image and the reality of authorship" (Haynes 2005), which is collaborative, since collaborative authorship is deemed to be even more important and transparent in digital media (Rettberg 2014, 78). What is concluded from these views is that a deeper analysis of the collective and collaborative authorship in the museum is needed. This analysis should address who are the authors of online resources and how the hierarchical authorial organisation is configured.

An application of the above ideas to the museological domain invites to consider how collective and collaborative authorship as well as institutional agendas are portrayed by museum studies literature. Regardless of the museum size, the museum authorship encompasses the voices of multiple individuals, providing and forming narratives as part of the institution. Museums' narratives are often anonymous, although sometimes they feature the names of curators who have authored them. But even when singular art curators are featured prominently in some exhibitions and publications, both physical and online, they work together with assistant curators, educators, editors, registrars, etc., although this might not be evidenced at all. Texts addressing the museum from a narratological perspective denote that museum authorship pertains not only to curators but also to the "large system of production" (Porter 1996) that constitutes the museum workforce. This includes curators as well as exhibition and graphic designers, professionals whose authorship is not always explicitly recognised (Piehl and MacLeod 2012, 257). It is in the milieu of digital scholarly publishing where critics note a "shift in author credits" that reflects "the collaborative approach to scholarly projects familiar to many digital humanists and increasingly to other scholars" (Goodyear 2016). Yet, this shift

appears to be something that museums only use with online resources aimed at scholarly audiences.

Regarding collective and collaborative authorship in the museum, narrative approaches to museums that discuss this matter are rarely found in literature. For example, Piehl and MacLeod (2012) claim that exhibition graphic designers ought to be considered authors of the exhibitions along with the curators, due to the collaboration between them. General museum studies texts, not relative to narratives, provide more evidence of the discussions in this area. For example, the two editions of a recent exhibition manual describe professional disciplines required to produce a successful physical exhibition. The authors of these manuals agree to include both “content specialists” (Piacente 2014, 233), a group represented by curators, researchers, and collections management personnel, in addition to various other professional roles, from educators, writers, exhibition designers, media specialists, audiovisual producers, project managers, conservators, revenue generation staff, marketing development staff, and evaluators (Piacente 2014, 233; Lord 2002, 5). As online resources gain popularity among museums, practical manuals that delve into their development emerge. Kalfatovic’s manual to create successful online exhibitions is attentive to the professionals involved in their production. He lists the positions of library or archive director, besides to the curator, designer, technical staff, conservator, editor, education consultant, and production staff (Kalfatovic 2002). Nevertheless, despite manuals providing a picture of authorship in the museum as collective, it does not enter discussions about authorial hierarchies and representation of collectiveness.

The dynamics of collective authorship imply collaboration among authors, which is not without difficulties. According to Walsh (1997):

The typical interpretive art museum label, for example, is the work of a committee of educators, editors, scholars, and administrators who not infrequently disagree. Even the simple line ‘attributed to’ can, in a museum label, conceal fierce behind-the-scenes debates over the nature of the art object to describe.

Returning to literature addressing digital narratives or storytelling, papers and articles focus on describing, although briefly, methods that can improve collaborative authoring. Specifically, “participatory design” is a process that seeks to actively involve all stakeholders (Roussou et al. 2015). The same authors have an interest in the implementation of “new workflows within the organization, the acquisition or training of different experts, and the management of technological requirements” (Roussou et al. 2015). This is deemed necessary because “digital storytelling requires synchronous, collaborative work among different departments, even with external experts, which clearly breaks open the traditional institution as we know it” (Roussou et al. 2015). This makes the challenges of collective and collaborative digital authorship in

online resources worth examining.

One additional point of discussion derives from the use of multimedia to author digital narratives. New media literature relative to authoring systems offers some insights into the matter. For example, Malloy expands the concept of author in relation to new media literature: the “writer” works “with a combination of words, literary practice, hardware, software, and interface design” (Malloy 2014). Malloy’s statement suggests that a single author can take care of the writing, software development, and interface design. Yet, multimedia authorship can be also interpreted from the perspective of collective authorship, meaning several individuals are responsible for the different aspects of the narrative. This is manifest in cases in which authors work with already existing platforms, which are themselves “authored” (Rettberg 2014, 78). This perspective is also reflected by literature on digital storytelling or narratives in museums. Authoring digital narratives would incorporate “a wide range of tasks—including scriptwriting and editing, image manipulation, voice-over narration, music selection, and timing” (Springer and Borst Brazas 2004). This text conveys that all of the different tasks are performed by an author. But it also invites to question whether curators should master all of these different tasks and acquire related skills to create digital narratives or if a more compartmented and collaborative approach to digital authorship is instead preferred. To find a partial answer to this question, it is necessary to venture into museum studies literature on online resources, which suggests that a specific expert figure with digital skills, the “digital curator”, should be introduced into museums to produce online publications (Goodyear 2016). Goodyear’s suggestion leads to question whether the new professional figure of the digital curator is welcomed by museums as online resources continue to be developed.

Critiques of the narrative approach to museums point to a lack of analysis on the constraints or challenges the institution faces when doing its work, such as creating exhibitions, publications, and online resources. This approach has ignored “competing agendas [...], the ‘messiness’ of the process itself” (Macdonald 1996, 5), and the fact that shortcomings “may be linked to lack of funding and time, or to practical constraints” (Mason 2006, 96). Indeed, in order to find some evidence of such accounts, additional research is needed, although some insights are provided in the literature relative to museums’ online resources. Something to be mentioned is that the above critiques forget that as much as museums encounter limitations, a favourable institutional context may as well encourage certain practices. For example, articles addressing online resources do not always reveal negative causes around their production. Liew (2006) focuses on the “critical factors” that enable online exhibitions, among which we find the “desire to experiment with the new medium”, “the availability of appropriate technology to facilitate that experimentation”, “exhibiting online was a better alternative to physical exhibitions”, “public interest”, and “availability of funding”. Similarly, different authors point to the benefits of online publishing, explaining what makes publications faster to produce and

more affordable (Whalen 2009; Quigley and Neely 2011).

Regardless of their interconnection, author and narrator should not be confounded. A narrator is an agent or “agency or ‘instance’” (Phelan and Booth 2005) that tells the story, not the real or “biographical” author of the narrative (Bal 1997, 16). A narrator is “immanent to or deductible” from the narrative (Prince 2003, 8), or “hypothesized” (Margolin 2013), and it is the author’s choice to have one narrator, or more, and how prominent it would be (Chatman 1978, 33). Prince also explains that a narrator can be “more or less overt, knowledgeable, ubiquitous, self-conscious, and reliable” regarding the story (Prince 2003, 65). Nowadays museums may use a variety of narrators in their narratives, from artefacts (Kraemer 2007) or curators—the actual authors of museum narratives—when the texts are signed by them (Fraser and Coulson 2012, 225), to fictional historical persons (Roussou et al. 2015). Yet, the most common narrator is the museum itself, which presents itself as an anonymous, omniscient narrator who uses the third person. This narrator presents the museum as impersonal but also authoritative. Museums adopt this practice from history. As Munslow remarks, “generally history is assumed to provide us with the security of the omniscient and impersonal ‘news from nowhere’ narration of the past” (Munslow 2007, 44). In their enlightening and foundational article on art history and semiotics, Bal and Bryson describe the nature of historical narration: “it is part of the ‘scientific’ quality of ‘modernist’ causal narratives that the position of the analyst is not included in the narrative account” (Bal and Bryson 1991). Bal and Bryson remain critical about this position and point out that the “apartness” and “objectivity” of the narration can be interpreted “as nonrecognition and as disavowal of the creative authorial function of the art historian” (Bal and Bryson 1991). The commentary and interrogation of the historical narration acquires an additional nuance when the idea of the “death of the author” is inserted in this discussion (Munslow 2007, 44). Barthes affirms that “writing is that neutral, composite, oblique space where our subject slips away, the negative where all identity is lost, starting with the very identity of the body writing” (Barthes 1977, 142). The detachment that exists between the author and their work is more accentuated in historical narratives and omniscient narration. This leads to question whether museums should highlight the subjectivity of the history they present or instead maintain an objective and neutral status. Using a first person narrator over a third-person one might make the difference, but this is not the only strategy museums may use.

Museum studies literature on narratives has characterised the museum as an institutional entity whose discourse affects the stories and history they present to the audience. Museums decide what is worth conservation, exhibition, and description. The art museum discourse is constituted by epistemes that legitimate the canons that dictate what is good art and what are the stories that should be transmitted from what viewpoint. Bal (1992), Porter (1996), and Lidchi (1997) agree that while the museum’s aim is to present objective, accurate, and authentic historical facts in the narratives of their objects, omissions, biases, and assumptions

are inevitably, and often unintentionally, present in these narratives. In sum, museums are focalisers. Bal uses this term to designate what western museums do when they represent non-western cultures from a western perspective (1992, 586). Focalisation, a term introduced by Genette (1980, 194), is understood as “point of view” or “perspectival filter” (Jahn 2007, 94). It responds to the questions “‘who sees?’ or ‘whose perspective orients the text?’” (Aczel 2005) and is not linked necessarily to the question of “who speaks”, the narrator or narrators of the narrative. Bal asserts that focalisation is intrinsic to narratives: “Whenever events are presented, it is from within a certain vision”, and she continues, pointing out that “storytelling is inevitably slanted or subjective in nature. [...] It is of course possible to attempt to give an objective picture of the facts” (1996, 132). In the current historical moment, multiple but legitimate truths are recognised. Accordingly, narratives are “likely to be less complete, more fragmentary, and to consist of the elements of many narratives that can be combined in a range of ways rather to be completed finished story” (Hooper-Greenhill 2000, 30-31). The contentious but widespread affirmation that museums are not neutral is acknowledged not only by critics but also by museums themselves, as it motivates them to rethink institutional authorship. Digital media have introduced novel authorship frameworks that, if adopted by museums’ online resources, would help them transform their discourse. There is a new potential for museums to diversify and expand their narratives as much as to convey the complexity of knowledge.

In response to the above ideas, becoming more objective, inclusive, and open is a concern all museums share. Although some digital media has neither introduced these concerns nor invented the strategies, concepts, and approaches museums employ to transform their discourse, it offers multiple possibilities to do so through narratives (Wong 2015). As an attempt to make museums more open, institutions involve the audience in authoring processes. Museums have designed, and still design, programs and physical exhibitions that involve visitors in the generation of personal stories, converting them into authors and/or narrators (Bedford 2001). Nevertheless, there is a common belief that the hypertext and the Web are democratic instruments, capable of opposing the “unassailable voice” museums carry with themselves (Walsh 1997). As Weible states “on the web anyone could be a curator or art historian promoting their personal views” (2011). So if museums embrace its full potential, they can decidedly transform the institutional authority. When the museum embraces the Web, it is supposed to accommodate the voices of external authors even more effectively and empower audiences.

Museum studies literature recognise the agency of individuals who are encouraged to perform more decisions as readers and even authorise their own narratives within predetermined parameters. Kidd’s *Museums in the Mediascape* (2014) has a chapter on user-generated content that reviews the various ways in which visitors can co-author narratives, from user curated personal online exhibitions, to participatory digital art pieces or

online-mediated crowdsourced physical exhibitions. Similar practices are described and praised in several articles. For example, an early project at the National Gallery of Art in Washington, D.C., (Springer and Borst Brazas 2004) was developed to involve students in digital storytelling practice. In this educational project students elaborated a digital story by reusing images and materials from the museum. Fisher et al. (2008) describe a project in which participants created both their own “masterpiece” using elements from the museum works of art. This was followed by a recording of a description of the story they crafted with the collage. It should be noted that none of these two examples use the museum website to host the students’ creations. Online resources are rarely used as co-authoring platforms. The *Timeweb* project of The Andy Warhol Museum was an online resource that facilitated co-authoring tools for scholars to create new content of the resource (Knutson 2013). All these projects speak about collective authorship that, although guided and arbitrated by the institution, include external voices and other perspectives. The museum makes an exercise of focalisation in including perspectives from outside of the institution.

In ending this subsection on authorship, some themes to further explore within this research are identified. First, this subsection addresses the different characteristics of museum authorship. Authorship in museums is collective, collaborative, and is influenced by a series of factors. There is a necessity to provide an empirical base in order to articulate the way in which collective and collaborative authorship is defined in online resources that would expand, or rather overturn, existing literature. Moreover, further discussion on factors influencing authoring mechanisms in online resources is needed. No evidence of this is provided by texts on museums narratives. As the experience of this thesis’s author confirms, these factors are varied and depend both on the nature of projects and on institutional values. This subsection also exposes the changing nature of the roles and skills of those involved in the work with digital media in museums. Arguments around this idea originate in the literature on online resources instead of on museums’ narrative texts. The principal author of museum narratives, the curator, is the centre of analysis with regards to skills acquisition. Whether curators’ skills should be rethought as they author online resources requires further attention. Lastly, the literature denotes a strong critique of the rigid institutional authorship of the museum. When this institutional authorship is systematically regarded from narratology—from the terms narrator, voice, and focalisation—its complexities and the reasons to understand why museum authority is presented to us in the way it does are revealed. The literature affirms that digital media can dilute and transform museum authorship, yet more evidence is needed. This is especially the case with regards to online resources, which are rarely presented in digital narratives literature as platforms for co-authorship. Therefore, this idea of a museum’s institutional authorship invites us to pose the following research questions: Do online resources actually present art museums’ authorship differently? Is institutional authorship transformed or diluted online?

2.3 Narrative mediality

Understanding how art museums' narrative mediality is addressed by the literature is the objective of the present subsection. Narratology adopts a definition of media that becomes useful when examining the characteristics of media that museum studies is concerned with. As Marie-Laure Ryan points out, "medium is a category that truly makes a difference as to what stories can be evoked or told, how they are presented, why they are communicated, and how they are experienced" (Ryan 2006, 25). Studying narratives in art museums inevitably invites to debate mediality. Mediality translates as the "medial qualities" of a specific medium (Thon 2014, 334) and, when used in the context of narratology, as the way in which a narrative "is conditioned by the medium in which it is realized" (Ryan 2012). But defining what is a medium is necessary before proceeding with an analysis of the affordances media offer to narratives.

Narratology theorist Marie-Laure Ryan is aware of the ambiguous and multidimensional definition of medium and discusses two common meanings of "medium", as they provide an explication for narrative mediality (Ryan 2006). One meaning responds to the material means or technique, while the other is defined as a channel of mass communication (OED 2018). Ryan explains that the first meaning is understood as the "semiotic" definition of medium that regards media as languages, while the second is a "transmissive" one (Ryan 2006, 17). As Ryan briefly summarises, the semiotic approach to media distinguishes three media families: "verbal, visual, and aural" (Ryan 2006, 18). This approach looks at the codes and sensory channels of each medium. These two definitions do not present themselves independently in our experience with media. For instance, and with regards to the digital medium, a single transmission channel is used, the Web or a program, but multiple semiotic dimensions from all media families are presented to us simultaneously (Monfort 2007, 172). The opposite case is presented to us if a print book and a digital one are compared. While the transmission channel is different for both, they are semiotically similar (Thon 2014, 334).

Narratives are commonly regarded as a linguistic or verbal matter, yet all authors agree that narratives operate in multiple media, they are presented to us in an "almost infinite diversity of forms" (Genette 1977, 79). Narratology is a theory that "transcends disciplines and media" (Marie Laure Ryan 2006; Chatman 1978, 28; Bal 2001, 77). Recalling the division between story and discourse in narratives, the situation of mediality within this basic structure explains why narratives do not discriminate media. As Marie Laure Ryan clarifies, the story of a narrative "is not a representation encoded in material signs" (Ryan 2006, 7). Hence, mediality is found at the discourse level of a narrative. The same story can be represented by different media. Clear examples of this are common and frequent: everyone is familiar with a novel that has been adapted into a movie, or a biblical story which has been represented into a painting. Every medium offers unique narrative resources (Ryan 2006, 4). As authors transfer stories

from one medium to another, both advantages and limitations provided by each medium are perceived.

All museums are multimedial (Bal 2001, 164) but art museums represent a special case. When the art museum is regarded from its medial dimension and according to semiotic principles, it operates from verbal and visual semiotic families, but in its visuality prevails over the verbal. Mieke Bal affirms that exhibitions are predominantly a “visual discourse” (Bal 2007, 71). Art together with architecture belong to the visual realm, whereas text labels that accompany artworks pertain to the verbal domain. Art museum publications operate within the same semiotic families (Hughes 2010). Art museums’ narratives rely upon the narrative qualities of the visual as they do upon the verbal. The dichotomy between “word” and “image” is one that affects not only the art museum but also many other domains. Studies that examine the binary “are concerned with the study of encounters and tensions, collaborations and hostilities” between both (Engberg 2014, 526-527). As Kristeller pointed out in his renowned article “The Modern System of the Arts: A Study in the History of Aesthetics” (1951), in ancient Greece and Rome, painting, sculpture, and architecture had a lower social and intellectual prestige than poetry, rhetoric, and music, mainly because of their stronger connection with manual labour. The prevalence of the word over the image then manifested a hierarchical ordering for human knowledge and intellect. Within this hierarchical order, the visual arts did not hold the highest place. The current status of visual art is seen as a consequence of a long transformation of cultural perceptions and conventions across centuries of practice. Recent theory notes a shift in the state of the visual. Some authors even stress the strengths of the visual over the verbal. Among those, W. J. T. Mitchell’s work is particularly significant. He states that images are the principal currency of media. From his perspective “speech and writing, moreover, are themselves simply two kinds of media, the one embodied in acoustic images, the other in graphic images” (Mitchell 2008, 216). From the graphic signs that form letters to the layout of a printed page, most verbal representations rely on visual laws. The visual conditions the constitution of new media, including cinematography and digital media, to the extent that some authors are concerned with the “encroachment of the visual into territory formerly held almost exclusively by text and print” (Hocks and Kendrick 2003, 1). Lastly, there are advocates of a conciliatory perspective who focus their efforts on examining the “dynamic interplay” existing between words and images that new media fosters (Hocks and Kendrick 2003, 1).

General museum studies literature has given attention to the interplay between the verbal and the visual in exhibitions and publications, highlighting different aspects of it. A very important element of the text-image interplay in exhibitions is the interpretive label that accompanies artworks. From practical manuals to critical texts, the role and effectiveness of museum labels is under interrogation. In her popular guide on museum labels, Serrel places the

label at the centre of the narrative reading experience: “readers look back and forth between the label and the object, following the details of the narrative” (Serrell 1996, 14). This reading experience is not always seamless. In practice, visitors often struggle to grasp the stories museum intend to communicate. Shortcomings derived from poorly or wrongly executed museum labels are contradictions between the visual and the verbal (Bal 1992, 572). The cohesiveness of the narrative (Serrell 1996, 1) together with the “iterative [...] process of word selection, image selection, word modification, and nonverbal content modification” (Serrell 1996, 147) are necessary to create good exhibition labels. As Mieke Bal rightly points out, exhibitions “benefit from the critical edge brought in by the verbal accompaniments” (Bal 1992, 572). Indeed, Bal’s work focuses on confusing and conflicting museum labels in natural history museums (Bal 1992) as much as it does with enlightening ones, as her essay on reading Caravaggio’s work shows (Bal 2001).

With regards to art museum publications, the interrelation between word and image, although an extremely important feature, does not attract the same level of attention in museum studies literature. But one can read between the lines of foundational essays of museum studies, such as Malraux’s “The Museum without Walls”, and interpret his praise for photography as a manifestation of what a museum can do, juxtaposing photographs to essays in their illustrated catalogues. Indeed, photographic advancements characterise the museum catalogue. Although catalogues are more strongly verbal than visual, thanks to photography, in publications images iterate with text with “relative ease” (Hughes 2010). The ease of iteration between image and text is even more pronounced in digital publications. This is an advantage art museums can take. According to research on art-historical digital publishing, digital media offers possibilities for achieving a more fruitful interplay between images and text since words and images can become synchronised (Ballon and Westermann 2006). In online publications “the traditional dominance of text over image, a long-time impediment for art history, is adjusting to a more productive balance” (Rhyne 2013). As museums adopt digital media to tell stories, analogous concerns emerge from work on digital narratives. Authors are concerned with the integration of different media in a “layered way” (Grant 2014) or the visual presentation of a story without challenging the text (Birchall and Faherty 2016) in websites and online resources. Moreover, multimediality is expanded, and media families are not just relative to the verbal and the visual. Authors affirm that in digital storytelling, words and images are integrated with other media, such as video and audio (Wong 2015; Grant 2014), that incorporate the aural to the visual and textual. Visual rhetorical devices, understood as diagrams like trees, streams, chains, and geometric shapes (Davis et al. 2016), have been traditionally used to tell stories through the visual representation of data. When they become digital, motion and sound are merged into these visual rhetorical devices.

Other accounts on digital storytelling or narratives in museums use the “transmissive”

meaning of medium instead of the semiotic one. The concept of transmedia narrative is employed in those cases (Wong 2015; Kidd 2014). These narratives “use the capacities of digital media to present stories through multiple contexts that intersect and interact” (Wong 2015). Transmedia storytelling not only takes place online but also “in an exhibition, part of a publication, as part of a mobile experience” (Wyman et al. 2011). In this way, the narrative extends across multiple media and implies that a reader can access it “from a multitude of entry points – in diverse spaces and in varying states of ‘completion’” (Kidd 2014, 23). According to the transmedia framework, a museum narrative is not only multimedia but transmedia: it is represented through a variety of media and across different media.

In sum, an understanding of the narrative mediality of the museum, and more specifically of the art museum, provides a picture of a multimedial museum in which the verbal and visual coexist and a transmedial museum that presents narratives through different media channels. Literature suggests that exhibitions are prevalently visual while publications are more verbal. Yet as the digital medium promises a more balanced interrelation between them, research is required to interrogate if word or image are privileged over the other in the narratives art museums’ online resources present or if they are treated as equal. Literature on museums digital narratives does not engage fully in debates around the visual and verbal. Hence, research seeks to fill a gap. Moreover, since digital narrative medial models are inherited from the exhibition and the publication forms, it should be asked whether the interrelationship between word and image that online resources display relies more on one model than the other.

2.3 Spatiality and temporality

Stories occur in historical time and space but the narration of these stories evolves over time and takes place in a space. In continuing to review the core components of a narrative, characteristics and nuances of temporality and spatiality in museums are examined. Time and space of the telling, the discourse, are strongly determined by the media of narratives, and for that reason temporality and spatiality are distinctive from museums’ media configuration. This subsection explores definitions of time and space that narratology proposes and reviews museum studies literature relative to time and space in narratives and online resources.

Basic definitions of narrative time and space reference to the sequential and temporal unfolding of the events of a story forming a plot (Ryan 1991, 109; Ricoeur 1981, 167), on the one hand, and, on the other hand, to the environment in which the story takes place (Buchholz and Jahn 2005; Prince 2003, 86) and the existents of a story act (Chatman 1978, 96). This spatio-temporal complex constitutes the “setting” of the story (Prince 1982, 73). But time and space are also present in the discourse of a narrative. Several authors distinguish between the

“time of the story” and the “time of narrating” (Genette 1972, 215-227), called “story time” and “discourse time” by others (Chatman 1978, 62; Fludernik, 2005); and “story space” and “discourse space” (Chatman 1978, 96). Discourse time is, according to Genette, the time of the narrating act, for example, the duration of an oral narration or the time spent in reading a narrative. In the case of discourse space, Chatman defines it as the frame that delimits the story space (Chatman 1978, 96) or the “focus of spatial attention”, the area to which the reader’s attention is directed by the discourse (1978, 102). However, Ryan argues that Chatman’s notion of “discourse space” does not correlate with “discourse time” and suggests employing the idea of “spatial extension of the text” instead. This conception of discourse space as spatial extension of the text “refers to the spatiality of the text as material object and to the dimensionality of the interface to with the reader, spectator or user” (Ryan 2014).

The unique medial configuration of museums enables the production narratives that employ particular temporal and spatial arrangements. Different media have been characterised as either spatial or temporal, or a mix of both. Lessing’s renowned piece of work “Laocoon: An Essay on the Limits of Painting and Poetry” is referenced by Marie-Laure Ryan as she introduces discussions on the implications of media in narratives’ temporality and spatiality (Ryan 2006; Ryan 2012). Lessing established the basis for defining written or verbal narratives (“poetry” in Lessing’s terms) as temporal and visual narratives (designated as “painting”) as spatial. He explains that in the visual realm, signs “can be combined only in space”, whereas in the verbal domain, although words are represented visually, they follow a “progressive action, the various parts of which follow one another in time” (Lessing 1984 [1836], 90). Lessing reinforces his argument by pointing out that although visual signs are viewed separately, viewers unite different signs and make a whole, all of it with “amazing rapidity” (Lessing 1984 [1836], 120). Reading instead would require more time. Among the limitations of Lessing’s outlook, there is a lack of attention to aural media, which is considered temporal (Bal 2017, 66). Moreover, it overlooks the fact that narrative mediality is not purely verbal, visual, or aural, but a combination of them. This implies that representations and uses of time and space vary across media. For example, a movie uses verbal and aural signs as much as visual. Therefore, when one watches a movie, verbal and aural signs unfold in time, yet space is predominantly visual. In art museums, where mediality is visual as well as verbal (but more visual than verbal), narratives can be substantially more spatial. It is expected that museums’ online resources are predominantly spatial narratives. But how the spatiality of the visual medium is articulated in online resources necessitates further attention and research.

Preziosi affirms that museum visitors “walk through history” (Preziosi 2006, 50) and that factuality is inherent to museums’ story time and space. The literature relative to museum narratives does not engage often in discussions on story time and space, but when it does, the focus is on how these two elements are represented in museums physically and digitally.

Literature also shows that the types of representations of story time and space in exhibitions do not differ substantially from the ones existing in digital media. However, the literature calls into question the accuracy and effectiveness of digital representations of time and space. According to Palombini, some museum narratives use the model of the “time-machine” (Palombini 2016) to reenact stories, but others connect past and present and emphasise a contemporary perspective on past events (Palombini 2016). Regarding “story space”, this is not an aspect of history museums often replicate. Exceptions to the norm are period rooms and buildings displayed in some art museums’ decorative arts sections or archaeological museums. Literature on museums’ narratives sometimes addresses the reconstruction of spaces. For example, Bedford (2001) describes the use of “object theatres” which recreate original settings around an object. Palombini (2016) refers to the use of digital technologies to represent historical spaces. He is particularly critical with this method, as he realises that resulting representations, digital or not, but particularly digital, “may confuse the sensorial quality of the representation and the exactness of the represented information” (2016). According to him, the aim of these representations is not merely descriptive, if employed in a narrative they have a suggestive intention that helps to immerse the reader in the narrative they provide a rather subjective view. An alternative to these representations of story time and space is facilitated by “visual rhetorical devices” (Davis et al. 2016). These devices are visual representations of chronological time in timelines and maps. They conceptualise story time and space for their rapid and easy understanding in analogue media, exhibitions and print books, as well as in digital environments. Worth pointing out is that none of the authors mention that the most common representations of historical time and space in museums’ galleries and publications are textual. The dates, locations of origin, and other provenance data are merely represented in written form in the texts of labels and the essays of catalogues.

Museums however have “special and controversial relationship with time and history”, since the function of the museum is to preserve objects from time as much as it is to reintroduce and make them relevant to the present time (Giebelhausen 2012, 234). Museums are institutions that seek permanence and stability as much as renovation and change. Artistic objects, as actors and witnesses of history, acquire permanence when displayed in museums. This contrasts with the transient quality of the temporal arrangement of artworks in museums’ exhibitions (Kossak 2012). Ideas of permanence and ephemerality can be understood from the concept of “discourse time”, if discourse time, the time of the “narrating act”, in a museum is interpreted as the duration of an exhibition. Therefore, the temporal nature of the museum discourse is conflicted between permanence and ephemerality. This conflict also extends to the digital medium. This literature review discusses temporal aspects of exhibitions and publications and shows a change in the temporal logic. Exhibitions were temporary and publications were stable but now they can be both changing and permanent. As section 2.2 of this literature review argues, the digital medium is seen as a storing solution as much as it is dynamic and evolving.

How can a more accurate definition of temporality regarding online resources be provided?

The notion of discourse time is also implicit in the texts addressing digital narratives in museums. Literature presupposes that digital visits are fast-paced while physical visits to a gallery require, or impose, slower viewing and reading patterns. The short duration of digital “visits” is seen negatively, because it implies a lack of engagement of users who “snack” content and go from page to page clicking on hyperlinks (Birchall and Faherty 2016). Weaving “moments of contemplation” into the narrative flow (Kraemer 2007), similar to the ones visitors experience in a physical museum, may stretch online visits. This is achieved through modifications of discourse space and the spatial extension of the contents. Some museums’ online resources use vertical linear interfaces and parallax effects to “restore a sense of the scale and pace of museum experiences” (Birchall and Faherty 2016). In this way, the narrative would invite the audience to slow down the online visit and read the text word-by-word, step-by-step (Birchall and Faherty 2016). Yet, some question the efficacy of the linear parallax-based model and state that users tend to skim pieces of content (Samis and Svenonius 2015). The contradictory opinion suggests that more analysis and comparison between multi-page and linear websites is needed to understand the implications of different discourse times and interfaces design.

The idea of museum cannot be understood without considering its strong spatial configuration. The usage and function of space in museums’ narratives is an ineludible subject of debate in museum studies literature to the point that museums’ narratives are by definition spatial (Mason 2006). Works of art are situated in space. The ordering and disposition of artworks in walls and galleries might be more or less intentionally narrative, moving from “showing” to “telling” (Hillier and Tzortzi 2006, 293), yet it creates connections between individual artworks. These kinds of connections are intrinsic to the museum’s syntax (Bryson 2001, 8) and can be aesthetic, historical, or thematic, as pointed out by authors, namely Mieke Bal, in her reading of Caravaggio’s and Baglione’s grouping at Berlin’s Gemäldegalerie (Bal 2001). In a museum exhibition, the position of artworks elicit interpretation, or meaning-making, as others chose to denominate (Falk 2009). This intentional positioning of artworks in museums is a perfect illustration of the term “discourse space”, as the way in which artworks are hung directs the focus of attention to them. Museums have mastered display techniques that support narratives. Galleries are laid out to allow circulation across rooms, shaping patterns of visit. Works of art are hung according to certain standards that dictate spatial parameters, such as distance between pieces, placement of labels, and illumination. Although there are variations of these spatial parameters, the museum “constitutes a more or less well-defined spatial type” (Hillier and Tzortzi 2006, 282). Museum studies narrative literature does not pay attention to the two dimensional space of museum catalogue pages, but the integration of images and text in the page and their spatial organisation can be regarded as

elements of a narrative in the same way that artworks are arranged in a museum gallery. What should be questioned now is how space is characterised in online resources in particular, and in the digital medium in general. As the literature affirms above, the museum is a “well-defined spatial type”. But is space in online resources as clearly defined?

Among the few articles centred on the spatial dimension of digital narratives in museums—although they employ the term *storytelling*—more attention is given to two-dimensional space of the interface, in which the concept of the “spatial extension of the text” is implicit, than to three-dimensional models that replicate galleries. A post of the San Francisco Museum of Modern Art, SFMoMA (Grant 2014) is concerned with the effectiveness of museums’ websites interfaces. In Web pages, different text lengths and the arrangement of images in relation to written text posit challenges to reading experiences. Interfaces should support a layered storytelling that integrates text, images, and other multimedia contents, in order to “make the ‘read more’ or ‘related stories’ content more inviting” without “breaking the reading experience” (Grant 2014). However this is something that museum do not always achieve in their Web pages. Samis and Svenonius’ paper (2015) exploring interface models that employ directionality, vertical and horizontal, proves the way in which directionality enables reading experiences. The authors of the paper also agree that early multimedia projects in museums offered “visual and acoustic treatments evocative of their subjects” now missing from websites that relinquish visuality and sensorial effects to “multi-platform publishing, shareability and responsive design” (2015) and employ flat two dimensional design. Interestingly, literature on digital museums’ narratives often overlooks replicated three dimensional gallery spaces. And the literature that pays attention to it (Kraemer 2006) is merely descriptive, and focused on how to make 3D technology affordable to smaller institutions that aim to offer more immersive experiences (Valtolina 2016). This literature does not interrogate the reading or interpretive experience resulting from these reconstructed spaces as the literature on architectural space and two dimensional space does.

Recalling the notions of events and plot, narratology states that a plot foregrounds a temporal and causal succession of events (Kukkonen 2014). Stories are thought to move forward—they have a beginning, a middle, and an end (Abbott 2007, 39)—although plots might reject their linear order, as argued in the following lines. The sequentiality of a plot is strongly determined by temporality, and in fact “one of the least controversial claims of contemporary narratology is that a narrative text is the representation of a number of events in a time sequence” (Ryan 1991, 109). Some authors affirm that temporality is an essential component of a narrative to be considered as such, while spatiality is conditional (Prince 2003). A minimal story can do “without indications of space altogether, yet always retain a kernel of temporal order” (Buchholz and Jahn 2005). However, it is worth noting that the spatial disposition of the visual and verbal signs also condition the linearity of the narrative or the lack of thereof. As

narratological literature arguments, words, which are situated in two-dimensional spaces, are read character-by-character; words cannot be read backwards, as linguistic signifiers are linear (Genette 1972, 34). In a similar fashion, the codex structure is dominated by linearity, a characteristic inherited from its precedent, the papyrus scroll (Aarseth 1997, 47).

Because museums are constituted by architectural spaces, “the space of a museum presupposes a walking tour, an order in which the exhibits and panels are to be viewed and read” (Bal 1992, 561). Therefore, if an exhibition presents a linear narrative, it would be predominantly spatial. When a narrative loop, understood as the linear structure with a beginning, middle, and end, is used in an exhibition, it impels the “reader” to go in one direction (Hanks 2012, 27). For narrative purposes, in museums “the rigid structure of linearity can be an impediment” (Skolnick 2012, 92). If linearity can be an impediment to narrative, it is because it does not allow the visitor to own the narrative.

Aarseth claims that “for a text to be nonlinear, it must have a positive distinction: the ability to vary, to produce different courses” (Aarseth 1997, 41). Text variations and production of multiple paths in narratives are achieved in different media. The absence or rejection to linearity characterises narratives in the digital medium but is not unique to it. Novels such as Cortazar’s *Rayuela*, or novels in which the reader chooses their own adventure, exploit nonlinearity in literature (Aarseth 1997). Likewise, architectural space invites the “reader” of a museum exhibition to go into multiple directions. Several authors have indeed approached anticipations to the hypertext by examining previous media. Huhtamo’s media archaeology outlook on virtual museums (2009) refers to early twentieth-century avant-garde artistic production as the origin of exhibitions and resources museums create digitally. The work of artists, such as László Moholy-Nagy, El Lissitzky, Herbert Bayer, and Frederick Kiesler, reconfigures the exhibition space emphasising nonlinearity. Huhtamo refers to Frederick Kiesler’s work from 1924, the “L and T” exhibition system, that employs supporting structures that provide additional but non-permanent walls to hang artworks and re-articulate existing space (Huhtamo 2009, 125). This has clear implications in the way the visitor of an exhibition reads it, who is allowed to move into different directions and look at different pieces. New media art theorists Graham and Cook (2010, 21) consider the more recent exhibition *Les Immatériaux*, curated by Jean-François Lyotard at the Centre Pompidou in 1985, a precursor of new media exhibitions and a contribution to the debate on the communications revolution before the Internet was widely adopted. Lyotard’s exhibition concept and design also challenged linearity, as visitors’ attention was triggered by multiple media with which they might interact or not. The *Les Immatériaux* exhibition design was devised as a network that visitors would navigate driven by their own curiosity. Interestingly, Lyotard explicitly mentions Le Louvre as the museological model that *Les Immatériaux* contests. The visiting experience conceived by Lyotard is described as follows:

The eye will be deprived of the exclusive privilege it enjoys in the modern gallery. Not will there be a clearly signposted itinerary, given the uneasy reflection which the exhibition hopes to provoke. (...) The visitor, passing from one to another (region), becomes an investigator; he is accosted by the voices and the music, as well as the sites he sees. His own individual itinerary might be recorded on a memory card, and given to him in the form of a printout itinerary when he leaves. (Lyotard 1996, 168-169)

Both examples, Kiesler's "L and T system" and Lyotard's *Les Immatériaux*, provide the "reader" with variety and multiple options to generate a sequence of events or plot that result into narratives which are as different as the readers' choices.

The hypertext, one of the main constituents of the digital medium, provides a kind of sequentiality that challenges linearity (Landow 2006, 215). Hyperlinks "control the temporal unfolding of the text" but are also spatial, as they prevent "a linear progression" through the spatial disposition of the text (Ryan 2014) and take readers to non-consecutive or adjacent areas of a Web page or different pages. The literature shows that art museums' online resources take advantage of this capacity as they use hyperlinks in various ways and predominantly reject linearity (Birchall and Faherty 2016). For instance, the interactive timeline developed by the Warhol Museum to narrate the artist's life opts for a "rhizomatic" approach, in which "links emerged in many directions" in order to "suggest the multidimensional intersections of influences and events across time and space" (Knutson 2013, 147) instead of using a chronological timeline that follows a linear progression from one event to the consecutive event. Paradoxically, some museums' online resources are designed to maintain some degree of linearity while supporting the hyperlink nonlinearity. An online resource can support "the linear narrative as conceived by the authors and stands as a resource suitable for searching and browsing" (Quigley and Neely 2011). This suggests that nonlinearity serves to some narrative authoring modes more effectively than to others. The degree of authority in a hypertextual narrative is determined by the usage the author makes of linearity. Indeed, "even hypertext can be a much stronger linear medium than the codex, should its author decide so" (Aarseth 1997, 46-47). But why would an author favour linearity over nonlinearity in a hypertextual narrative?

As George P. Landow affirms, the hypertext calls into question fixed sequences, the definite beginning and ending of a narrative, a story's magnitude, and the unity or wholeness of a narrative (Landow 2006, 218). All characteristics that determine the degree of narrativity of a narrative. Nonlinearity can put the narrativity of a narrative at risk. Recalling the discussion on databases and narrative from a previous section of this literature review, hypertexts are built upon databases, and the database is in essence a non-narrative structure. Therefore, in order to provide narrativity, some principles of nonlinearity should be challenged or rejected. As

explained above, some museums employ vertical scrolling interfaces to impose linearity onto their narratives (Birchall and Faherty 2016). These interfaces favour fixed sequences, clear beginnings and endings, and delimit the magnitude and unity of the narrative. In fact, “presented with a long scroll, we are offered no true choice except how long we are willing to persist” (Samis and Svenonius 2015). Hyperlinks, if added to these vertical scrolling narratives, are consciously designed to prevent readers from abandoning the narrative, for example expanding content with scrolling animations or pop-up windows. Museums using these linear interfaces expect changes in discourse time, reading would be slower and invite deeper experiences with the narrative. Recent museums’ online resources employ linear narratives to “restore a sense of the scale and pace of museum experiences” (Birchall and Faherty 2016). The narrative would invite the audience to slow down the online visit and read the text, a strongly linear narrative requires to follow the path designed by the author, word-by-word, step-by-step, taking the time necessary to read it fully. This can be achieved with vertical interfaces, which should be scrolled down like a papyrus in order to read the text. Linearity, or the lack of thereof, is not exclusive to the temporal domain of narratives; spatiality also determines it.

The discussion on temporality and spatiality exposes the different notions or levels of time and space in the narrative spectrum. Narratology separates the time and space of the story and the time and space of the discourse. Museum studies literature on narratives addresses time and space aspects thoroughly, but some matters remain open to debate. First of all, research should address what kinds of representations of story time and story space are used in online resources and whether they differ or not from the ones described by the literature. At the discourse level, time and space characterise museums’ narratives complex configuration. In terms of temporality, the literature exposes a debate on the nature of museums as stable institutions which develop ephemeral exhibitions that, when digitally remediated, see their temporal character transformed. These assertions coincide with the discussion on temporality and online resources types this literature reviews in section 2.2. Two questions should be posed in this regard. The first, what is the temporal characterisation of online resources? And the second, if different temporal notions belong or not to the two typologies, exhibitions and publications. As for what concerns other forms of discourse time in museums, it is argued that the museum invites a slow-paced and concentrated visit while strolling the galleries, which the digital medium transforms. This is seen negatively by some who in response seek to reintroduce slowness in online resources. The literature is centred on the objective of restoring the slowness of physical visits and disregards faster interactions. Research should put into question the literature affirmations and empirically compare fast and slow visit or reading times to fully understand their implications.

This subsection concludes that architectural forms of the museum determine the qualities of discourse space in museums’ narratives, and the codex those of the publication discourse space.

Museums' galleries and publications are well defined spatial types, but this is not as clear in the case of online resources that rethink exhibitions and publications. Section 2.2 highlights the issue as well. Research should look at how three and two dimensions characterise and make for recognisable online resources' spatial types. Last but not least, the present subsection affirms that linearity and nonlinearity result from a combination of spatial and temporal parameters. While nonlinearity is characteristic of the museum space and digital medium, printed catalogues and some online resources exploit linearity in the narratives they present. This allows a deeper understanding of how museums use linearity and nonlinearity in online resources and the implications they entail in the reading and meaning-making of narratives.

2.3 Readership

The communication continuum of narratives cannot be complete without the reader. A narrative presupposes two parties, “a sender and a receiver” (Chatman 1978, 28). This condition also applies to the museum: “what is a museum for if not for visitors?” (Bal 1996, 149-150). The visitor or audience of museums, the viewer or beholder of works of art, or the user of a digital project are equal in form and function to the notion of reader in the context of this research. The term, “lectoespectador” (Mora 2012)—translated from Spanish as readerspectator—becomes relevant in relation to this topic. According to Mora, the medial qualities of digital media enable processes beyond reading written words, including viewing, watching, and listening. The following paragraphs address the notions of reader, meaning-making, and reading in the context of museum narratives. Reader-response, a subfield of narratology, is the source for much of the theory here applied. It provides several terms and insights to better understand the status, role, and behaviours of the reader.

A reader is primarily conceived as a “decoder, decipherer, interpreter” of narratives (Prince 2013). As observed in the definition offered by the OED (2018) the term *reader* is related to the “written matter”, but an extended use of reader refers to “a person who studies, analyses, or interprets something, as though by reading”. The act of reading is not delimited by the medium of a text. A reader decodifies “signs” (OED 2018), and according to semiotics, signs can be verbal, visual, or aural. Taking this into account, a reader can read a written excerpt, a painting, an object, architecture, or a diagram. In the museum domain, the notion of reader is interchangeable with the those of audience or visitor when the narrative approach is adopted. This invites us to interpret audience and visitor studies under the lens of narratology. Narratology dissects the notion of reader into different types according to the function and nuances of the reader in narratives. The main ones are the real reader and the implied reader. The real or concrete reader (Prince 2003, 79) is the actual reader of a narrative. It should be also noted that the real readers “can read texts presupposing different audiences” (Prince 2003,

79). These readers might not be fully able to decipher the meanings intended by the author of the narrative, but nevertheless they read the narrative. They are “extrinsic and accidental to the narrative” (Chatman 1978, 150). The implied reader, a term coined by Iser (1978), is the hypothetical or presupposed reader of a narrative, the one who would fully understand it as assumed by the author of that narrative. A narrative is always shaped by the author with a reader in mind. Therefore the implied reader is immanent to any narrative (Chatman 1978, 150). Analogue notions to the one of implied reader have been proposed by other authors. The “model reader” foreseen by Eco is the individual “supposedly able to deal interpretatively with the expressions in the same way as the author deals generatively with them” (Eco 1979, 7).

The question to ask at this point is how a narrative text indicates who its implied reader is. Eco proposes three ways in which a text explicitly selects its reader “through the choice (i) of a specific linguistic code, (ii) of a certain literary style, and (iii) of specific specialization-indices” (Eco 1979, 7) such as scholarly jargon. Eco’s excerpt refers to a specific medium and form, a book, but it is worth extending these selective strategies to the digital realm. In this way, one can ponder the strategies and components that in online resources tell who their implied reader is. Are the texts, the interface, the use of images these components? Investigation should help to determine if some online resources have features better suited to some audiences than others.

As museums ponder ways to become more attractive to and inclusive of a variety of audiences, the notion of the implied reader is of relevance. After all “no text could possibly incorporate all the possible norms and values of all its possible readers” (Iser 1978, 152). Museum studies literature on narratives acknowledges the role of the implied reader idea in developing narratives. In museum exhibitions, “the dramatic tension constructed by the content and design team is based on an ‘implied visitor’ which has much in common with an ‘implied reader’ in literary theory” (Austin 2012, 116). Interestingly, literature that addresses digital storytelling in museums does not explicitly use narratological terms, such as *real reader* and *implied reader*, but systematic methods to outline the implied readers that would assist in the construction of narratives. These methods reveal an interchange between the two sides of the coin, real readers and implied readers. The implied reader is modeled upon real readers’ information. The recent CHESS project (Roussou et al. 2015) uses “personas”, a well-known method of user experience research, for that purpose. “Personas” could be defined as “empirically grounded, detailed descriptions of imaginary people (constructed user models) that are represented as specific individual human beings” (Roussou et al. 2015). The resulting personas were later implemented in the digital authoring system to generate narratives based in them. The term persona is not used by Pau (2017) when she describes the process designing the new San Francisco Museum of Modern Art app which delivers location-wise storytelling. However, the developing team studied the audience segment that could be more easily reachable through the app defining “key psychographic segments of Bay Area art-interested audiences

that are most likely to engage with the museum” (Pau 2017). These audience research methods however do not address the question of “who is the actual reader of the narrative?” and the potential mismatches between implied and real readers. Once the narrative has been generated, the readership of the narrative can be very different from the museum’s vision. Perhaps narratives become relevant to unexpected audiences or fail to reach the implied one.

Reading, the action performed by the reader, is defined as “to consider, interpret, discern [...] with understanding of what is meant by the letters or signs” (OED 2018). The definition of the reading act implies that the process of reading a text leads to an understanding of the meaning of a text. This definition indicates that meaning is fixed on the text and determined by the author’s input. The idea of the implied reader is founded on this principle. As Iser affirms: “although the reader must participate in the assembly of meaning by realizing the structure inherent in the text, it must not be forgotten that he stands outside the text” (Iser 1978,152). He further explains that “reading is an activity that is guided by the text; this must be processed by the reader, who is then, in turn, affected by what he has processed” (Iser 1978, 159). But other authors disagree. Barthes indeed defends that “the text’s unity lies not in its origin but in its destination” (1977, 148). This gives birth to the concept of the “death of the author”, which gives responsibility to the reader recognising their active role and rejecting passivity.

The concept of the “death of the author” and the empowerment of the reader are theoretical arguments related to the conception of interactivity in digital media. Marie-Laure Ryan distinguishes four levels of interactivity that she explains using the metaphor of an “interactive onion” (2011). The first level Ryan identifies is one where a reader interacts with elements of the display that unveil parts of the story “like reading a book with a magnifying glass” (2011). Interaction is reduced to the control of the display or the interface. The second type would be hypertextual interaction. In hypertexts, content is predetermined, but readers can change the order in which they read it. The third type is basically like a classic video game, in which the reader is the character of a story that follows a predetermined narrative. The fourth and final type is a more sophisticated version of the third type. Video games such as *The Sims* would fit this fourth type. The interactive onion model is brought up by Wong (2015) in order to explain how narrative interaction works outside the museological domain. Although Wong does not classify museums’ narratives according to Ryan’s model, the “interactive onion” is a valuable resource for narratological analysis and definition of museums’ narratives according to levels of interaction.

The emphasis on the reader can be also appreciated in the reader response theories that introduce the concept of “meaning-making” to the museum domain. Mason (2005) outlines semiotic and constructivist theories to describe how reader-response theory impacts on how meaning-making is regarded in museums. Semiotics is a theory developed by Ferdinand de

Saussure to study signs and how communication comes to fruition. Broadly explained, semiotics understand that signs (a word, an image, an icon, etc.) are composed by two parts a “signifier” and a “signified”, the first being the material form, and the second, a concept. The “signifier expresses the signified” (Barthes 1991,111), yet a signifier can have multiple signifieds and enclose several meanings, intended or unintended by the author. Readers construct the meaning of signs through the operation of reading or deciphering (Barthes 1991, 113). Semiotics is also the source of authors who investigate “how works of art are intelligible to those who view them, the processes by which viewers make sense of what they see” (Bal and Bryson 1991) or study museum spaces and the narrative meaning they carry (Austin 2012, 109-110). Mason (2005) however is particularly attentive to the constructivist approach that further revise semiotics. Constructivism “acknowledges that neither things in themselves nor the individual users of language can fix meaning in language. Things don’t mean: we construct meaning, using representational systems - concepts and signs. [...] it is not the material world which conveys meaning: it is the language system or whatever system we are using to represent our concepts” (Hall 1997, 25). Worth pointing out is that constructivism recognises the construction of meaning as social, but prior to further developing a discussion around it, the role of subjectivity in meaning-making needs attention.

Reader-response has produced several works that interrogate how the reader’s identity impacts reading (Prince 2013). Among those, Norman Holland’s work on literary response employs psychology and psychoanalysis to show that “readers respond to literature in terms of their own ‘lifestyle’ (or ‘character’ or ‘personality’ or ‘identity’)” (Holland 1975, 8). A reader responds individually to a work of art. Moreover, Bal and Bryson’s reflection on semiotics and art history make a similar affirmation to support the instability and variability the reader introduces in meaning-making: “Since readers and viewers bring to the images their own cultural baggage, there can be no such thing as a fixed, predetermined, or unified meaning” (Bal and Bryson 1991). These perspectives mirror several ideas museum studies literature on narratives presents, although museum studies texts neither acknowledge nor reference reader-response. Silverman recognises “the visitor’s active role in creating meaning of a museum experience through the context he/she brings, influenced by the factors of self-identity, companions, and leisure motivations” (Silverman 1995). Doering and Pekarik’s article (1996), provides a complementary reasoning. According to them, every visitor has formed their own “entrance narrative” before entering the museum. The entrance narrative can be defined as the knowledge and experiential background that influences how they interpret the discourses and narratives offered by the museum. In a similar fashion, Everett and Barrett (2009) investigate the way in which individual factors, that include personal interests and characteristic as well as home and educational background, shape the relationship a visitor has with the museum. This article helps to understand “the place museum visitation within the broader context of people’s lives” (Everett and Barrett 2009). When museums acknowledge that they can enrich the

connection with their audience through narratives, narratives may be used to “open up a space into which the [reader’s] own thoughts, feelings, and memories can flow and expand” (Bedford 2001) or to stimulate the audience to empathise with the actors of the stories (O’Neill 2007). Thus far, the literature provides the idea that the reader’s or visitor’s identity provides an affirmative meaning-making response, however a situation of disagreement might result as well. Doering and Pekarik suggest that the museum audience visits the museum expecting to obtain validation for their beliefs and prior knowledge. Visitors would seek intellectual approval. If they feel contested by the institution, their experience is not as positive.

Subjectivity and its connection to individualism are brought into question by reader-response. Stanley Fish’s concept of “interpretive communities” (1980) argues that meaning-making is also a product of social and cultural frameworks. Consequently, interpretive communities “are made up of those who share interpretive strategies” (Fish 1980, 14). Fish recognises that a text can be interpreted in multiple ways, yet the “ways of reading” would be “extensions of community perspectives” (Fish 1980,16). Fish’s work is a reference of Rhiannon Mason’s account on meaning-making in museums mentioned above (2005). The concept of interpretive community has been applied to the study of museum audiences (Hooper-Greenhill 2007, 76) in order to gain an in-depth understanding of how different segments of the museum audience are constituted around interpretation. According to Hooper-Greenhill’s understanding, this concept questions the museum authorship and presents a framework of analysis for audiences:

If exhibitions speak only to the interpretive community to which the curator belongs, then unless visitors share these interpretive frameworks, they will not feel comfortable. [...] In planning exhibitions and displays, the interpretive strategies and repertoires of the interpretive communities to which intended audiences belong should be anticipated (through audience research) and enabled. (Hooper-Greenhill 2007, 79)

However, research on meaning-making in museums rarely puts its focus on interpretive communities. One of the few examples of this approach is the report *Visitors’ Interpretive Strategies at Wolverhampton Art Gallery* (RCMG 2001). This report observes how exhibitions’ interpretive strategies align with the sociocultural profiles of museum visitors. Mason’s work (2005, 229) proposes to extend the concept of interpretive communities to different areas of museum audience research and identifies six following interpretive communities: communities defined by shared historical or cultural experiences, communities defined by their specialist knowledge, communities defined by demographic/socio-economic factors, communities defined by identities (national, regional, local, or relating to sexuality, disability, age and

gender), communities defined by their visiting practices, and communities defined by their exclusion from other communities. The “community defined by their specialist knowledge” is the most pertinent to the subject of this thesis; scholars are clearly defined as such because their specialist knowledge.

The literature exposes that scholars visit museums and online resources. Access to knowledge has intellectual implications: “the understanding and appreciation of objects assume a knowledge base typical from scholars” (Frost 2009, 239). Some audience studies (Graham 2005) identify a “special interest visitor” that can be recognised basically as a scholar. Their needs and influence “have far outweighed their numbers in terms of their impact on museum display” (2005, 28), and museums have a responsibility towards them. Graham recognises that this audience segment would particularly benefit from museums’ “electronic catalogues”. Online audience studies from major museums in the UK and US (Villaespesa et al. 2014; Romeo 2015) demonstrate the substantial percentages of users whose purposes for an online visit are research and study. However, these two studies identify audience segments based on the purposes on the visits and not on the identity of the audience. Therefore, one has to guess that “research” and “study” are the purposes scholars have. One of the rare examples studying scholarly audiences’ relation with art museums’ online resources is evidenced by a paper of the digital agency Frankly, Green + Webb (Mann 2016). The core aim of this study was the understanding of the reach and impact of two of the catalogues that constitute the Online Scholarly Catalogue Initiative. Unlike other art museums’ online resources, the catalogues created as part of this initiative are strongly oriented towards meeting the needs and expectations of scholars (Quigley et al. 2013). Their “implied readers” were scholars. Mann’s work delves into several issues that are relevant to this research: the study findings on “who uses the catalogues” speak about the idea of real and implied readers. While these catalogues have been created for scholars, the study show that the readership is more extensive than this segment. Moreover, the study, mirroring Villaespesa’s and Romeo’s work, also describes for what purposes catalogues are used. However, neither this study nor the others mentioned in this paragraph describe interpretive or meaning-making strategies used by scholars. And with the objective of fully embracing Fish’s interpretive community framework research should identify meaning-making and reading strategies.

There are several areas of narratology concerned with meaning-making and interpretation mechanisms. Along with reader response theories, “cognitive narratology” (Herman 2013a) throws insights on the cognitive processes involved in interpreting narratives. Herman (2013a) identifies “traces of cognitive narratology” in the reader-response domain. For instance, the work of Sternberg (1978) and Perry (1979) address processes actualising narratives. Both authors argue that the ordering and distribution of the different elements of a narrative determines how the reader would grasp its meaning. The elements of a narrative text (narrator,

characters, events, etc.) appear one after another; they “build up "cumulatively," through adjustments and readjustments” (Perry 1979), influencing the reading process. But, what are the strategies used to recognise those elements and construct a narrative? Herman suggests that readers employ analytical repertoires to comprehend narratives. Therefore, “engaging with stories entails using textual cues or affordances to negotiate the WHEN, WHAT, WHERE, WHO, HOW, and WHY dimensions” (Herman 2013b) of narratives. Herman builds a bridge between narratology and cognitive science theories which he eventually uses to address media-specific meaning-making, in particular relevant to texts that display visual and verbal dimensions (Herman 2013b, 103-143). Much has been discussed in the previous subsections of this literature about the predominance of non-linearity in digital media imposed by the hypertext. Cognitive theory is also the framework of reference used by Schneider (2005) to question the potential disorientation of the reader of narrative hypertexts as a consequence of non-linearity. His approach embraces the empirical component of cognitive sciences to prove the differences between reading in print and digital media.

The very act of reading, which entails meaning-making, has been analysed by the broader field of literary theory. Meaning-making cannot be actualised without reading. The “traditional” way of reading, close reading implies the “careful, intricate study of a text” (Mikics 2007, 61). Close reading is identified as a “reading strategy” when compared with other types of reading, such as scanning and skimming (Guillory 2008). What it is called a reading strategy in the context of this literature review is “a plan of action which provides a set of concepts and procedures by which to access and assess meanings entangled in texts” (Morris 2014, 420). The term, commonly used in educational contexts, becomes relevant in the context of new media theory (Morris 2014) that recognises the various reading strategies across media. Technophobes have seen “a shift from focused, sequential, text centered engagement to a far more lateral kind of encounter. [...] restless, grazing behaviour of clicking and scrolling” (Birkerts 1996, XIV). The stability, coherence, linearity, and slowness related to close reading are at risk in the digital medium (Morris 2014, 421; Schneider, 2005). Authors, however, do not necessarily identify the loss of these characteristics as negative. Katherine Hayles (2012) advocates for a reevaluation of reading strategies in the digital medium. On the one hand, certain reading strategies, which are often linked to the digital domain, have originated in non-digital environments. For instance, scanning, a strategy which constitutes “a form of attention” to organisedly find “keywords, names, dates, or other features of a text”; and skimming, the quick reading of a text (Guillory 2008), are reading strategies widely identified with Internet browsing and digital reading, even though scholars have been constantly employing them in research (Guillory 2008). On the other hand, Hayles recognises that genuine digital reading strategies, such as distant reading (Moretti 2013), enable meaning-making and interpretation in ways otherwise impossible. Subsequent literature adds up to the digital reading strategies mentioned so far. Sanz and Goicoechea (2012) identify a serendipitous

strategy which impels readers to make non-hierarchical associations between different elements of the text and different texts as they browse the Web. According to the authors, a competent reader of digital texts is one who "has found a balance between chaos and order, redundant and relevant information, ambiguity and determined meaning" (2012, 342). Worth stressing is that Hayles suggests that reading strategies coexist and complement each other. A reader can use close reading, scanning, and skimming to read a print book. A similar affirmation can be made with regards to the digital medium.

Literature shows the existing variety of meaning-making strategies in museums that reflect the complexity and intertextual quality of narratives. Taking into account that every museum's discipline is history, meaning-making strategies are adjusted to historical thinking. This discipline-bound meaning-making "requires an appreciation of similarity and difference, and of change and continuity over time; [...] an understanding of cause and motivation [...] and that events in history have multiple related causes" (Anderson, 1989). One can observe that this meaning-making process mirrors the principles of meaning-making reader-response theory and cognitive narratology arguments. Recalling Herman's "when, what, where, who, how and why" dimensions of a narrative (2013), a visitor would ask who created the objects, where and when were created, for what purpose were created, and how they were created. Studies on meaning-making in art museums confirm that when a visitor walks through the doors of a museum, visits an exhibition, and sees objects, uses meaning-making strategies including visual analysis and reading supporting information (RCMG 2001a, 2001b) to decipher the "socio-cultural context" and "processes of making" of artworks. If visitors construct the story of an artwork, it is because they read textual materials provided by the museum, including labels and panels, and perform visual and material analysis of the artwork. The RCMG's studies indicate that meaning-making not only leads to a historical understanding of the piece, the aesthetic qualities of an artwork, whether visitors like or how they feel about the colours of a painting, how space is represented, etc. are aspects to which visitors pay attention (2001a, 2001b). Additional strategies not linked to the historical discipline emerge from empirical studies on museums' meaning-making. Denominated as "narrative identification" (Leinhardt et al. 2002), this strategy would draw "the meaning or interpretation of an object out" into the visitor life, blurring "the lines between the objects in the exhibit and themselves" (Leinhardt et al. 2002). Similarly, du Toit and Dye (2008) state that museum visitors employ "empathic identification" to generate their own meaning-making narratives. Visitors would empathise with the museums' objects in a similar way they do with fictional narratives or drama, conceptualising the exhibition in terms of "character, plot, dialogue, and setting" (Toit and Dye 2008). Recent research continues to reinforce this thesis. As Schorch (2014) states "emotions and feelings are not separate stages of the museum experience but are continuously interwoven with intellectual and interpretive processes."

One of the principal qualities of the art museum is its spatial configuration which juxtaposes, orders, highlights, and recontextualises artworks in the gallery space. The study by Leinhardt et al. (2002) notes the role of the space and other unique characteristics of the museum in meaning-making processes which are not circumscribed to specific meaning-making strategies. After all, the reading of an artwork under the terms described above can happen in other circumstances—in a book, original location. Recent studies on meaning-making in museums have shifted the focus of their analysis to the role of space in actualising meaning. Architecture itself “conveys and embodies meaning” (Skolnick 2012, 86) and also other elements of the exhibition display—temporary walls, wall colour, vitrines, plinths, lightning, etc.—condition processes of meaning-making (Schorch 2013). As Schorch’s empirical research demonstrates: “Form and content exist and work in a mutually dependent relationship” (Schorch 2013). The logical next stage in this review is to explore the same concept in relation to digital media and question how digital media conditions meaning-making and what adopted strategies are similar to the ones emerging from the visits to physical galleries.

Meaning-making processes in the digital medium repeat the above strategies. In reference to narratives, digital or not, a widespread thought is that narratives “encourage people to connect to these artifacts on a deeper, more personal level, reaching an understanding that goes beyond the more traditional, intellectualized parameters established by museum professionals (historical, cultural, stylistic, and biographical)” (Springer and Borst Brazas 2004). In her analysis of museums’ web-based educational texts, Glover Frykman (2009) notices that meaning-making is constructed “by stimulating imagination, encouraging reflection, drawing on existing experience and knowledge.” This conclusion echoes the principles of “narrative” or “emphatic” identification authors have defined in relation to museums’ exhibitions. This shows neither progression nor change with respect to meaning-making strategies in galleries.

Nevertheless, museum studies literature on narratives offers insights specifically related to digital reading strategies which denote clear medium-specific differences. To an extent the literature here makes difficult to separate digital reading strategies, such as scanning, skipping, serendipitous reading, or distant reading, from meaning-making processes. The ability to construct the meaning of narratives in digital media is put into question by authors discussing digital narratives in museums websites and online resources. Wong (2015) points to the challenges imposed by the hypertext lack of linearity, “which can undermine the ability to make out a coherent narrative” and frustrate readers, because they would struggle to order events, characters, and other elements of the narrative if they are not arranged in a more linear manner. This “downside” of the hypertext is nevertheless celebrated by others. The non-hierarchical and decentralised nature of the hypertext privileges “allegorical and arbitrary associations, correspondences, and resonances” (Henning 2006, 315), which recall the cabinet of curiosity

model. According to other authors, the absence of linearity imposed by hypertexts can indeed engage the reader as he “gets to choose more frequently where he or she wants to proceed, renewing engagement with each decision point” (Samis and Svenonius 2015). Interestingly, Samis and Svenonius (2015) argue that long columns of text and long form essays in Websites fatigue readers, who scroll down pages without any choice except for how long they want to read. Skimming and scanning content would be a consequence of the linear, long, and monotonous presentation of a text on an online resource. As museums maintain an interest in long-form narratives, they seek solutions that would re-introduce readers to a slower and more linear reading of narratives (Birchall and Faherty 2016). However, if museums aim to present complex and potentially long narratives in more synthetic ways, another option available is the use of “visual rhetorical devices”—diagrams, graphs, timelines—that would “allow the viewer to see history ‘from a distance’, gaining an overview or perspective” (Davis et al. 2016) in similarity with distant reading.

This subsection highlights the agency of the reader in processing narratives and the different concepts that picture this active role of the reader in actualising narrative meaning. It shows how important it is to understand who is the reader of a narrative. The concept of implied reader is implicit in museums’ construction of narratives based on the readership they intend to reach, which may not be the real readership or audience the museum has. This invites to interrogate online resources upon the ideas of the implied and real readers. If online resources are effectively designed for the readership museums intend to reach is a question research should answer. Additionally, and in consonance with the debate the first section of this literature review opens on online resources typologies and audiences, the concepts of real and implied reader should help to further investigate if certain characteristics of online resources are better suited to certain audiences more than others.

The literature reveals that the role of subjectivity, readers’ backgrounds, in meaning-making can be explored through reader-response theory. Because this research focuses on a specific segment of the museum audience, the scholarly one, the notion of interpretive community frames its study. The studies that address how the scholarly audience uses museums’ websites and online resources provide a partial analysis of their behaviours focused mostly on the purposes for use of online resources instead of meaning-making and reading strategies. A definition of art museums’ online resources readership requires asking what meaning-making and reading strategies exist, or coexist, in online resources, and if they are the same narratology and literary theory offer or not. The definition should also interrogate whether specific types of media as well as spatial and temporal dimensions of online resources determine different strategies.

2.4 Conclusion

Summing up the contents of this chapter, the present conclusion exposes the problem that sets out the research. The first part of the literature review has revealed that online exhibitions and online publications share attributes and functions that trouble their identification as separate typologies. This calls for a clearer, more precise, and exhaustive definition of online resources and further interrogation of the two typologies. According to this problem, the primary research question of this doctoral research is, simply put:

How can online resources, namely online exhibitions, online publications, and similar resources, be accurately and systematically defined?

The literature has established that a common feature of these types of online resources is their narrativity. Online exhibitions, online publications, and analogue online interactives are narrative texts. According to this premise, section 2.2 of the literature review delved into narratology, the theory of narratives, and how it has been applied to the study of museums in order to pinpoint the attributes of narratives and identify gaps in literature that the research will fill. The section manifests that if narratives are defined in a certain way and have specific attributes, it is due to various factors. This leads us to question not only what online resources are and what narrative attributes define them but also why they are the way they are.

Subsection 2.2.1 introduced concepts that apply to the study of the museum as narrative text. Museums are texts which contain other texts, like exhibitions and publications, establishing an intertextual relation between them. Moreover, texts are formed by the main text and paratexts that frame and present the text. Accordingly, the narrative definition of online resources should treat them as texts that hold an intertextual relationship with the museum and are composed by paratextual elements. The following subsections, 2.2.2 and 2.2.3, outlined the structural principles of narratology and the historical nature of museums narratives; these principles establish the basis that organise the remaining subsections. The subsection on authorship puts the focus on the collective and collaborative nature of authorship in museums, inviting to further examine how it is configured in online resources, from the arrangement of departments to how digital skills reshape authorship. It also invites to inquiry the factors that determine authorship and asks whether or not online resources preserve the authoritative institutional representations of the museum that the literature has criticised extensively.

The subsection dedicated to study mediality calls for more research on the relationship between the verbal and the visual. Questioning what medium prevails in online resources also responds to the necessity of interrogating typologies, the exhibition and the publication. Temporality and spatiality of narratives are reviewed in the corresponding subsection

indicating several aspects that need additional research. This subsection concludes that research should determine the temporal characterisation of online resources in general and ultimately interrogate whether typologies are defined by temporality or not. The subsection makes a case for more extensive research of the spatial attributes of online resources, asking if online resources are well defined spatial types. The literature argues that online resources may be linear and nonlinear, yet it does not clearly state the implications of each modality, and more research is required. The last subsection addresses readership, highlighting the role of the reader in actualising the meaning of narratives. An investigation of the readership of online resources asks for research on the correspondence or lack thereof between intended readership and real reader. The literature introduces the concept of interpretive community and argues its suitability to examine scholars and their relationship with online resources.

Chapter 3

Research design and methods

3.1 Introduction

The theoretical foundation to answer the research question is narratology. Various interrelated methods to collect and analyse research data were combined in order to complement and support narratology. The methods, originating in social science research, reflect the multifaceted approach needed to study art museums' online resources from an empirical perspective. This perspective includes the voices of both museum practitioners and a specialised audience, the individuals involved in online resource creation and reception—or according to narratology, authorship and readership.

The present chapter introduces the use of specific narratological subdomains and their supporting empirical methods, which are embedded in the methodology. This chapter also points out the impact of the thesis author's professional practice on this research. Additionally, the chapter describes the different research stages undertaken as a part of this thesis:

- The careful selection of exemplary case studies representing art museums' online resources common practices. Six online resources were finally chosen after completing a comprehensive survey of art museums' online resources, which helped recognise commonalities and differences.
- Data collection methodologies were designed in order to proceed with the collection of data from museum practitioners, the authors, and a scholarly readership.
- The process of coding the collected data in order to construct the definition of online resources as narratives.

3.2 Choice of methods

3.2 Narratology and empirical research

This subsection outlines the principles of the research methodology. These principles serve as the introduction to the following subsections that discuss in detail the way data was collected and analysed for this research. Conceiving art museums' online resources as narratives and defining them as such introduces certain methodological implications. On the one hand, the selection of narratology as the theory in which the methodology is based is obvious, but on the other hand, it is only with great effort that it can be applied to empirical museum studies research. I argue for an implementation of qualitative and empirical methods aligned with disciplinary principles of museum studies. Complementing narratology with these methods enables the study of online resources as narratives in an extensive manner. Not only is the narrative of the online resource dissected and analysed according to narratology, but the empirical evidence from the author/museum, and the reader/audience of the narrative is also closely considered.

Museum studies is an academic field that, while rooted in practice, seeks to overcome the separation between academic theory and professional practice. As noted by Sharon Macdonald in the introduction to a recent companion of museum studies, the expansion of museum studies sought “to bring together the insights from academic studies with the practical work of museums” (Macdonald 2011, 6). This separation between academy and profession is in noticeable the narrative or “museum-as-text” approaches museum studies has used (Mason 2006,96). Macdonald has criticised that “agendas involved in exhibition-making, the ‘messiness’ of the process itself” is ignored when museums are addressed as narratives (1996, 5). The object of analysis becomes the finished text—for example, the museum display or the exhibition—without taking into account authorial viewpoint. This implies that only one facet of an online resource is encountered by the researcher: the online resource itself.

Although Macdonald affirms that the “interpretive agency of visitors” (1996, 5) is absent from narrative accounts on museums, the literature review shows that research exists in this area. While it is true that narrative analysis of museums never renders an exhaustive picture of narratives that reflects both professional practice and the audience perceptions, examples of museum studies research that examine the two agents are found in recent academic practice. A case of the way academic insights are combined with professional practice and audience perception is illustrated by *post-critical museology* (Dewdney et al. 2013). The book, which coined the museological term *post-critical museology*, reflects on the study of the Tate from post-colonial and post-structural theories by means of practitioner and audience studies. Researchers employed several methods, among which grounded theory is included, in order to support the

generation of “emancipatory knowledge” from the institution and the audience (Dewdney et al. 2013, 78-79). Considering that the theory that guides this research is narratology, data collection and analysis methods such as grounded theory (Glaser and Strauss 1967, 6), which develops a theory based on empirical data, cannot be utilised.

With the objective of overcoming the weaknesses of narrative accounts on museums, attention is turned to methodological approaches to narratives that fill the existing empirical gaps. These methodological procedures are illustrated by what is denominated as either narrative research (Andrews et al. 2008)—the term used in this chapter—or narrative enquiry or analysis (Riessman 1993; Polkinghorne 1995). This qualitative framework is widely employed in social sciences. It is focused on gaining insights from personal narratives, biographies, socially and individually oriented history, from both the perspectives of the teller and the listeners—authors and readers. In the way the method is configured, it involves collection of the narratives, commonly in interview form, which is then transcribed at a later stage, as well as the use of coding that identifies themes or narrative elements (Riessman 1993, 2002). Very often narrative research is concerned with “what” is told, for instance, stories and themes. This type of analysis and coding is the one Riessman (2005; 2008, 53-76) calls “thematic analysis”. However, Riessman identifies another kind of narrative research analysis centred on knowing “how” stories are told. Labelled as “structural analysis”, it shifts “attention from the ‘told’ to the ‘telling’” (Riessman 2008, 77). Performing the type of analysis and coding necessary for the structural model requires a focus on different elements of the narrative, such as sequences, characters, time, space, etc. (in short, the attributes narratology theorises). Subsequent approaches to narrative research emphasise the role that “literary elements” tied to narratology and literary studies play in the analysis and codification of data (Coulter and Lee Smith 2009)—although these authors do not identify their work as structural analysis.

Narrative research, and in particular structural analysis, provides the base model for the integration of empirical data from the museum as the author and its audience as the reader of online resources. The following sections describe the practicalities of implementing narrative research, from the choice of data collection methods—interviews in the case of museum professionals, and think-aloud protocol in the case of scholarly audience—to the coding of transcribed data.

3.2 Reflective practice

While the central theoretical and methodological node of this research is narratology, the professional experience of the author of this thesis in art museums plays an important role. This research cannot be considered an example of practice-based research (Murphy 2018), since it

is neither performed within a museum nor leads professional practice, but professional practice has shaped the research in other ways. The author's experience as fellow at the Publishing Office at the National Gallery of Art in Washington, D.C., where she worked with scholarly online publications, framed to a large extent the research question and the interpretation of some of the responses of museum professionals. The doctoral internship at The Fruitmarket Gallery, completed prior to the data collection phase, provided the opportunity to test out data collection procedures relative to the audience element. This thesis subscribes to reflective practice as a means to integrate learning and reflections from practice in the research.

Reflective practice, a model of thought about professional knowledge introduced by Schön (1983), gives a framework from which professional practice is regarded. By integrating reflective practice in the different methodological stages of this research, not only Schön's work but also applications of it to museum studies were taken into consideration. Teather (1991) points to the disjoint between theory and practice in museum studies academic programs and proposes a "framework" in which museums' "attributes are to be translated into the skills and knowledge of the responsible practitioner" (Teather 1991, 414-415). Teather's use of reflective practice is concerned with a general conception of museum studies and converses with previously mentioned authors (Macdonald 2011), yet it does not provide detailed accounts of reflective practice performed by museum practitioners. Woodruff (2018) instead provides a reflection of his experience as an intern in a museum's education department, which he compares to his prior teaching experience in schools and theory learnt during his studies. His internship experience consisted "of several roadblocks, high points, confusions, and comparisons" from which he learns and makes conclusions that inform his practice and the production of the article. Although Woodruff's study reflection leads to a conclusion, in this thesis reflection and lessons learnt during the fellowship at the National Gallery of Art formed assumptions and hypotheses prior to research and helped shape the questions from which research originates. Reflective practice sets the basis for research along with the understanding of online resources as narratives. As Schön states, there are a variety of phenomena a professional reflects in and on during practice:

He may reflect on the tacit norms and appreciations which underlie a judgment, or on the strategies and theories implicit in a pattern of behavior. He may reflect on the feeling for a situation which has led him to adopt a particular course of action, on the way in which he has framed the problem he is trying to solve, or on the role he has constructed for himself within a larger institutional context. (Schön 1983, 62)

Similar to Schön's observations, during the course of the fellowship and after its completion, the author of this thesis observed her own work as well as that of her fellow practitioners. In

so doing she also interrogated principles, the conceptual and institutional frameworks defining online resources, and compared pertinent online resources to those from other institutions.

Moreover, to an extent, reflective practice originated during her work with digital publications at the National Gallery of Art informs the considerations about authorship in the museum in conjunction with narratology. Reflection in and on practice is ingrained in part of the data analysis and conclusions deriving from responses and assertions of museum professionals. In this way, the application of reflective practice is similar to Woodruff's approach. In particular, the thesis' author knowledge of museum work helps to interpret the factors that determine the authorship of online resources and pinpoint the implications of the definition of authorship.

As mentioned above, reflection from practice at The Fruitmarket Gallery is also embedded in the design of the data collection methodology used with the scholarly audience. Further details on this matter are given in a subsequent section of this research.

3.3 Surveying and selecting online resources for in-depth-study

Defining art museums' online resources implies the exploration of similarities and differences, boundaries and overlaps between online resources. As explained by the Oxford English Dictionary, a definition is "a precise statement of the essential nature of a thing; a statement or form of words by which anything is defined". When the entity to be defined presents in practice several variations, an analysis of these variations is a necessary step to finally complete a description of this entity. On the one hand, a single case study and an in-depth analysis of it to construct a definition of an entity imposes some limitations, since the resulting definition would not cover all the possible attributes of such an entity. On the other hand, limiting the definition to a survey of online resource would only provide a description based upon surface-level insights.

When identifying models for the survey and selecting online resources for research, narrative research provides no guidance at all. Other qualitative research methods are more explicit in the description of their procedural details. According to this, the method chosen to select online resources responds to the model of comparative studies or comparative analysis. The notion of comparative analysis is reported by Glaser and Strauss in their foundational text on grounded theory:

Comparisons [...] help us broaden the theory so that it is more generally applicable

and has greater explanatory and predictive power. By comparing where the facts are similar or different, we can generate properties of categories that increase the categories' generality and explanatory power. (Glaser and Strauss 1967, 24)

Indeed, by comparing online resources, we can provide a definition of their characteristics that is applicable to a great number of them. As disclosed by Flick, "in comparative studies, [...] the case is not observed in its totality and complexity, but rather a multiplicity of cases with regards to particular excerpt" (2010, 147). In this case, the "particular excerpts" are the narrative attributes of online resources.

The exercise of completing a comprehensive survey of art museums' online resources worldwide served as a means to confirm objective choices identified during the initial phase of the research, guarantee their suitability for further research, as well as identify new online resources. In order to construct the survey of online resources, websites from major museums worldwide and awards (Webby Awards and the Best of the Web Award from the Museums and the Web annual conferences) were systematically consulted. Subsequently, the survey of online resources was posted on the author's personal website, <http://m-hidalgo.com>, and the Museum Computer Group email list, so that museum practitioners could contribute to the list of online resources. Overall, this strategy helped to ensure that the list was as comprehensive as it could be. The survey was published on an open Google docs spreadsheet that could be freely edited, resulting in a good number of entries being added.

Some of the online resources provided by members of the mailing list were not applicable to the research focus, e.g., online exhibitions and publications from science, ethnography, or history museums. Some other examples did not fully correspond to the typologies represented, for instance, a 360-degree view of the exterior of the museum building, or a digitised catalogue in pdf format. Although these last examples do not fully fit into the resources explored in the research, they contribute to the debate of what does and does not constitute an online exhibition and an online publication and also inflect users' conceptions of those media. Additionally, publicising the survey allowed the promotion of research among a broader community. In this regard, it is important to mention that the page on the website in which the list was published recorded seventy-two visits on the day of publication on the Museum Computer Group mailing list.

A total number of 130 online resources created between 2006 and 2017 are compiled on Appendix A. Besides the name of the resource, the url, the institution, and country, the survey lists the following typologies:

- digital publications

- scholarly publications
- exhibition websites
- online exhibitions
- interactive features

However, institutions do not always assign a typology. Therefore, in order to avoid ambiguity, when a typology is not given by the museum, online resources are listed as interactive features. The survey, according to the narratological concepts, explored in the literature review identifies the variable attributes of online resources. With regards to authorship, the survey observes if there is a known author, such as a curator, or if it is anonymous, and whether the voice used is first, second, or third. The survey also identifies the media used by the resource, if it features images, text, video, audio, and diagrams. Regarding spatiality and temporality, the survey notes: the space the interface of the resource represents (if it is three-dimensional or two-dimensional) and the scope of the resource (if a resource is placed in an independent microsite or embedded in the museum website); the temporal dimension of the resource, whether permanent, temporal, or episodic; and if the resource is linear or nonlinear. Lastly, the survey differentiates between an implied readership of scholars or a general audience. This last narrative attribute is sometimes highlighted by the museum, but it is generally guessed by the author of the research, who roughly marks online resources as scholarly when these are scholarly publications, and general-audience-oriented in the other cases.

When choosing the six online resources for further research, the aim was to offer a balanced selection of resources that exemplify recognised and most popular practices in the field, as well as unusual and cutting-edge unique features. The findings derived from the completion of the survey, which are described in the results chapter of this research, framed the selection of online resources. Yet, professional networks also determined the selection of the online resources, as did travel funding availability and linguistic abilities. The funding provided by the University of Glasgow Principal's Early Career mobility scheme made it possible to travel to New York City to interview in person museum professionals involved in the development of the selected online resources.

3.4 Recruiting, interviewing, and collecting data from museums professionals

The authorial perspective of the museum professionals involved in the creation of the six online resources selected was obtained through semi-structured interviews. Interviewees held high-level positions in their museum's hierarchy at the time of the interview, except for one case in which the interviewee was not part of that institution anymore. Worth mentioning are the strategies used to recruit candidates for interviews. In a couple of cases, a professional connection between the researcher and interviewees existed prior to research. This made it easy to contact them and request a meeting for the interview. With the remaining case studies, the process was more complex. Some issues have been described in the literature on "expert interviews" (Flick 2010, 166-168); these include difficulties in identifying the right experts and convincing them to give an interview. Persistence and creativity was required to overcome these difficulties. For two of the case studies, the snowball method (Lewis-Beck et al. 2004) was used. Museum professionals were contacted through Twitter and listservs. Their responses were positive and the contact details of their colleagues were furnished. Web forms to contact the institution were used on three occasions. Through the form, the institution was asked about the person responsible for the pertinent online resource and the purpose of the interview was explained. Institutions easily provided the contact information of the relevant persons, and they referred us to the right professional. These steps, however, secured only two interviews. An additional online resource was initially selected, but, after having a conversation with the potential interviewee, participation in the study was declined. During the interviewee recruitment process, the interview questions were made available in advance to candidates. This not only guaranteed their agreement with the interview contents, which required consent for data collection in accordance with the University of Glasgow regulations, but also helped some participants to prepare their responses in advance.

The willingness to participate in the research and interview was in part supported by my affiliation with academic institutions as Ph.D. candidate at the University of Glasgow and Visiting Scholar at the Media Center for Art History at Columbia University in New York City. Prior to and during the interviews, participants were informed about other art museums participating in the research and the general scope of the project. Interviewees were keen to know the time frame for completion of the research and the affiliations of other professionals participating in the same study. Consent forms (approved by the University of Glasgow School of Arts Ethics Committee) were also provided as a means to ensure that permissions for appropriate use of the data and identification of participants had been provided.

In order to elaborate the interview questions, narratological concepts exposed in the literature

review relative to authorship matters and professional experiences and reflections were taken into consideration. The interviews provided information about online resources that portray aspects of the process, institutional frameworks, decisions made, and conceptions existing before, during, and after the creation of the resources. Given the narratological approach of this research it is necessary to mention that the interviews were not conceived as narrative interviews, which would elicit narratives of topically relevant stories (Flick 2010, 180). So the aim was not to construct stories of the creation of the online resource but instead to obtain a description of online resources and the principles that guided their conception.

The formulated questions cover broad themes to allow comparison between case studies. Additionally, the broad formulation of the questions helps to formulate a definition of online resources as generally as possible. A semi-structured interview model was chosen over structured and unstructured ones. This allowed us to have “more control over the topics of the interview than in unstructured interviews” and to avoid the “fixed range of responses to each question” common to structured interviews (Ayres 2008). Moreover, in forming questions, the language used avoids narratological jargon. Prior professional insider knowledge of the thesis author demonstrates that while museum practitioners produce narratives in online resources, their knowledge of narratology is not extensive.

According to these principles the interview questions were:

- From your point of view, how does this online exhibition/online publication/interactive feature take advantage of the digital medium to tell art history differently?
- What characteristics of the digital are the most and least beneficial for art museums to tell art history online?
- Where did the team look for inspiration and ideas in order to develop this online exhibition/online publication/interactive feature? (e.g. other media, other museums, etc.)
- What departments and what kind of professionals are involved within the production of this online exhibition/online publication/interactive feature?
- What are the main challenges the museum face during and after the development of a highly curated multimedia exhibition or publication?
- To what extent are curators engaged in the production process? What is their role? Should curators acquire more digital skills?
- What do you think are the main differences between an online publication and an exhibition?

- What should be the next developments of online exhibitions/online publications/interactive features in art museums?

Ultimately, six interviews with seven museum professionals relative to the selected online resources were completed between June 2016 and December 2016. All interviews presented the same set of questions, with a minor grade of customisation pertinent to each case study according to the semi-structured interview model. There was a certain level of flexibility in the order in which the questions were made. Interviewees had the printed questions in front of them during the interview for reference and sometimes they jumped from question to question when they felt it was necessary. Some interviewees anticipated and answered later questions in their responses to earlier ones. The question relative to whether an online resource is an online publication or an exhibition needed more clarification than the others. Further explanation about the scope of the research was needed in order to clarify the purpose of the question.

Generally, in-person interviews were held in familiar locations to interviewees, such as their museum offices. Obtaining the University of Glasgow Principal's early career funding for a research stay at the Media Center for Art History at Columbia University during June and July 2016 greatly facilitated the recruiting and interviewing arrangements. However, in a couple of occasions, interviews were conducted remotely via Skype when logistical arrangements for face-to-face could not be made. An audio recorder installed in a smartphone was used to store the audio during the conversation and facilitate data transcription and analysis at a later stage.

3.5 Using think-aloud protocol to research meaning-making and reading strategies

The design of the data collection method to be described in this subsection is based on the premise that art history scholars are “readers” of art museums’ online resources. Obtaining behavioural data from scholars reveals their interactions with the narratological elements in online resources that this research aims to define.

It is necessary to stress that the doctoral internship at The Fruitmarket Gallery in Edinburgh provided an excellent opportunity to test a simpler method (a questionnaire) and examine its effectiveness. Implementing think-aloud protocol was partially a result of this particular experience. While the data provided by the questionnaire was extremely valuable—and sufficient for the purposes of the internship—it did not provide enough details on scholars’ reading behaviours. Hence, according to the purpose of this doctoral research, a method that provides further insights was required.

The choice of the data collection method (think-aloud protocol) stemmed from the researcher's understanding of the connection between web usability and user experience (UX) and online reading. The literature about think-aloud protocol this section reviews demonstrates the overlap between these different domains of study. Think-aloud protocol is used in investigations concerned with textual- and multimedia-centred reading behaviour, web usability studies and human computer interaction theory related to reading behaviours, and, lastly, museum visitor and user studies. For this reason, it is necessary to explain extensively the ways in which all domains are interconnected.

Fludernik (2005, 48) notices a “cognitivist turn” in current narratology studies, a turn which for other authors translates into “cognitive narratology”. In his recent explication of cognitive narratology, Herman (2013) describes it as a “subdomain” of narratology that supplements it with methods from other domains, such as linguistics, computer science, or psychology, to study “cognitive processes vis-à-vis various dimensions of narrative structure”. This broad conception of cognitive narratology matches the purposes of the data collection. Herman's “explication” in the *Living Handbook of Narratology* mentions the existence of empirical and digital media oriented studies within the subdomain. And both Fludernik (2005) and Herman (2013) point to the empirical work that Bortolussi and Dixon describe as *psychonarratology* (2003). This is the “term for the investigation of mental processes and representations corresponding to the textual features and structures of narrative” (Bortolussi and Dixon 2003, 24). This description converses with the definition of “cognitive narratology”. If Bortolussi and Dixon's work is deemed relevant to us, it is because of the data collection methods it describes. Eye movement tracking, reading-time measurement, and questionnaires are used to obtain empirical evidence of cognitive processes in their experiments. Verbal protocol, a name by which think-aloud protocol is also introduced (Ericsson et al. 1993), is employed in their experiments too.

There is a clear connection between cognitive narratology and studies dedicated to reading behaviours and strategies. In pedagogical and instructional contexts, research is also concerned with reading cognitive processes in young learners. Through think-aloud protocol, researchers usually obtain “bridging inferences, elaborative inferences, associations, and paraphrases” pertaining to the text they ask participants to read (Carlson et al. 2014, 44). Studies employing think-aloud protocol to examine reading behaviours address comprehension levels of literary and expository texts (McMaster et al. 2012; Carlson et al. 2014). Additional articles published after the completion of the data collection in this thesis continue to employ think-aloud protocol (Karlsson et al. 2018; Kraal et al. 2017; Seipel et al. 2017). Think-aloud protocol alone is the preferred method in all these investigations, although it can be combined with eye tracking (Rapp et al. 2007) to counteract each other's limitations.

Think-aloud protocol is once again a trusted method used to investigate comprehension of online texts (Anmarkrud et al. 2013; Cho 2014) and strategies for online reading (Coiro 2011; White 2016). One of these studies is interested in the interplay between “multimedia elements” and the written text, as well as in parallax linear websites (White 2016)—namely, the New York Times’ “Snow Fall: The Avalanche of Tunnel Creek” (Branch 2012)—and interrogates the way in which reading is affected on websites with those features. Interestingly, White’s study shows parallels with some museum studies texts (Grant 2014; Samis and Svenonius 2015; Birchall and Faherty 2016). Other studies interrogate reading across multiple texts or web pages (Anmarkrud et al. 2013; Cho 2014). A common characteristic of all four studies is that they focus on informative texts rather than on literary ones. However, think-aloud protocol is also applied to the study of literary narrative digital texts.

The work of Pope (2010), circumscribed in the domain of literary theory, uses think-aloud protocol with the purpose of obtaining readers’ responses to interactive fiction narrative structures and interface design. Pope’s methodology draws from “reader-response literature” and “usability studies in Human–Computer Interface (HCI) design”. His methodological choice is based on the idea of hyper-fiction readers as both readers and “users”. His argument for utilizing think-aloud protocol is grounded on usability and HCI literature. According to him, think-aloud protocol “provides the most complete and detailed data for analysing human–computer interface interactions” (Pope 2010). The connection between reading behaviours, web usability, and HCI is not always as explicit as Pope suggests, and a similar methodological scope is not often seen in literature. Prior to Pope, Gee (2001) pointed to the relevance of web usability in the evaluation and redesign of “hypertextual narratives”. This leads to the consideration of the implications of web usability, user experience, and HCI sources in the choice of the think-aloud protocol as a data-collection method.

Extensive instructions on think-aloud protocol in the context of web usability and user experience (UX) can be found on commercial (for example, the Norman and Nielsen Group website [Nielsen 2012]) and institutional (such as the United States Government site usability.gov [Romano Bergstrom 2013]) websites. It is necessary to note the overlap that exists between HCI, a subject with strong academic foundations, and UX, which has been widely adopted in industry. Reeves (2014) remarks that “research in both academia and industry often seem [sic] to deal with fundamentally similar objects: the understanding and design of interactive digital systems and their human users” and makes a call to establish a connection between academia and industry. Moreover, usability and UX practice is embedded in the daily practice of museums, and the use of think-aloud protocol to evaluate usability is being taught by practitioners in professional workshops (Treptow and Kaiser 2015) and described in art-historical institutions’ blog posts (Lee and Edwards 2015).

In short, think-aloud protocol is presented as a robust data collection method widely used in a variety of disciplines relevant to this research: cognitive narratology, reading behaviours, digital literature, user experience and human computer interaction, and museography. Like cognitive narratology, this research is interested in the cognitive processes' corresponding features and structures of online resources' narratives. Like reading behaviour research, this research looks at preferences, choices, interpretations, associations, and meaning constructions. Lastly, this research shares a common concern about the interplay between narrative, multimedia, and interface, with researchers investigating reading behaviours in digital environments and digital literature. It is noticeable that the concept of reader is at stake in the investigations here cited. In similarity with this research, other authors conceive of the digital-media reader not only as a reader of written texts but also as a "user". This implies that the study of reader behaviour needs to be expanded towards interaction with other media and the interface itself and not only with written text.

The recruitment of scholars for participation in the readership data collection section of the research was slightly different compared to the process followed with museum professionals. It sought to include twenty art history scholars at different stages of their careers who were either technologically literate or not. The participant scholars sample can also be divided into three groups according to their location: one group of scholars based in New York City, a second group of art historians based in Glasgow, and a third group of scholars based in other locations, such as other cities in the United Kingdom, the United States, and Europe.

The working experience at The Fruitmarket Gallery in Edinburgh from January to May 2016 as part of the doctoral internship funded by the Scottish Graduate School for Art and Humanities was key to developing a successful recruiting strategy based on the lessons learnt during the internship. The main purpose of this internship was to understand the usage of online resources by art historians and general audiences in order to inform the digitisation of the gallery's archive. The study developed with this purpose employed an online questionnaire. More responses were received when contact with participants was done through direct emailing rather than through snowball or chain sampling strategies. Due to this reason, in this doctoral research the direct emailing tactic was employed along with a call for participants posted through the researcher's personal website and listserv email lists.

The recruiting strategies used with each group differ in certain aspects but also share some particularities. The success recruiting participants active in New York City was due to the assistance provided by the different members of the Media Center for Art History at Columbia University. They provided assistance to identify the right faculty members to contact and facilitated the introduction to members of the New York City Digital Humanities Group NYCDH. The recruiting strategy followed with scholars active at the University of Glasgow was sub-

stantially more simple. Personalised emails were sent to researchers, lecturers, and doctoral students based at the University of Glasgow. At the same time, the third group of participants were contacted in different ways: firstly posting a call for participants on the personal website of the thesis author, and subsequently on the following mailing lists: ART-VISUAL Digest, Computer Arts Society, and Digital Arts Forum. Additionally, professional and personal contacts of the researcher active in digital humanities research were contacted as their unique backgrounds could potentially bring a wider variety of insights into the study.

Despite the initial aim to include both technologically literate and non-technologically literate scholars, a substantial majority of participants were digital media enthusiasts or even digital art history practitioners. "During research obstacles become important because they are often of a systematic nature", Merckens (2004, 166) points out. Therefore, succeeding in recruiting more technologically literate scholars than non-technologically literate ones in this research cannot be considered as a limitation of the study but rather as a reflection of the recognition of digital technologies among art history scholars. For instance, one of the individuals contacted declined the invitation because of their scarce familiarity with digital media. The recruitment process is also a reflection of a possible generational shift towards the acceptance of digital technologies in the discipline. In general terms, while younger participants who agreed to be part of the study did not have a strong background or specific experience working as digital art history practitioners, more experienced participants often specialised in digital humanities or digital art history.

In order to obtain the required data for the research, three different procedures were implemented into the think-aloud protocol sessions. According to descriptions of the methodology, additional procedures, such as questionnaires (Pope 2010), and varieties of the method, such as retrospective verbal reports or questioning (Hevey 2010), were utilised to overcome limitations of the protocol itself. While being fully aware that think-aloud is not a natural behaviour and cannot reveal all processes in participants' minds (Hevey 2010), think-aloud is still a robust method for qualitative data collection.

Firstly, three brief profiling questions were asked to participant scholars regarding the usage of online resources, print and physical objects, and the participants' familiarity with digital scholarship:

- Do you use digital exhibitions or publications for professional or study purposes (research, teaching, exhibition planning, collections management purposes, and/or public outreach)?
- Do you visit physical exhibitions and/or use printed exhibition catalogues for the same purposes?

- What is your familiarity with digital scholarship, resources, methods, etc.?

These questions facilitate the analysis of utterances as related with the backgrounds of scholars and the constitution of the interpretive community that scholars belong to.

Subsequently, think-aloud sessions were led. Each participant scholar was provided with two online resources from the six selected. The online resources used are both the object of inquiry and stimulus for the participant to yield behavioural data. The online resources content was as close as possible to their area of specialisation. The first online resource used by participants during the session was less textual and more visual and aimed towards a general audience, whereas the second online resource was substantially more textual and had a more scholarly scope. Each online resource was planned to be used between five and seven times, taking into account that the minimum number required to complete a usability testing study is considered to be five (Nielsen 1993, 169; Nielsen 2012). Accordingly, the data retrieved after that number of sessions was consistent enough to consider that the study had reached saturation. It is also necessary to remark that the pairings of online resources were not consistent in each session, because, as said, the overall intention was to provide a website with content suitable to each participant. Participants were asked to navigate the website as they would do for professional purposes, such as performing research and teaching preparation. They were also asked to verbalise their thoughts and indicate what they liked or did not like in the website, what confused them, specific parts of the website they were paying attention to, and the reasons to click on one link over another and visit certain sections of the website.

The triangulation of the method was guaranteed with a set of immediate retrospective questions. Retrospective questioning (Hevey 2010) is used to clarify and expand on ideas related to the purpose of the study that might or might not come up during think-aloud sessions. It is demonstrated that retrospective questioning is more reliable just immediately after the think-aloud session (Charters 2003). The questions used during the research process were the following:

- What do you think is the best feature of this online exhibition/publication?
- Do you think they are narrating/telling a story in a way that would not be possible with a physical exhibition or printed publication? Why?
- Do you have a different perception of the subject after the visit? Why?
- Do you consider this website as an exhibition or a publication? Why?
- Would you like to see other functionalities that would help to tell art history more effectively online in art museums' online exhibitions or publications?

- What do you think are the main barriers for using digital exhibitions and publications in art history?

A total of twenty individuals took part in the study from June 2016 to early February 2017 in New York City and Glasgow, although some of the think-aloud sessions—eight of them—were held via Skype or Google Hangouts. Sessions were held either in the participants' offices or at the university's facilities for doctoral study; the sessions were audio recorded and notes were taken when necessary. Even though video or screen recording during the navigation of on-line resources was considered, technical limitations of the researcher's personal computer ultimately obviated this choice. We relied on audio recordings and annotations instead. Particular attention was given to making participants feel comfortable, to not extend the duration of the sessions longer than necessary, and to make clear that no previous preparation was needed to participate, as their speech was meant to be as spontaneous as possible. Sessions would last for a minimum of thirty minutes and a maximum of one hour, even though, depending on the participant circumstances, they would last slightly longer. Interestingly, some participants were particularly keen to share their personal experiences working with digital projects if those were related to the websites they were using during the sessions. The use of Skype and Google Hangouts was not detrimental to the data collection process, despite the risk of disconnection; capabilities such as screen sharing were particularly useful in terms of attention focus. Screen sharing is a functionality particularly well suited for procedures such as the ones described here, since it facilitates the focus on the participants' actions.

During the completion of the study, some adjustments needed to be made. For example, on four occasions, a website from an institution not included as a selected online resource was provided, as scholars participating were specialists in British Art and none of the six online resources researched covered this art historical area. This website was substantially similar in terms of structure and functionalities to one of the six online resources selected, the National Gallery of Art's Online Editions, yet the data analysis in these cases required an extra task comparing both online resources before reaching conclusions. With regards to the think-aloud sessions, prompting questions and indications were given to participants in order to obtain reflections regarding particular aspects and functionalities in the websites that were overlooked. This practice has an impact on the spontaneity of the answers, since it leads the participant and distorts the think-aloud process, although it was necessary when the complexity of the given website would prevent the participant from finding content, triggering functionalities, or just understanding the scope of the online resource. Further conclusions regarding these situations during the sessions are covered more in detail in the results chapters. The formulation and ordering of the retrospective questions were consistent in all the interviews, although some clarification was needed with regards to the last three questions; therefore the scope of the research and research objectives had to be explained.

3.6 Transcribing recorded data

Conceived as an intermediate step between the collection of data and its analysis, transcription of the recorded audio is also considered as an interpretive process in itself (Riessman 2002). It enables a second but full immersion in the recordings to capture subtle details and points that might have been missed during the interviews and think-aloud sessions, facilitating the next stage of the data analysis. Both interviews with museum professionals and think-aloud sessions with scholars have been transcribed manually using the online open source tool available at otranscribe.com. With this tool the transcriber can pause, rewind, and fast-forward the audio using keyboard shortcuts. “By displaying text in particular ways, we provide grounds for our arguments” (Riessman 2002). Accordingly, participants’ utterances have been transcribed in totality along with any observations noticed during the think-aloud sessions—silences during the sessions or their pace browsing the website—and nonverbal communication signs inferred from recordings—if they were surprised, annoyed, or enthusiastic. In contrast, the questions or comments of the researcher were instead summarised in order to draw attention to interviewees’ data in the following stage of the research.

In order to avoid their explicit identification with responses and statements, individual museum professionals are identified with the label of "museum practitioner" and are numbered, whereas scholars are identified as "scholar" with numbers differentiating them. When transcriptions from interviews and think-aloud sessions are quoted in the following chapters of this thesis, these are cited using the label and number of the individual as well as the date of the interview or think-aloud session. In the full transcripts, the research subjects can be identified by other professionals and experts. It is for this reason that the transcripts of the interviews and think-aloud protocol sessions were submitted for the thesis examination only and stored securely in Enlighten, the University of Glasgow repository.

3.7 Analysing data: The coding process

This stage of the methodology is a particularly important one, as it starts giving shape and coherence to the data collected and transcribed in order to be presented in the research discussion chapters. Transcribing the recordings of interviews and think-aloud protocol sessions facilitated the coding process. The immersion in the data, facilitated by the recording transcription process, led to an even more precise outline of the final structure of the codes and therefore of the thesis’ research findings. A code is “a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (Saldaña 2013, 3). Coding is briefly defined as “taking raw data and

raising it to a conceptual level” (Corbin and Strauss 2008, 225). Data raised to its conceptual level results in the generation of multiple codes. Even though coding practice was originated in Grounded Theory, its usage extends to additional qualitative research methods, and multiple coding varieties can be found, among them narrative coding. Moreover, it is suggested that if required by the investigation, the researcher may develop a hybrid coding method or customise existing schemes (Saldaña 2013, 65). The narratological approach of this research leads the coding process towards the distinction of emergent concepts, attributes, and topics in the data and relates them to narratology. In order to develop this coding, not only existing varieties of narrative coding (Saldaña 2013, 131-136) but also essentials of grounded theory coding practice have been taken into consideration.

The narrative coding variety “applies the conventions of (primarily) literary elements and analysis to qualitative texts most often in the form of stories” (Saldaña 2013, 131). This research coding scheme is fundamentally designed on the basis of structural narrative analysis (Riessman 2005 and 2008). As opposed to grounded theory coding, prior to the narrative coding process, the researcher needs to establish a mode or scheme for reference based on narratology. This scheme will determine what narrative elements will be coded in the transcripts. Often this coding scheme responds to the identification of elements of a story. For instance, Franzosi (2010) applies what he calls “story grammar”, a “set of rules that provides the categories” for elements in a narrative, such as characters, actions, time, space, and their relationships with the story events (Franzosi 2010, 23). The coding scheme of this research is grounded on the narrative elements identified and described in the literature review. The scheme covers in depth certain elements that encompass aspects of the story, in addition to authorship, readership, media of the narrative, space, and time.

The coding process is iterative. Authors agree that, in working with data, researchers refine, amend, and reinterpret the codes during the process (Corbin and Strauss 2008, 176). Saldaña (2013, 51) proposes two coding cycles: in the first cycle, data is simply split in segments or excerpts and codes are generated; in the second cycle, codes are reorganised and regrouped into “axial” categories according to new insights and discoveries during a review phase. Axial coding, used in grounded theory, belongs to the second cycle according to Saldaña (2013, 3, 51- 52). During the first coding cycle, the initial codes were generated. On a second cycle, first cycle codes were refined and rethought and axial codes were created.

Nvivo, a computer-aided qualitative data analysis software (CAQDAS), was employed to generate axial codes and subcodes from the transcripts of both museum professionals and scholars. Nvivo extracts transcript excerpts related to each code and subcode and groups them together. Codes and excerpts are exported to an easily manipulable format. Nvivo exports the codes as folders that contain the subcodes’ text files; these text files include all excerpts. Isolating tran-

script excerpts facilitates further analysis of the interrelations between code categories or concepts from professionals and scholars.

Codes and subcodes are illustrated in Figure 3.1. Narrative-related categories also shape the sections of the research results chapter. Those include the following axial codes: authorship and readership, mediality, time, and space. Publication and exhibition were employed as additional axial codes as a result of the responses to certain questions during interviews and the think-aloud protocol.

It is important to point out that, although code frequency across the data has relevance in the analysis of results and our final definition of art museums' online resources, uniqueness and diversity are also taken into account when analysing data. Individual responses or perceptions revealed during the data collection are recognised in their own right, for example, in relation to the narrative notion of authorship, only one scholar reflects on how collective authorship in museums is represented and perceived by scholars. Quantifying the codes, as Franzosi (2010) proposes with his "quantitative narrative analysis" (QNA) work, was a plausible option that was ultimately discarded, as this would imply a very different scope of our analysis.

Moreover, the possibility of analysing the codes' connections visually was considered at this stage, although it was not deemed necessary in order to extract the results and drive conclusions, as it would only highlight the same aspects of the data rather than offering a new perspective on the research. However, this kind of visual analysis could be performed anytime, thanks to the codes' structuring, in order to present the data at academic conferences and gatherings. Visualisations can be good tools for communicating overall and quantitative views of the structured data.

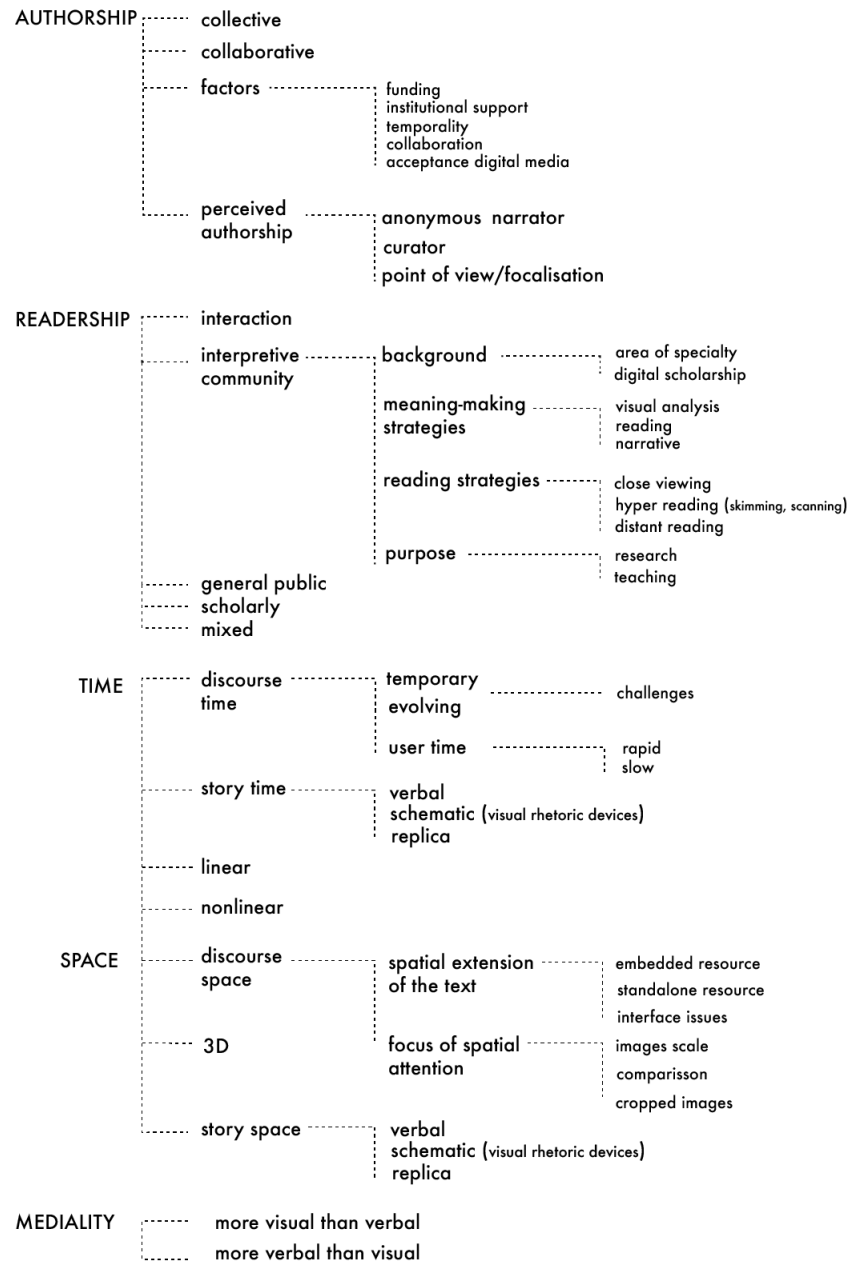


Figure 3.1: Schema of the codes used to analyse the research data. Figure by the thesis author.

Chapter 4

A selection of online resources

4.1 Introduction

In compiling the survey of art museums' online resources the following variables were considered:

- Typology of online resource as indicated by the institution, whether the resource is an online publication, online exhibition, exhibition website, or interactive resource.
- The implied audience for which has been created. Drawing upon the notion of the implied reader, online resources are characterised as general audience or scholarly oriented.
- The media used in the resource. The survey lists text, image, video, audio, and diagrams (visual rhetoric devices), and indicates when a text is long form, presented as an essay with footnotes and bibliography, and when advanced imaging is used, which comprises high-resolution images, documentary imaging, x-rays, and radiographs.
- Voice. The variables are third, second—when there is a conversation—, and first.
- Narrator. If there is an anonymous narrator—the museum—, a curator or scholars, and an artist.
- Space. This variable applies to the use of two-dimensional and three-dimensional space.
- Linearity and nonlinearity. An online resource is linear when it has a single page that is scrolled, the opposite case is when a resource is nonlinear.

- **Temporality.** Resources are classified as permanent, when the resource was created as a one-off and preserved as such; episodic, when evolves over time usually presenting content in the form of episodes; and temporary, when the resource lasted for a limited time.
- **Embedded and stand-alone.** Resources are embedded or integrated in the main museum website but they can be built as microsites.

The examination of these variables provides a quantitative analysis of online resources. The survey shows that there are 25 publications, 38 interactive features, and 54 online exhibitions. The narrators of online resources are 86 anonymous, 38 curators or scholars, and 5 artists. The voice used by resources is prevalently the third person, which in six cases is combined with first person and in three cases with second person. 92 of all surveyed online resources are developed for a general audience, and the rest, 32, for scholars and students. Only three resources from the survey employ three-dimensional space. Most resources are conceived as one-offs and “permanent”, 125 of them, only four are episodic and one was temporary at the time of the completion of the survey, and in fact does not exist anymore. A majority of online resources are nonlinear, 84 of them, 36 are linear, and 11 combine linearity and nonlinearity. With regards to whether resources are standalone or embedded, they are predominantly standalone sites, 112 of them, but the rest are, 18 resources, are embedded in the main museum website.

Taking into account the variables from the general survey of online resources, six online resources were selected for further research in this thesis. Each of the six selected resources is singularly distinctive, while presents the commonly used narrative features variables illustrate.

4.2 82nd & Fifth. The Metropolitan Museum of Art

The interactive feature *82nd & Fifth* is one of the Metropolitan Museum of Art’s seven online productions the museum currently offers on its website. The other features are *The Met’s Heilbrunn Timeline of Art History*, *MetCollects*, *The Artist Project*, *Connections*, *Met Around the World*, and *One Met. Many Worlds*. All of them have in common a rather educational or interpretive scope. They contextualise the objects in the museum’s permanent collection through multiple media and diverse narrative approaches with a focus on the non-specialised audience. These features are prominent examples of rich media online resources. The firstly created of these resources, *Timeline of Art History* sets the tone of the following six. It is one of the most popular digital publications for students to study art history online. The timeline accounts for one third of the traffic of museum website, according to former chief digital

officer, Sree Sreenivasan (Giridharadas 2014), showing the enormous potential of online resources that provide introductory art history contents beyond the collection database scope.



Figure 4.1: Detail of the home page. *82nd and Fifth*. 2013. [https://82nd- and- fifth.metmuseum.org/](https://82nd-and-fifth.metmuseum.org/)

Choosing *82nd & Fifth* over the other interactive features, and in particular over the remarkable *Timeline of Art History* was guided by different reasons. Firstly, the narrators of the different stories featured in the resource are the museum curators who use a first person voice to transmit the message. Usually, curators are the authors of art museums narratives, though their voices are subordinated to the museum authority. The MET is one of the very few museums on the survey to employ the kind of first person narrative which emphasises subjectivity. In this feature the aim was to challenge "the curators to reflect on a work of art with which he or she has an intense intellectual connection and an equally intense emotional connection. Each curator had to make the case that encountering a work of art can be transformational" (Lai and Noey 2013). Due to this particular characteristic of the online resource, it is possible to discuss the authorial turn with the participants of the study. Secondly, the spatial design of the interface and thematic temporal ordering of the objects is also of interest. The online resource was conceived as a series of themes that populated the website periodically during one year, after that year, the site remains as a record of the periodical themes which now can be consulted. The resource is also a good example of an unusual approach to the relation between text and image. Artistic objects cannot be easily identified in the site because of two reasons: first, the object image is cropped up and a detail is being shown rather than a whole view of it; and second, the objects are presented under a theme, rather than by their titles or the name of the artists who created them. It dares the reader to guess what is the object featured. This level of decontextualisation is an interesting subject for

discussion around meaning making strategies. Moreover, the online resource uses multimedia to visualise and explore the artistic objects in a variety of ways. For each object, short videos present the curators' stories, and photographic exploratory methods describe the objects. These methods include: three hundred and sixty or 180-degree photographs, image close-ups with interactive captions, documentary and contextual images, archival video or audio footage, page turning—for objects with several pages—, and juxtapositions of the artwork colour image with its radiographs or infrared photographs. Each object is paired with one of the exploratory methods, a method that it is expected to enhance the understanding of the object and its most remarkable historical, aesthetic, or material qualities. These exploratory photographic methods also add variation to the rhythm of the overall storyline.

For all these reasons, the online feature could be considered a unique example of its kind. Other online resources from the survey, either from the MET itself or other museums, share certain characteristics with *82nd & Fifth*. Regarding authorial approaches, a couple of the MET's online features, *The Artist Project* and *Connections*, present a view on the museum collection from the first person voice driven approach. The perspectives of contemporary artists on one case, and museum staff—including conservators, librarians, educators, editors, designers, photographers, security personnel, and others—on the other case. Similarly, the Portland Art Museum online project *Object Stories* produced a series of videos—the videos were initially hosted in a microsite and not on YouTube as is currently the case—in which the local community would present personal connections related to objects. Some of the denominated as exploratory methods of *82nd & Fifth*, are also present in some of the other MET's online features or several art museum's resources. For example, interactive closeups with captions on the image of a painting or sculpture are used at MET's online resource *One Met. Many Worlds*, at the Minneapolis Museum of Art *Art Stories* online resource—or digital exhibition according to the Museums and the Web Awards categories—, at the Städel Museum *Digital* online publication series, and in one of the other cases of study of this research, the Museo del Prado's *Scrollytelling*. Interactive digital imaging techniques, such as juxtaposed images or 360 degree views are once again widely used by museums to visualise material aspects of artistic objects and digitally manipulate them. Lastly, the episodic and temporary component of *82nd & Fifth*, although not widely used by art museums, is still a narrative resource utilised in a small number of online exhibitions. A good example of this component would be the *Tate Gallery of Lost Art*, a temporary online exhibition that lasted for a year, during which the artworks included in the exhibition were periodically added to the online space, as means to repeatedly engage the audience through time.

Last but not least, the denomination of the online resource itself is a strong reason for its selection for further research. For several aesthetic and content wise reasons, *82nd & Fifth*, fits both in the typology of online exhibition and online publication. On the MET's website it is

prominently featured on the list of "Online Features", although it can be found under the "Publication Type" category "Online Publication". Moreover, it was labelled as an "Online Exhibition" on the list of nominees of the Museums and the Web Conference Best of the Web Awards in 2013 (Museums and the Web, 2013). This ambiguous labelling gives the opportunity to unlock the discussion of this doctoral research on online resources typologies.

4.3 *Online editions.* National Gallery of Art, Washington D.C.

The United States National Gallery of Art produced its *Online Editions* as a result of its participation in the Getty Foundation's Online Scholarly Catalogue Initiative (OSCI) that reunited eleven art museums in order to foster new models for digital publishing of scholarly knowledge about museums collections (Getty Foundation 2017). To date, the Gallery has edited three different catalogues: *Dutch Paintings of the Seventeenth Century*, *Italian Paintings of the Thirteenth and Fourteenth Centuries*, and *American Paintings, 1900–1945*. Each catalogue comprises analytic art historical information about the Gallery's permanent collection artworks informing specific art historical periods and/or artistic schools. Each catalogue contains entries of the works of art encompassing the artwork's 'tombstone'-type metadata, introductory and scientific essays with illustrations, exhibition history, provenance, bibliographic references, related multimedia contents—when available—as well as the artwork's images (high resolution reproductions of the paintings, technical imaging and reconstructions), a glossary of technical terms, artists' biographies, and a number of thematic essays. These catalogues used to be enormous books produced by the Gallery's Publishing Office for scholars and academic libraries. As updates are periodically required according to new evidence in art historical research, the implementation of digital publishing offers multiple possibilities for a more effective authoring process as well as reduced printing costs, while increasing access and engagement with scholarship. And of course, digital publishing allows for visualisation and reading enhancements, the consultation of more and higher quality images along with the text, and substantially more effective browsing and information search.

These editions were not only selected for in-depth research because of the thesis author's professional connection with the Gallery's Publishing Office and the Online Editions themselves. As previously mentioned, the online scholarly catalogues produced not only by the National Gallery of Art but also by the other museums within this initiative, are a paradigm for many art museums. They represent a model for digital scholarly publication nowadays. The OSCI initiative aim was solve multiple issues regarding scholarly publishing as reflected in the various articles published by other museums, such as the Chicago Art Institute (Quigley and Neely 2011; Quigley et al. 2013) and the Seattle Art Museum (Yiu 2013). According to these

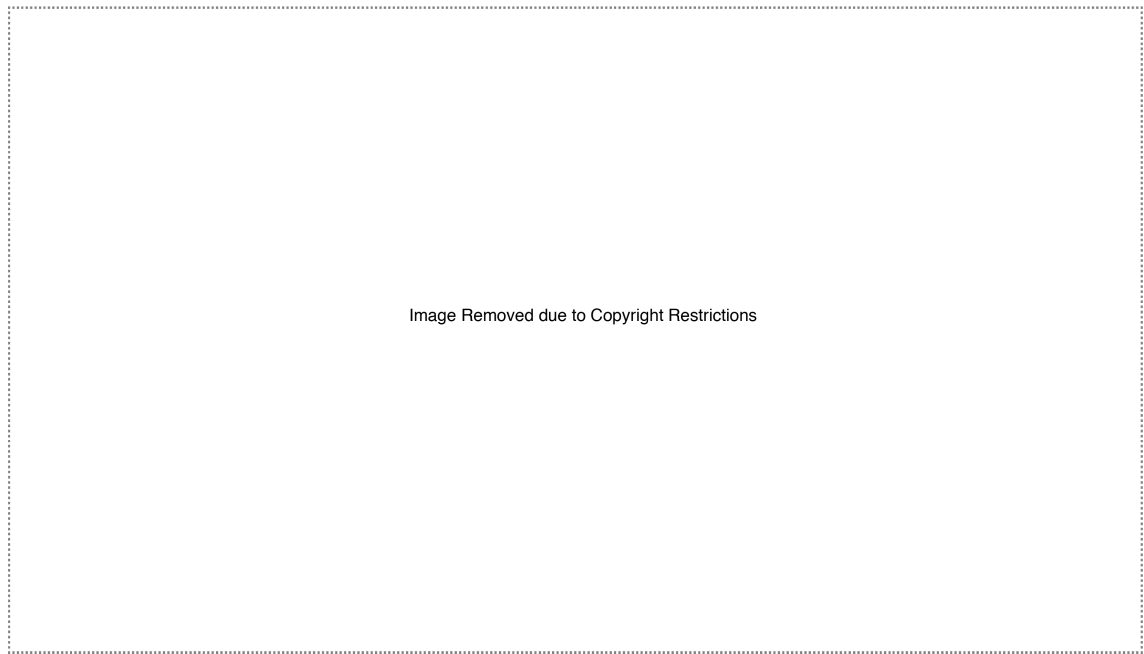


Figure 4.2: Screen capture of the *Online Editions* home page. *Online Editions*. 2014. National Gallery of Art. <https://www.nga.gov/research/online-editions.html>

authors, the resources are designed to provide scholars with "structured narrative experience with opportunities for self-guided exploration" (Quigley and Neely 2011) thanks to a model that combines the best of the book-like linear narratives with the parsed structure of the database, in which most museum base the navigation of their collections. The National Gallery of Art *Online Editions* follows this model, yet it is fully integrated in the main website—which was also redesigned to host the online editions. This would facilitate the user's serendipitous encounters with the catalogue entries while browsing the main site as opposed to other museum's catalogues from the same initiative which are more self-contained and resemble microsites. Only two other museums within the same initiative, Tate and SFMoMA, share a similar design of integration within the main museum website, but several other online resources listed on the survey embed resources in the main website.

Image visualisation represents an equally important feature of these catalogues. The National Gallery of Art employs the high resolution image server for web-based streamed viewing and zooming IIPImage (Beaudet et al. 2014) developed as part of the International Image Interoperability Framework IIIP. This technology, which is also implemented across the Gallery's main website, favours a closer view of the artworks' images—when permitted by the copyright licensing—and as part of the online catalogues the image server and viewer facilitate the comparison of images. In this regard, the National Gallery of Art follows an increasing practice in art museums: the visualisation and provision of high-resolution images. An increasing number of museums have adopted tools developed as part of the International Image Interoperability Framework IIIP with this aim. Given that scholarly catalogues are heavily text

based, reading enhancements are critical to their conception. Among these reading enhancement features are the interactive paratextual elements, such as footnotes and figures, along with a "reader mode" which transforms the interface of the page to facilitate the interaction and assimilation of the entries. Previous versions of the entries are provided as pdf downloadable files, in addition to the current version hosted in the website. The pdf in this case, is a different format for reading that also serves for storage and reuse purposes.

The way in which the *Online editions* have been designed speak about the particular needs of scholars when dealing with information on the web. Their structure and features respond to the need for improving a previous established and successful model which had not been questioned until very recently, unlike the online exhibition. Thus the Gallery has to maintain its best strengths while amending its weaknesses. In the context of this research, studying such online resource responds to the need for understanding the challenges faced by museums as producers of the resource, and the reactions of a scholarly audience that deals with a revisited version of a familiar device, the publication.

4.4 Scrollytelling. Museo del Prado

As the survey shows, online resources are very frequently conceived as companions to temporary exhibitions. Instances of exhibition websites in the survey are abundant. In the case of El Prado museum's *Scrollytelling*, an interactive feature of educational scope unfolds a short engaging story related to a temporary exhibition—in which web page is embedded. Based the model of this first one, the museum has produced three of these online interactive resources for the following exhibitions: the retrospective exhibitions *Bosch. The 5th Centenary Exhibition*, and *The Art of Clara Peeters*, as well as the thematic exhibition *Meta-painting. A Journey to the Idea of Art*. It is important to note, however, that during the research interviews and think-aloud session, only Bosch's *Scrollytelling* was the object of discussion, given that the two subsequent websites were created afterwards. In December 2015 El Prado museum launched a new version of their website which obtained the Webby award for the best cultural institution site on 2016. The new version of El Prado's website employs the very popular model of linear scrolling interface. A model also exploited by the museum's online interactive features. The resource makes use of the gesture of scrolling the page vertically in order to reveal the images and texts constructing a narrative which provides an overview of different artworks on the exhibition.

The widespread implementation of linear interfaces in museums' online resources was a strong reason to select this online interactive feature for further research. The survey demonstrates the widespread use of linear interfaces among museums. Parallax scrolling, a technique in which

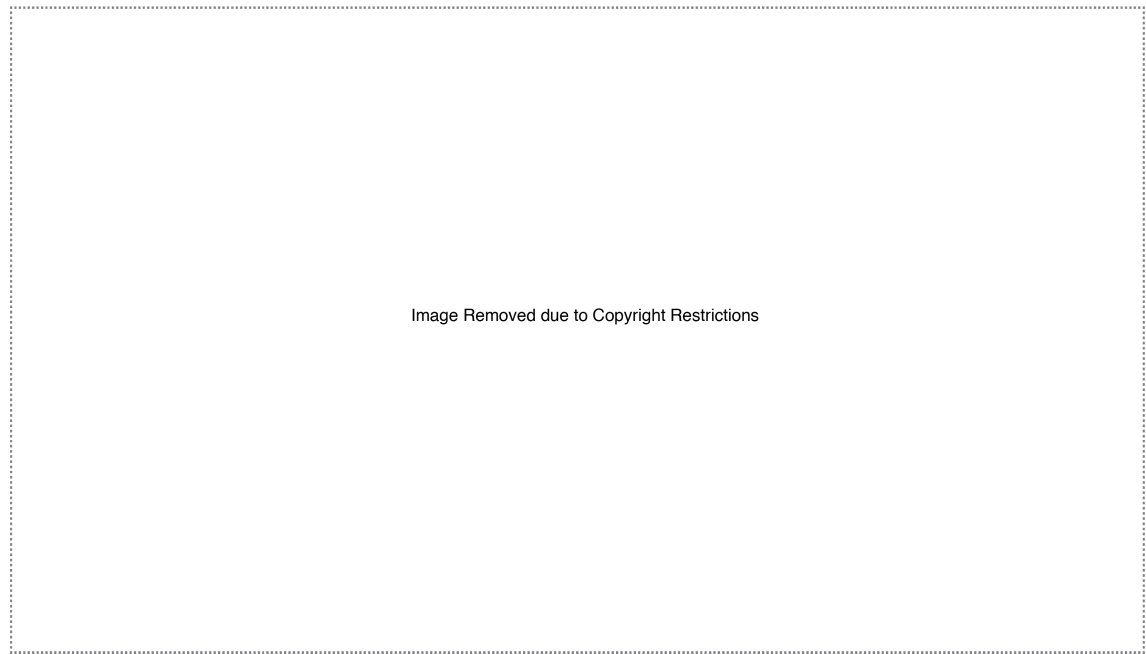


Figure 4.3: Screen capture of the *Scrollytelling* launching feature integrated in the *Bosch. The 5th Centenary Exhibition* page. *Scrollytelling*. 2016. Museo Nacional del Prado. Visted on 10/10/2017. <https://www.museodelprado.es/en/whats-on/exhibition/bosch-the-5th-centenary-exhibition/f049c260-888a-4ff1-8911-b320f587324a>

several elements on the web page move at different speeds, providing a sense of two dimensional depth, stretches the affordances of linearity. The use of parallax storytelling reached its peak with the Pulitzer winner New York Times online project *Snow Fall. The avalanche of Tunnel Creek* (Branch 2012). Considered as a perfect example of a digital continuous narrative it "enlighten readers with analysis, anecdote and depth, rather than simply inform the public" (Koci Hernandez and Rue 2015,100). In recent years, a good number of museums, both art and non-art museums, have embraced this approach in order to engage a general audience. Some relevant examples similar to El Prado's *Scrollytelling* include the *Stories* of the Van Gogh Museum (2015), the *Digital* of the Städel Museum (2015), the Tate *Time Machine* (2016), or, a non-art museum example, the *Digital Stories* of the Wellcome Collection, (Birchall and Faherty 2016). Paradoxically, in the particular case of El Prado museum, this alliance between digital journalism strategies and museums' narrative input has been also taken place outside the realm of El Prado's own museum website. As a result of a collaboration between the Spanish newspaper El País and the museum, the newspaper has regularly produced promotional online resources for temporary exhibitions which also follow some of the principles of the scrolling down narratives, for instance, this is the case of the special resources, *Goya de Paseo por Madrid* (2014) and *Pasión. Van der Weyden* (2015).

El Prado's online interactive resource is also characterised by several particularities. In the first place, the resource is embedded within the temporary exhibition page unlike the examples mentioned above. Within the exhibition page, the user could click on a highlighted image and

icon, and subsequently the feature would unfold. Another significant characteristic of this resource is that its primary medium is the image, and the text is minimal and limited to captions. As the user would scroll down through the page, close-ups of different paintings would appear along with small captions describing the artist biography, while at the same time, small icons invite the user to click on them and open up additional explanatory captions about the painting motifs and iconography. When the user continues to scroll down the images and text would fade and scroll out of view until the subsequent images and text would fill the space on the screen.

In summary, selecting this online resource responds on one hand, to the aim of interrogating the implications of linearity in online resources and in particular the technique of parallax. El Prado's *Scrollytelling* puts emphasis on a model for art historical narrative based on the combination of images and text, with the texts being subordinated to the paintings' close-ups in this case similarly to the use of annotation tools in scholarly resources. This enlightens the debate between the verbal and the visual. In sum, whether the use of parallax for narrative purposes and the juxtaposition of images and text are effective means to tell art history is at the core of the selection of El Prado's *Scrollytelling* for in-depth research.

4.5 *Building the Picture: Architecture in Italian Renaissance Painting.* The National Gallery, London

When provided by art museums online, temporary exhibition catalogues come usually in a pdf or epub format rather than as an enriched web-based resource. In this sense the National Gallery online catalogue *Building the Picture: Architecture in Italian Renaissance Painting* is a rarity in the United Kingdom context and worldwide, where an exception is the Chicago Art Institute online exhibition catalogue on *Ensor*. Both the exhibition—held during 2014—and the online catalogue were produced as the result of a research collaboration between the University of York and the National Gallery which was funded by the Arts and Humanities Research Council. Temporary exhibition catalogues are often considered profitable outcomes of the exhibition and this determines their print status. There are therefore, economic and societal reasons to provide them online, and this is generally because the research to produce them has been funded by a public body. The temporary thematic exhibition about the representation of architecture in Italian renaissance paintings by several artists, that was accompanied by this catalogue. It included a number of artworks from the National Gallery's permanent collection in addition to some masterpieces from other museums in the United Kingdom. Conceived for a scholarly audience, the catalogue fulfils the mission of the National Gallery as high-quality scholarship provider without a cost for the audience and at a distance

(Campbell, 2014).



Figure 4.4: Screen capture of the online exhibition catalogue opening page as it appears in the National Gallery website. *Building the Picture. Architecture in Italian Renaissance Painting*. 2014. National Gallery. <https://www.nationalgallery.org.uk/paintings/research/exhibition-catalogues/building-the-picture>

In the way the exhibition catalogue is integrated in the National Gallery’s main website, this online resource is similar to the *Online Editions* of the National Gallery of Art, even though the navigation is slightly different. This kind of integration in the main museum website could benefit discoverability. The catalogue opening page is structured in a grid which showcases different sections or chapters with links to the essays and picture galleries. At the same time, the sidebar menu includes ordered links to those sections resembling a book index. The menu highlights the position of the reader within the catalogue when the user is browsing each section. There are a variety of content provided by the catalogue: thematic essays and artworks essays with selected bibliography written by different authors, as well as high-resolution images of the artworks featured in the exhibition. The artworks images can be zoomed and compared in pairs thanks to the image server and viewer IIPImage—the same utilised by the National Gallery of Art in its *Online Editions*. Yet, the works of art which are not from the permanent collection are not available for zoomable visualisation, and their reproduction does not present the same level of detail. This is not surprising given that unfortunately, both due to the availability of photography equipment to reproduce the artworks, and/or the often restrictive existing image licensing copyright for reproductions of artworks from external institutions most art museums—including other case studies in this research—struggle to provide high-quality images from other museums.

The National Gallery exhibition catalogue constitutes a different approach to the idea of

remodelling and rethinking museum publishing with digital methods. As opposed to other scholarly focused online resources of this research—such as the National Gallery of Art *Online Editions* or MoMA's digital publication/research resource—the scope of this catalogue is to serve as a complement of a physical exhibition or as its record. For these reasons its inclusion as case study offers an opportunity to discuss and analyse the redefinition of a traditional typology, the exhibition catalogue and its narrative apparatus, in the context of this thesis.

4.6 *Object:Photo*. Museum of Modern Art, MoMA

As an online resource whose typology is divided between the online publication and the "interactive digital research platform" (Osborne Bender, 2015), the Museum of Modern Art's *Object: Photo* encompasses the Thomas Walther collection of photography, part of the museum's permanent collection, and a group of essays which delve into different aspects of photography and the collection itself. Developed with the support of a grant by the Mellon Foundation, the online resource showcases the results of an extensive research on the collection. An exhibition was organised at the same time the website was launched in late 2014, however—as the author of this thesis could personally confirm after visiting the exhibition—it presented an alternative narrative to the ones on the website. *Object: Photo* stands out in its own right because of its interactive graphs and data visualisation options. Its approach is not popular in art museums online resources, but a common practice among digital art historians, and digital humanists in general. MoMA itself collaborated with researchers from Columbia University to build a network graph for the celebrated *Inventing Abstraction* exhibition website in 2012, as well as they did with the Jacob Lawrence's *Migration Series* exhibition website in 2015. In recent years, a good number of museums have made use of GIS based visualisations on their online resources and publications, including the Metropolitan Museum of Art, the J.Paul Getty Museum, Tate, and Museo Reina Sofía. However, as collection metadata is made available by art museums and art historians acquire more computing skills, the new research strand gains more relevance.

The title of the resource, *Object: Photo* reflects on the materiality of photography. Every photograph, and every reproduction, has genuine and singular qualities: the granularity of photographic paper, the printing technique, the margins, signatures, or annotations etc. High-resolution reproductions of the photographs are provided to the user, so "the visualization opportunities include the ability to see the photograph as a conservator might, via microscope, or under raking light to highlight the object's surfaces. Photographic connoisseurs perusing the Walther Collection do not have to rely on detecting the steely sheen of a print: chemical analysis confirms it" (Byrd, 2016). This close view on the object is complemented by the

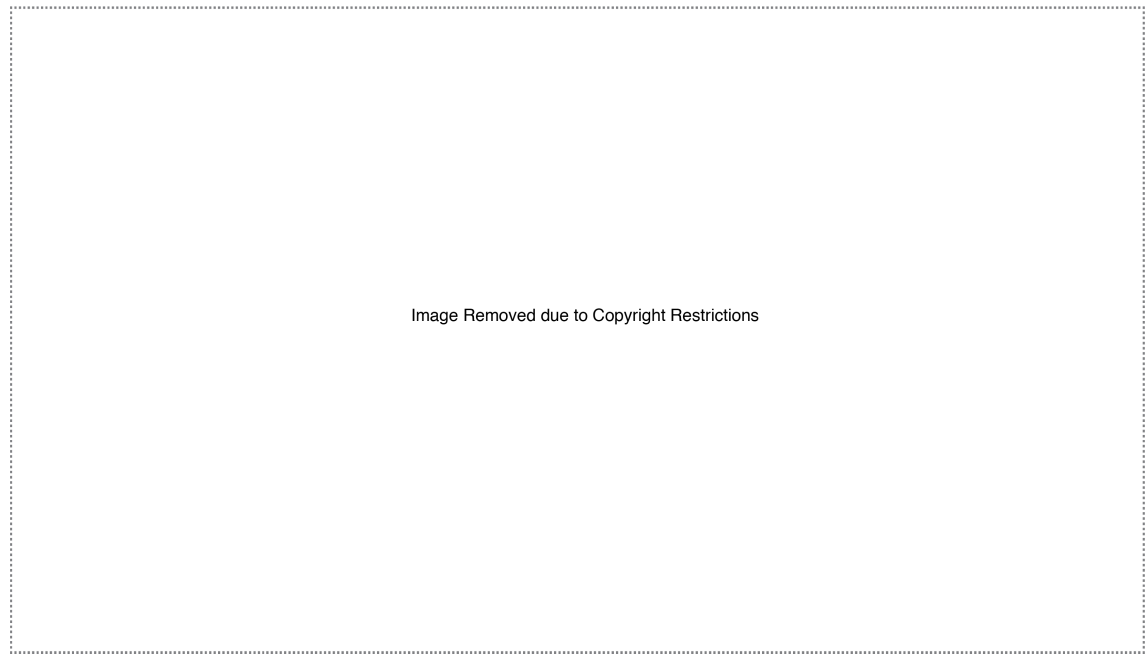


Figure 4.5: Screen capture of the photographs gallery at *Object: Photo. Object: Photo*. 2014. Museum of Modern Art. <https://www.moma.org/interactives/objectphoto/>

contextualising properties of data visualisation. The online resource has four different types of interactive and customisable visualisation options to query the collection metadata: an interactive map with an animated timeline which allows to situate photographs in time and space; a dot chart that enables the comparison of photographs attributes; a network graph which emphasises the connection between artists from the collection; and last, an additional map and timeline which contextualises artists' lives. The input of digital humanities researchers from Republic of Letters project team at Stanford University and the *Photogrammar* team at Yale University is acknowledged on the website credits. Additionally, one of the essays included in the online resource presents the exploratory visualisations carried out by Nadav Hochman and Lev Manovich at the City University of New York' Software Studies Initiative Lab. The fruitful exchange of knowledge between art museums and digital humanities is illustrated in a type of online resource that employs data visualisation methods.

It is important also to note that the Museum of Modern Art has a long list of examples of temporary exhibitions websites or microsites, and/or online exhibitions and, as shown in the Appendix A survey. Along with the Guggenheim museum has lead the practice in this regard. This trend seems to have shifted since 2015, and at present the museum's digital focus appears to be on the main collection website. The overall design of *Object: Photo* favours the minimalist and modernist aesthetics with which contemporary art museums' digital presence has been identified, and "thankfully eschews the Microsoft Word-esque hyperlink in favor of bold red accents that induce the viewer to click upon them for even more material rendered in an appealing minimalist black-and-white palette" (Byrd, 2016). This invites to discuss the

value of skeuomorphic design, which replicates space and other physical entities, and more flat styles in art museums' online resources.

Choosing *Object:Photo* as online resource for in-depth research can open the discussion about new graphic modes to represent historical data and their suitability for art museums' narratives. Whether these graphic methods allow for discourses and interactions not possible with traditional publishing and exhibitionary methods is under interrogation.

4.7 **Featured Artwork. Museo Nacional Centro del Arte Reina Sofía**

The *Featured Artwork* microsites of the Spanish national contemporary art museum, constitute a group of interactive features which provide in-depth information about a selected group of artworks from the museum's collection and part of the permanent general exhibition.

Currently, the museum has six of these microsites or interactive features hosted on its website: *Posters*, Martin Kippenberger; *Medals for Dishonor*, David Smith; *He Disappeared into Complete Silence*, Louise Bourgeois; *Wall Drawing #47*, Sol Lewitt; *Para verte mejor, América Latina*, Paolo Gasparini; and *Livro da Criação*, Lygia Pape. The content of these microsites is suited for the general audience of the museum, although it is not educational or pedagogic in its conception. Instead, the online resource is informational, brief, and to the point without oversimplifying scholarship.

In their design the microsites are similar to the Museo del Prado *Scrollytelling*, as it makes use of parallax scrolling down effects to structure the contents. In comparison with El Prado features, *Featured Artwork* are not embedded in one of the museum pages, and instead, are a microsite. It offers a bigger variety of media including texts, videos, audio clips from the museum's own web radio, zoomable images, in addition to slide-shows of images of both the artwork and its installation within the galleries. The use of text is more prominent in this case in which paragraphs occupy whole sections of the narrative. The parallax effects are used with fixed images which remain in the background of the website while the user scrolls through the website rather than fading out. Because of its linear narrative and functional aesthetics, it reminds of interfaces from other contemporary art museum online resources such as the *Living Collection Catalogues* of the Walker Art Center in Minnesota, the *4 Stories* series of the Museum of Contemporary Art in Chicago, and the Joseph Beuys *Multiples* website of the Pinakothek der Moderne in Munich.

On its website, the Reina Sofía museum's permanent collection is structured following the

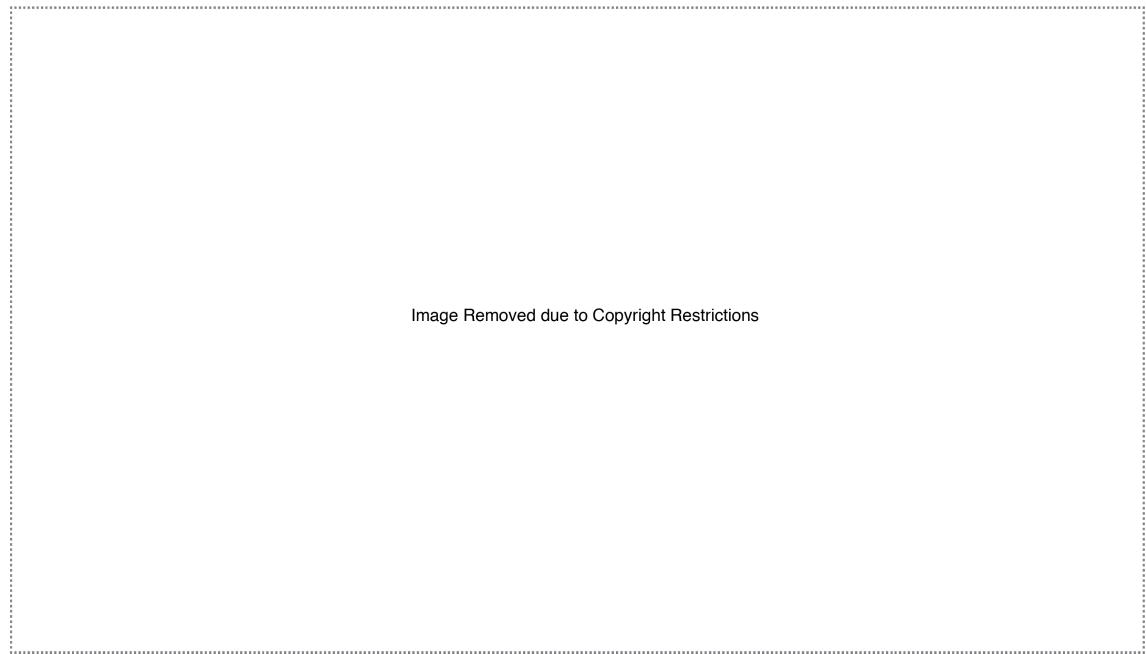


Figure 4.6: Page displaying *Featured Artwork* resources on the museum website. *Featured Artworks*. 2016. Museo Nacional Centro del Arte Reina Sofía. <http://www.museoreinasofia.es/en/featured-artworks>

same narrative as in the physical space. The grouping of artistic objects in three different historical global events and periods of the twentieth century prevail over a narrative of stylistic or national schools. Additionally, they offer to the online visitor an interactive feature in which international institutional collaborations that result in touring exhibitions and a myriad of activities can be explored with the aid of a map. As opposed to extensive approaches in which the artwork, or even the exhibition, is part of a narrative constellation, the *Featured Artwork* offers an object-oriented view and reading to the user. The artist's information and historical context is provided but originated in the object rather than the reverse. In this regard, this is a good example of a micro-narrative. The traditional temporary exhibition, while not being a macro-narrative, it involves several artworks connected through an overarching storyline.

The selection of the *Featured Artwork* responds once again to the interrogation of linear structures and interfaces and its suitability for museological communication such as in the case of El Prado museum, even though in this case the intention is more curatorial than educational. Moreover, the multimedia object centred approach, although shared with the MET's online resource, reveals different nuances of the works of art in this case, artistic objects that in this case are all from contemporary artists. These two approaches can be compared in the research

Chapter 5

Research results: defining art museums' online resources as narratives

5.1 Introduction

While the previous chapter provided a picture of common narrative attributes in online resources and the arguments to focus on six representative online resources to pursue a detailed analysis, the present chapter constructs the definition of art museums' online resources as narratives resulting from the in-depth analysis of the research data. The chapter has been organised in order to reproduce the ordering of the subjects the review of the literature established in Subsection 2.3, making easier to establish parallels and comparisons between previous literature and the present research. Three sections discuss authorship, temporality, spatiality and mediality, and readership. A conclusion conceptualises the definition summing up specific narrative attributes and their implications. The research results are presented as generalisations that can be extrapolated to other online resources and not only the ones that serve the research.

5.2 Authorship

5.2 Authorship in online resources. Collaboration and contextual factors

One idea remains clear after completing the review of the literature and the research phase: authorship in the museum is the aftermath of a collective effort. Yet, one of the first aspects one notices is that this collective effort takes place within the institution. None of the six online resources studied co-author online resources with the input of individuals from the audience, and almost none of the online resources surveyed involves external voices in the creation of online resources. Interestingly, one of the museum professionals refers to audience co-curation when asked about the difference between exhibition and publication, as this professional considers that online exhibitions constitute a form of audience co-curation:

I can see their benefit much more in a form of audience engagement, of getting people to shape their own exhibitions to think about how what a collection means to them to curate their own project. [...] It obviously has benefits. It could work a lot with potential audiences in other parts of the world, but I'm not sure if it's a brilliant way of communicating (Museum practitioner 3 2016).

This suggests that audience co-authorship does not sit well with the mission of some institutions. The museum holds artworks and the knowledge about them, and its narratives are embedded with an authoritative quality. In the digital age, the museum can still be a place to which the audience goes to acquire and receive knowledge. This is a subject that data from scholarly audiences further help to discuss. Before delving into it, however, more attention should be given to how collective authorship is configured in institutions.

The author of this thesis began research having a preliminary idea of how online resource authorship is structured in art museums, specifically with regards to the professional profiles involved in the production of resources and the departmental organisation of those professionals in the institution. The author was also conscious of art museums' unique institutional configurations. It was clear that every museum approaches internal organisation in a different way. The process of recruitment of producers of online resources for interview also provided valuable insights into how authorship is structured in terms of the professionals involved and how departments are arranged. In some occasions, the person interviewed, the professional in charge of the online resource, was the head of a digital department or the chief editor of the museum, whereas in other cases, the direction of the project was a curator's

responsibility. This poses a series of questions about who conceptualises the narrative and if there is an authorial hierarchy in the production of online resource. Insights on authorship input and hierarchies are not addressed by the museums studies literature reviewed, yet, narratology is concerned with the different levels of authorship (Bacharach and Tollefsen 2010). Therefore, these research results introduce new findings in this regard. Overall, research results lead to the conclusion that there are two more or less well defined models: the one in which the digital or another department leads and conceptualises the online resource, and the one in which the responsibility of conceiving the online resource falls onto curators. As a museum practitioner tells:

There are projects that are born digitally at least from their conception. So the idea is what it is and we look for a way to make it happen and there is the other way around. So they come to us “listen, we have this idea, what do you think?” and we work on it. It depends on many, many factors. [...] In our case [...] there’re many projects that originate from our ideas, then we are given a content and a scholarly base to that idea as we speak with curators. But sometimes also curators come to us and say “I have this in mind so let’s do it” (Museum practitioner 6 2016).

But regardless of where the authorial leadership comes from, curators are always involved in online resources:

The first person who is informed is the curator, but the degree of involvement depends on whether he is interested and pays a lot of attention to the contents, or just waits to see what we propose and just gives an opinion (Museum practitioner 7 2016).

Curators are the primary authors of the scholarly and textual contents of online resources:

So if you’re a curator of [artistic period] art and we’re doing a feature that involves our work in your department, I cannot do any of it if you don’t allow me to. So it’s my job to make sure that if I feature you as the expert you sound and look correct (Museum practitioner 4 2016).

In the case of contemporary art, if artists are alive, or their direct family manages their will, artists can be involved in the online resource authorial process:

There are artists who have specific ideas and from the start if I think we can develop some kind of special content related to the artist, the artist when comes to

the museum, we've a meeting with them, and tell them we have this idea for the digital. [...] So with [name of artist] we worked on the contents and asked his widow for permission She saw the video and told us to remove this or add that (Museum practitioner 7 2016).

Curators may develop the central narrative concept of the online resource, make sure scholarship is presented adequately, and create the textual elements of it. However, other professionals are involved in tasks that include web development, digital imaging, video editing, images licensing, and text editing:

We had a project editor who we appointed to work overall on the project. We had a designer but she was a digital designer and she worked in house on our team so she was accounted to this as a specific project [...]. We've got somebody else in as a freelancer to work on the images [...] because we felt that was absolutely essential. [...] What she did was prepare the images and the non [museum] images for digital publication to make sure they were the right size, that was possibly the most complicated part of the whole project. We've got somebody from the [museum] publishing company who helped us with licenses (Museum practitioner 3 2016).

The photographers and post production staff of all kinds, and video editors, camera men, designers, html coders, they all work on my team (Museum practitioner 4 2016).

It is worth mentioning that the online resources studied have been developed by major institutions. These big museums usually have more resources and staff with the necessary knowledge to produce online resources, while smaller museums tend to hire external production companies and contractors, as revealed by one of the interviewee practitioners: "I think a lot of other museums usually hire an outside company to do it, which is great, whereas we have our in-house staff" (Museum practitioner 4 2016). However, even if an institution has a strong infrastructure in place, part of the personnel is often hired ad hoc or on a temporary basis: "They were hired [...] to do the project at the museum, myself included" (Museum practitioner 1 2016).

Whether not having in-house staff to create online resources hinders or facilitates the authorial process is something that needs further attention and for which research results do not provide insights. However, research exposes that hiring temporary personnel may limit the life of the online resource. As explained in the literature review, digital media favours temporally-evolving texts and dynamic authorship processes, and such possibilities may be impeded by not having permanent staff:

You have to hire people who [...] are required in order for [online resources] to function over time. They require maintenance and attention and so museums have to put people in place (Museum practitioner 1 2016).

Anyone who has worked in a museum, and is familiar with its running, is aware of cross-departmental or cross-domain collaboration. In developing online resources, collaboration between different departments of the museum also takes place:

[Education] got involved to some extent. [...] We have an IT department, we have a web department, the curators, the registrar, curatorial records, conservation, images, and publishing, it's a lot. Legal got involved as well (Museum practitioner 2 and 5 2016).

This is a very "transversal" project because it's put together with work from different areas of the museum, right? Well we could work with the content with texts that come from exhibitions or publications instead from education (Museum practitioner 6 2016).

A revelatory piece of information provided during interviews with museum practitioners is that collaborative authorship between digital and non-digital professionals, and digital and non-digital departments, is not without problems. Overall, uninterest in pursuing digital projects and lack of involvement, which might originate in both the digital and non-digital departments, trouble collaborative authorship:

One of the things I found most frustrating about this project initiative was that lots of people didn't want to be involved in it and they were trying to pass the buck all the time, and we ended having a really good and coherent project team who really committed to it and drove it forward. But initially I found it very frustrating and I was always being told: 'oh you can't do that'. But I wasn't told why I couldn't do that (Museum practitioner 3 2016).

The quotation reveals complex issues behind collaborative authorship. Ensuring that collaborative work is effective is key to a successful digital project. According to additional responses of museum professionals, institutional agendas and digital media acceptance among art museum professionals have a notable influence in the success of the authoring process. Museum professionals admitted that they "had to evangelise internally" (Museum practitioner 6 2016) to show the benefit digital technologies offer to museums. Professionals faced problems when they tried "to get curators on board" (Museum practitioner 2 2016).

The literature review states that authors of digital media narratives should perform their jobs differently in order to create digital narratives (Springer and Borst Brazas 2004), and this requires the establishment of new professional profiles (Goodyear 2016). In short, there is a digital shift affecting authorship that research confirms. Institutions undergo a process of adaptation which is initiated by non-digital museum staff. Museum professionals, whose traditional role was not digital media oriented, are required to perform different duties: “I’m a curator essentially acting as the project manager for this” (Museum practitioner 3 2016).

The adaptation process can be complex, and research data proves that in some institutions difficulties arise when digital media professionals are unable to communicate with other museum professionals and vice versa:

We’re speaking a language that doesn’t always makes sense to them, we don’t understand what they say about a lot of the technology things. [...] You can be in a room talking about the same thing and each facet of the conversation is tangled by that person’s understanding of what is being said and my understanding of what we want... I try to convey or [she] is trying to convey may not really be conveyed in the way it needs to be to the technical person. So the technical person goes away with an idea of what we want and it isn’t what we want. [...] Our experience has also been that the technical side would rather not have to deal with what the content side want if it’s beyond of what they understand (Museum practitioner 5 2016).

This brings up the necessity of encouraging non-digital museum staff to gain digital skills as well as to invite digital media and IT personnel to become more sensible to the needs and procedures of curators, editors, educators, etc. Museum practitioners 2 and 5 think that such an issue could be solved by a hybrid profile, basically the “digital staff” that large museums increasingly hire: “a lot of museums are doing that, they’re hiring what I call digital people” (Museum practitioners 2 and 5 2016). Would this pose a risk of concentrating skills and tasks in only some individuals or one department? Museum studies research approaches the diversification and promotion of digital skills across the museum (Barnes et al. 2018), but digital professionals and departments seem to be a common and effective way to deal with the matter. Research results picture the profiles of digital staff. According to the research data, some of the individuals working or leading digital initiatives in museums have a background in art history as well as various digital skills. This presupposes a base knowledge of art history to which new skills are added:

Our background is art history, we are not developers or anything like that, we all have digital training. [...] We have a publishing profile, because we are being sent

the contents and we've to adapt them to the medium, and it requires some thinking about how to publish it. It's easier to know about art history and learn digital tools, than knowing digital tools and trying to learn about art history (Museum practitioner 7 2016).

I am myself an art historian, and then, I've specialised in digital technologies which is good for my work because if a curator comes to me and speaks about [artist name] I know what s/he is talking about (Museum practitioner 6 2016).

I came to the museum as an art historian. My job was to fill a position that was about publishing online [...] With these projects I'm less of a publisher and more of a producer because we are still dealing with the collection, but we are adding audio, video, photography, music (Museum practitioner 4 2016).

An interesting point that two of the above quotations raise is that some of these professionals possess publishing skills and perform publishing duties online. So far, the discussion around typologies, the exhibition and the publication, has been absent from the exposition of research results, but research data on professional profiles, departments involved, and digital skills expand the interrogation of typologies. Although publishing departments and editors have been involved in the creation of online publications—the ones from the National Gallery of Art in Washington, D.C., and the National Gallery in London—publishing skills and activities are also performed in online resources that are not recognised as online publications, such as interactive features and exhibitions. This erases any possible boundaries between typologies based on the authoring mechanisms and duties.

Returning to the matter of skills, one of the research interview questions asked was if curators should acquire digital skills. The question was framed under the idea of the museum curator as a key or principal author of the online resource, and thus the author of the narrative presented. Almost unanimously, interviewees agreed on the fact that curators should not necessarily acquire digital skills, although having them would benefit collegial communication:

Do you think they need more digital skills? I wouldn't think so. Well, to use their own platforms. That's true because that's one thing, if they don't have gone to the website they don't even know what's possible or what they even want (Museum professionals 2 and 5 2016).

I've an idea of the curator from the scholarly point of view, the one who puts together the concept or idea of the exhibition, and thinks about the museography, writes the catalogue. And the curator is everywhere and if the curator has an idea in mind and knows what's going on in the digital world benefits me on my work. However, in my case I prefer a curator who knows a lot about [artist name]

because if doesn't know about him it's a problem. Obviously it would be great if the curator knows a bit of everything and a lot about scholarship (Museum practitioner 6 2016).

If they don't have any ideas about digital but are open to it and approve it that's enough (Museum practitioner 7 2016).

But other interviewees were more keen about the possibility of curators becoming more tech savvy:

I feel very strongly that curators should have digital skills and they should learn digital skills because if curating is quite communication, which is essentially and it's about taking care it's not just physical care it's intellectual care, it's care of your audiences or whatever. It's something you have to learn in the same way you would learn to give a public speech or give a lecture. You'd also have to learn to work effectively within this so I feel it's very dangerous to separate curators from it (Museum practitioner 3 2016).

I think there is a deep interest in this museum and I'm sure in a lot of other museums to encourage curators to acquire more skills I don't think it's a bad idea. I don't really know if it's like... I mean they have other things to do (Museum practitioner 4 2016).

However, if the curator works in a smaller institution, having digital skills can be perhaps more necessary:

It also depends on each institution and the specifics and responsibilities of each job and each department. [...] Every museum is different. [...] When the museum is big, there are several areas and departments, and specialisation levels are more and more important (Museum practitioner 6 2016).

Some professionals recognise that junior curatorial staff can fill in the gaps in terms of digital knowledge and serve as mediators between the digital and non-digital personnel. This reveals that somehow there exists a generational gap concerning the acquisition of digital skills:

The curatorial assistant is a young person and she is very interested in knowing how to upload into the content management system and stuff like that. [...] so I would say it would be nice for everybody in a curatorial department to have one low level... I mean, I've to say 'low level' [member of staff] (Museum practitioner 2 2016).

The notion of digital skills is broad. Either because interviewees described their work as curators leading the development of the online resource, or because they listed what kind of digital skills curators should acquire, the digital skills curators might need in their work are varied. According to the above responses, these range from having a general understanding of how the Web works, to basic coding skills, and familiarity with content management systems. With the rising popularity of digital art history, workshops and conferences propose digital skill sets for curators (The Networked Curator 2018; American Academy in Rome 2018) that go beyond the skills and knowledge some of the interviewees refer to. Some authors also suggest that a “digital curator” figure with the necessary knowledge to lead digital publications can fill a professional gap in museums (Goodyear 2016). The mismatch between what institutions expect from their curators and what academia and research institutes envision for the profession should invite to debate this subject in more detail. Moreover, and according to the insider knowledge of the author of this thesis, often art historians who invest in digital skills are currently hired in “digital” positions. Is this a symptom of the transitional period institutions might be traversing? Would the future be such that all curators would need digital skills to perform their jobs and tell art history to the audience?

One of the criticisms of the narrative approach in museum studies is that it overlooks the constraints and challenges the institution faces when authoring narratives (Macdonald 1996, 5; Mason 2006, 96). The research was designed with the aim of filling this void. Among the interview questions, one of them specifically asked what were the challenges the museum faced when developing online resources. Additionally, the argument was present in other responses of the interviewees. While this account of the research results focuses mainly on the adversities museums have in front of them, the responses of the interviewees also revealed the opportunities which have fostered the development of the studied online resources. This reinforces the idea that contextual factors that surround the production of online resources are both impediments and opportunities. These factors are not foreign to the thesis’s author or museum professionals in general, so the results, although not surprising, gain a new light when seen from a narratological perspective.

Despite the fact that the research studies online resources from major institutions, the economic factor emerges as one of the main elements shaping the creation of online resources. First of all, producing and maintaining online resources requires an often substantial economic investment by the museum: “It’s a very expensive... , it’s expensive to keep up” (Museum practitioner 4 2016). Three of the six online resources studied in fact were created with the aid of external funding. Something that, although beneficial, may impose timeframes on the execution of the resources and requires budgeting creativity from authors:

We didn’t have very much time and we also as is often the case in these projects,

we have a fixed amount of money. [...] I remember I arrived in my job here and in my first week I had to look at this application [...] and it says what it was going to be adequate [...] and at that point none of us knew what this was going to be, what was that going to cost. So we plot figures not quite out of the air but [...] we didn't have a found basis of what to make, of financial calculations, and then we had to stick within that within that budget (Museum practitioner 3 2016).

It is not adventurous to suggest that this factor may have an impact on creativity and choices of complex technologies that require further labour and time to be implemented. Because of this factor, institutions have to adapt themselves to budget-friendly options. Another consequence of this funding model is the lack of support it provides to maintenance and preservation. According to Practitioner 1, the museum should hire more personnel to support these resources over time:

They require maintenance and attention [...] so museums have to put people in place whose job is not only to post new content to the web but to maintain the content that is online, by liaising with curators, heads of departments, with the people who are doing all the various things to maintain those sites (Museum practitioner 1 2016).

However, the fact that online resources require a big investment invites some institutions to conceive of those resources as permanent. This is also closely related to the subject choice of the narrative, since museums might choose to focus on objects from their permanent collection:

When we invest in doing something online, and as you know most projects that are online [...] you have to maintain them forever, right? So in many ways we decide that the investment in working on projects that are about the collection is a dared investment forever, because it's good to update your own content as opposed to loaned objects (Museum practitioner 4 2016).

The connection between the economic factor and temporality is manifest in these excerpts. External budgets and funding impose an authoring workflow and shapes the temporal status of the online resource. This clearly speaks to the temporal aspects of authorship and narratives in online resources. A matter, which is the one of temporality, will be further disclosed in a following section of this chapter on research results.

The economic factor is also present in other opportunities and challenges museums face when they develop online resources. Museums' online resources are provided to the audience at no

cost to them. When institutions seek to obtain revenue from their exhibitions, creating online resources might not be the most economically wise choice:

At some level [it] is using the labour and the funds that might otherwise create another physical exhibition in the galleries, or they have to figure out a way to generate revenue. [...] That's a big question they're facing from that because the books they publish actually make money, they turn a profit and the digital content is expected to be free but as it takes as much of labor, at least as creating the physical book,. [...] People are willing to pay for a book still but they're not willing to pay for that content online necessarily. And in order to get quality content it has to either, something else has to be sacrificed. [...] It's about assessing how these kinds of projects fed into the museum mission and its operational program (Museum practitioner 1 2016).

To an extent, it seems counterproductive to produce online resources, especially certain varieties of them that substitute the print catalogue, if museums do not obtain revenue from them. But as outlined by digital publishing literature (J. Paul Getty Trust 2017), publishing online scholarly catalogues is an altogether cost-wise alternative. This is confirmed by the interviewed museum professionals who explain what led them to consider online publishing for their online publications:

The options we had were to reprint it just as it was, just keep in circulation, take some time to updated it and reprinted it, or we began thinking about online [...] They are very expensive for the consumer. They take years to bring into print because it takes people a long time to systematically examine and analyse and write about the works in that body, and then once they are out there in the market they aren't particularly good sellers. They don't make money it's largely libraries, library sales (Museum practitioners 2 and 5 2016).

The digital medium offers an excellent opportunity for the dissemination of scholarship, which constitutes the main purpose of these online resources. Although ambitious scholarly catalogues can be also costly, require maintenance and should be updated, it is in art museums' missions to generate and disseminate the scholarship that goes into them. This justifies such efforts. However, some major institutions prefer to publish such catalogues as pdf, since web-based rich-media online publications are substantially expensive. This is an issue that needs further discussion beyond the extent of this thesis. According to the experience of the thesis's author, the economic factor in this regard is multifaceted. Institutions indeed make major initial investments in generating a technological and workforce infrastructure, but once

the infrastructure is in place, subsequent online publications or online resources—as one chooses to call them—are not necessarily more expensive than print books. The problem is in setting up that initial infrastructure, something that requires a strong commitment from institutions, yet not all institutions are prepared for this. A very important factor that influences the authoring of online resources is precisely the institutional support to digital initiatives:

It's really important at a highest level of the museum to decide that digital, the digital life of the museum it's important and it's a long term commitment because I think, without that it's very hard to incentivise the IT [...]. I think, I understand [...] we've got to keep the cash registers working in the store, we've got to keep the HR system working but this kind of thing may not... they may don't understand that this is much a priority or that really it's mission based (Museum practitioners 2 and 5 2016).

A desire to experiment and to change is something that shouldn't be stifled by the corporate identity of a museum (Museum practitioner 3 2016).

A generalised opinion is that art museums are rooted in tradition and the past. It would not be adventurous to guess that the lack of support and interest in the digital originates in the resistance to change. Yet, behind the possible lack of commitment or incentive to digital infrastructures and projects in art museums there exist as well a base problem that goes beyond economic factors. This is about shifting the priorities of institutions:

This is not the kind of work that the museum is set up to do [...] I mean [museum] is an enormously is a huge organism, institution, that operates like a very well oiled machine. So when you ask that machine that knows how is a very established structure, how to make a calendar of exhibitions, or how to market an exhibition, how to do press for an exhibition, how to edit the catalogue for an exhibition, or to do an exhibition... When you ask the imaging department to take photographs, not of objects that are already photographed that are already online, but you need higher resolution photographs that don't follow the way that they typically take pictures for the online [...] You're asking a machine to do something that the machine isn't designed to do and that's a huge challenge. [...] This requires a similar amount of labour but is different than the labour required for an exhibition (Museum practitioner 1 2016).

Is it the priority of the institution to put scholarly information online, promote research, engage non-traditional audiences, engage with a local audience, or attract more visitors? These priorities frame the narratives and online resources themselves. According to these excerpts,

art museums' online resources are often conceived as one-offs and exceptional projects for which museums are still finding a place within the overall institutional mission.

The above quotation also implies an operational and organisational matter. Museums, especially when they are major organisations, are established to work within specific parameters, workflows, and departmental structures. Introducing novel approaches to their operations is decidedly complex merely because of the size of the institution. As another museum professional says: "The [museum] is so big, it just takes so long. I think the [museum] is like the titanic, it's big it cannot go that fast" (Museum practitioner 4 2016). The pace of workflows are determined by the organisation, something that affects the temporality of the museum discourse.

Despite institutional constraints and other obstacles art museums encounter when they develop online resources, the present moment is favourable to developments and transformations in the digital sphere:

It always reminds me of say... of early 16th century. I think of the extraordinary excitement and variety, that say, artists like Cranach produced in working with Luther working with the press. This is a new media they didn't know where that was going and I feel that we should be doing the same. We should really be experimenting and we should be thinking of different formats (Museum practitioner 3 2016).

Experimentation and transformation should be pursued in museums. Yet, it should be done by putting digital media at service of the narrative rather than the other way around, as there exists a risk of overshadowing the content:

The most important challenge is thinking that [technology] is a tool and we should work with it as a tool and not as an end (Museum practitioner 6 2016).

I do think that should be said is that digital is a medium it's not the end in itself. It's a way in which you can do a lot of things more effectively than in other medium at the moment (Museum practitioner 3 2016).

Factors similar to the ones outlined by research results were pointed out by literature addressing online exhibitions. These include the "desire to experiment with the new medium", "the availability of appropriate technology to facilitate that experimentation", or "availability of funding" (Liew 2006). In this regard, research is able to draw connections between research and practice on online resources and narratology. This should invite future research to continue reviewing and critiquing online resources upon the contextual factors which frame them.

Summing up the results exposed in this subsection, in similarity with physical museums, authorship of online resources is collective, collaborative, and the result of contextual factors. However, the digital nature of the authorship implies that the authors involved in the creation of online resources are involved in the production of different outputs—from text to software—collaborate with digital professionals, and are required to have a different set of skills. Research results show that museums are still immersed in a shifting process from analogue to digital. This process is reflected in the challenges museum face, from adapting professionals and the institution to new practices, to economic and institutional constraints and opportunities.

5.2 Authorship perceived

One of the questions the literature review concluded with was relative to whether or not institutional authorship is transformed in online resources. There are extensive arguments supporting the idea of the digital medium as disruptive, more open towards other perspectives, and egalitarian (Weible 2011). These arguments apply to museums, that when adopt digital media, embrace these values. Research results show that online resources have great potential but could do even more to provide more transparent and multivocal narratives relevant to the scholarly community.

The previous subsection has established that the museum authorship is collective, and recognises that several authors contribute to the narrative at different levels and with different outputs, for instance, writing a text, editing images, or designing an interface. Yet, the conventions used to present authors in online resources do not always evidence this. Some of the six studied online resources facilitate a “credits” or “about” pages that lists contributors while others do not make this information available. Also, by studying the six online resources from this perspective, it is clear that museums highlight the authorial role of the curator over other professionals. The curator is the main author of the narratives in online resources. The names of curators or scholars who have written texts for essays or delivered a speech that is recorded in a video are provided in four of the six online resources. In summary, collective authorship is not made totally transparent in art museums’ online resources. The criticism introduced by subsection 2.3.4 regarding the concept of narrator and narrative voice in history and museums helps to further analyse the nuances of authorship. Bal and Bryson (1991) as well as Munslow (2007) despise impersonal authorship in history. Moreover, Munslow points to the use of third person as a symptom of this impersonal imprint. All but one of the six online resources use the third person regardless of whether the name of the curator is featured in them or not. Only *82nd & Fifth* presents a personal narrative for which curators use the first person and a rather casual tone to explain the audience their relation with the object and

interpretations. Data from think-aloud protocol sessions demonstrate how scholars respond to authorship representations in online resources. The views of participant scholars denote the complexity of this matter as they point to several unresolved issues that affect museums' digital authorship. Issues that museum studies literature has not confronted so far, as argued in the following paragraphs.

One of the first things participant scholars noticed when visiting online resources were the names of the curators:

I'm just kind of going through this and I'm kind of thinking like, ok, I'd like to know more about like the curator here, so I might just click on. (Scholar 16 2016)

Actually it looks like... [reading] "contributing curators". These are all different people. oh! I know her! (Scholar 13 2016)

This was both a source of curiosity and an invitation to further explore the resource, as well as a reason to trust the contents.

This is also interesting for me just to think about the curators that I know or something like what are they writing about. I know who some of them are and I'd probably get some of those but that's maybe... I would maybe see what they had talked about. (Scholar 11 2016)

[He] is a highly respected art historian so I would think that this was good information. (Scholar 10 2016)

I imagine that each curator probably approach the objects slightly differently, so that might have some more [interest]. (Scholar 4 2016)

However, participant scholars had mixed opinions about whether the narratives provided by curators, especially the more subjective ones, were relevant to them from a professional viewpoint. For some participant scholars, first person narrations were not deemed of interest. But interestingly, early career participants tended to value more highly the use of videos where curators directly talk about their views on an object or exhibition. This denotes a shift on what kinds of narratives deserve scholarly attention:

There are a lot of interpretations about what narrative is, how the [objects] are connected, and all of that. So it might be like a quick way to figure out her impression about it, but I wouldn't really consider that a resource for me. (Scholar 16 2016)

I would never watch this except if for some reason I was working on this painting, and then I would because it's gonna tell me maybe something that [curator] has to say about the painting. (Scholar 19 2016)

I would like to see more about curation. I think that's something that even the general public might be interested in and it's something is simple. It's something like putting as serious interviews videos up. [...] And there are a lot of museums that do that and it's really nice to go to a special exhibit and to be able to see the people talking about how they exhibit came together, and how they actually put it up, and how they made the decision to [...] put things in certain places. [...] Because that's really important to an exhibit but it's not a thing that a lot of people think about (Scholar 12 2016).

What it's interesting sometimes in those it's like the personal story. Just seeing someone from my professional world actually talking about a personal story relating to the painting or a personal feeling about it. For me as a person, I like seeing that because I don't think it happens so often that you see that. [...] That's like the same you would get if you were in a tour with them in person or something like that (Scholar 11 2016).

They've got a curator giving you their personal take on it. Those things you're not going to get through the museum view (Scholar 6 2016).

An important aspect that the three last excerpts evidence, is that the personal and behind-the-scenes perspectives from curators are not always available to the audience, unless the scholar has a personal connection with the curator, the curator is guiding a tour, or perhaps giving a lecture. In this way, the digital medium acts as a broadcaster and breaks a barrier between audience and museum. This along with the use of a first person narrator, transforms the museum authorship making it more open and transparent.

Despite the attempts to introduce subjectivity in online resources, the use of the first person and the emphasis of the museum curator figure is a rare practice on the Web. Museums employ anonymous authorship and omniscient third person narrator in the essays of their websites, and by extension in online resources. One of the participant scholars remarked that it is rare that a Web based resource provides the name of the authors because such practice belongs to print conventions:

I think it's also interesting that they have the authors' names right there. I think my first question is, is this an online edition of a print catalogue or an online born digital? The fact that it actually has his name there makes me think this is not an online edition so I'm not entirely sure that's true (Scholar 14 2016).

I don't see this as publication because there isn't a name here (Scholar 16 2016).

This relates to issues of citing and reuse of online resources. How can a scholar properly cite and give fair credit to the work of others if this is anonymous? Participants are aware of the authoring dynamics of museums, and one of them demands more clarity on who has authored written content:

I think it's sad because some [...] intern or post doc spent a really long time writing that, and they should probably be given more credit. And it would be useful... maybe the overview, you can get really information from that, so who wrote this? If I want to make a comment in a lecture I'm giving or publication I'm writing [...] How can I actually give credit? (Scholar 16 2016)

This quotation also denotes the reality that affects collective authorship—because the participant's response was made about an essay part of an online resource in which the name of the main author was given. Even if one author is singly featured in the resource, other individuals are involved in the writing process, generally assistant curators, editors, and even fellows or interns. Commonly, all collaborators appear in the credits or acknowledgements of the resource, even though it could be extremely difficult to identify which parts of the text were written or edited by whom. This evidence should invite museums to experiment with digital media to represent the collective facet of narratives in online resources. This is an approach that some in the digital art history area have taken. Some have raised the issues that exist on determining “who did what” in digital projects (Zorich 2014, 47). Yet, texts relative to digital publishing have reflected on the potential of digital media to capture collective authorship dynamics: “Hypertext [...] is well suited to capture historiographical shifts and register disputes over dates, attributions, and interpretation” (Ballon and Westermann 2006, 37). More recently, efforts have been put into developing online research projects in which collaboration and processes of knowledge production are made explicit to the reader. For instance, the digital facsimile of the Pietro Mellini's *Inventory in Verse* (2015) of the Getty Research Institute.

It should be mentioned that scholars' preoccupations with duly crediting online resources authorship have roots in their professional experience working with print publications. They are concerned with the rigorous and systematic citation of scholarship. The online publications studied in this thesis facilitate citation, but not the other more general online resources. This appears to mark a difference between the exhibition and the publication type, however there exists online exhibitions that facilitate citation links. For instance, the Getty Research Institute's Online Exhibition *The Legacy of Ancient Palmyra* has a citation button on its right upper corner.

Regardless of whether art museums' online resources use third or first person narrators and make more or less visible the authors of the narratives in them, the perspective offered is an institutional one, and curators act on behalf of the museum. The term *focalisation* (Genette 1980) helps to grasp the qualities of museums' authority. The museum and its professionals make an exercise of focalisation as they tell art history in online resources from a certain perspective. This subsection departs from the idea that "museums are not neutral" as the texts cited in literature review expose (Bal 199; Porter 1996; Lidchi 1997) and discusses whether this has changed as museums embrace digital media. Although this say has negative connotations, providing a narrative from an institutional perspective does not necessarily implies that. Museums consciously use focalisation to represent their idiosyncrasies and differentiate themselves from other institutions:

You have to use that discourse and history with new technologies. We made an effort to be ourselves and maintain our identity while using new technologies. [The museum] has an image, a concept. Our audience has an idea about what [the museum] is and all our efforts are concentrated on presenting what the museum is and its collections (Museum practitioner 6 2016).

The research results, in particular the ones from the scholarly audience, illustrate that scholars acknowledge when institutions focalise the narratives in online resources. Scholars admit that museums present the stories from their own views. In general, participant scholars mention that they trust museums, although remain critical with the narratives presented, and even their accuracy and depth:

This is something only major institutions can do. A small isolated museum with not much budget cannot do this kind of production. (Scholar 15 2017)

They might not be the definitive word on the subject. (Scholar 1 2016)

The quality of what you've being presented with, whether what you're being presented is completely accurate, whether is missing context or nuance, and whether is the best resource to receive the information that you need. And that, of course, it depends on the resource. Some online resources are excellent and very complete and also very clear of what they're offering and others less so. (Scholar 8 2016)

This may be simply the case just because museums' collections only contain a portion of all the artworks that exist. Hence, narratives are incomplete and provide a very specific view of history:

The issue is, no museum has every object of every period of the story. When a museum is representing things there are automatically bias to tell the story of a time and place according to what it is known about it [...], based upon what the collection host. Constraints of what it's owned is the problem (Scholar 16 2016).

This opinion is shared by several other participant scholars who see a problem in online resources centred on one historical period or artistic school, due to the strong bias on the presented narrative. A fact that might even cause confusion to the audience:

They tend to focus too much on their own collections (Scholar 13 2016).

One of the limitations of this... it is limited to what's in the [museum]. So they talk about the [artistic school] and their artists [...] it would be expected to have everything (Scholar 4 2016).

We're getting a survey of [artworks] here? Because we are not, we're getting a very specific collection. [...] I think on the site as a whole there's the tension between am I exploring a collection or am I exploring a period? (Scholar 5 2016)

It's a good social network analysis, I like it, but it needs to be done by a period and from the perspective of the biography of the artist not from the exhibition or the [artworks] in the collection I think (Scholar 5 2016).

The Web and digital media offer alternatives to museums for introducing different perspectives and amplifying narratives. Yet, participant scholars mention those as suggestions that would improve online resources. This implies that narratives can offer a narrative that provides several points of focalisation:

With the digital you can bring so many disparate things that are geographically that actually are far apart together (Scholar 16 2016).

Have a bit more in terms of comparing a work in their collection to something else or reconstructions (Scholar 13 2016).

So I mean it would be really nice to be some kind of shared... I'm going for something really social, some kind shared development of some kind across institutions (Scholar 2 2016).

Interactions between museum should be promoted. This interrelation could happen on the web where they can create common discourses and dialogues. This could be an interesting thing (Scholar 15 2017).

I think that the future of this kind of stuff it's going to be with Linked Open Data. [...] It's kind of like organising the web because these are all silos now. And

Linked Open Data, if we ever get there, it's like linking all the information together that is gonna be able to tell a story very differently. But we are not there just yet. (Scholar 19 2016)

Increasingly more museums, and indeed some of the online resources here studied, facilitate the visual comparison of their artworks with the ones from other institutions. From the simple visual comparisons and reconstructions, to the complex structuring of data that gets interlinked on the Web, there are several options available to museums for advancing and providing a richer and less fragmented picture of history. Although, as Participant scholar 19 points “we are not there just yet”. In fact, very few museums have started to implement Linked Open Data in their collection websites, and even less of them in online resources—one known example is the British Museum Late Hokusai Project (2017) that is in progress at the moment.

This promising digital future depends also on the increase of digitised materials. Some of the participant scholars highlighted the risk derived from the provision of material in art museums online resources due to the following reason: Not every museum has digitised collections in full. “Museums put more and more stuff out there, and younger scholars might have the impression that everything is on the internet when it's not” (Scholar 19 2016). Moreover, very often, major institutions are the ones with resources to digitise their objects, something that also would put at risk the objectivity of art historical narratives beyond institutional boundaries. As one of the participants states: “You're restricting yourself to things that are sort of produced by major museums” (Scholar 1 2017). Digitisation and online resources offer venues to expose neglected or hidden narratives but institutional mechanisms are not always supportive.

Returning to Participant 19 statement on “younger scholars”, it suggests that there might exist a different generational sensibility towards institutional authorship. Something that is also pointed out by other participant scholars:

This is true with catalogues but also websites they can be so universal, especially when students read them. Once they read something on a website they assume it's true. They don't think there are other options or other ways of looking at this, and so they think they know everything by looking at one particular website. That's why I think the bibliographical element is very important because there are other ways to look at things (Scholar 13 2016).

Could this be the result of the students and younger scholars' lack of experience? Do they over rely on digital material because it is easily accessible? Are they not fully aware of the bias that exists in museums narratives? Research results cannot help to answer these questions, which

also fall out of the scope of this thesis, however this little but significant evidence invites to more in-depth research on a generational gap.

Recalling the initial questions that guided this part of the research—whether online resources present art museums’ authorship differently and whether authorship is diluted or transformed in online resource—the results here exposed show that the institutional authority of museums has not changed substantially in online resources. Museums should take further actions to incorporate different narratorial voices and present different perspectives in their online resources. Research findings make clear that technology offerings have the potential to continue transforming authorship, although this transformation is underway and should continue.

5.3 Mediality, temporality, and spatiality

5.3 Representations of history

According to research results, the representation of historical time and places in online resources, the temporality and spatiality of the story of a narrative, follows the models and conventions the literature describes. Time and space can be merely described in written form, reconstructed (Palombini 2016), or schematically modeled as “visual rhetorical devices” (Davis et al. 2016). One of the six studied online resources, one of the National Gallery of Art’s *Online Editions*, provides a reconstruction of the panels of an altarpiece replicating their original arrangement. *Object:Photo* uses various sorts of interactive maps and timelines. *82nd & Fifth* features a map and a timeline to browse the objects in time and space. The remaining online resources pinpoint dates and provenance information in written form. Each representation model has different implications in terms of authorship and readership, yet, one aspect is common to all of them: the concern on accurately representing historical temporality and spatiality.

From the author’s viewpoint, the museum is urged to represent history objectively and precisely. Each representational method poses some challenges in terms of temporality and spatiality, but some more than others. When spatial and temporal parameters of a narrative are rendered in written form some degree of imprecision is permitted. However as those parameters transition from written form to truthful reconstructions or visual rhetorical devices, authors are compelled to make decisions on how to best represent uncertainty:

Humanities research and history research has to account for uncertainty, and it has

to account for ranges or for time ranges [...] It was [...] really important to think about how to structure that kind of data, data that wasn't fixed, that wasn't certain. (Museum practitioner 1 2016).

Although the above excerpt is relevant to the elaboration of visual rhetorical devices, the same principle would apply to the elaboration of 3D or 2D replicas. The accurate representation of the past should take into account imprecisenesses and gaps. In response to such representations, participant scholars recognise that such practice is and should be "rigorous" (Scholar 5 2016). This is a major concern that many researchers in digital heritage and digital humanities have. It is an ongoing common subject of debate both with regards with three dimensional reconstructions and data visualisation. The scholarly readership of online resources receives positively the models of spatial and temporal representation that take full advantage of the affordances of digital media. A finding emerging from research is the great interest scholars have in visual rhetorical devices, diagrams, timelines, maps, etc. to the extent of suggesting that more museums' online resources should make use of them:

I think it would be very interesting to see the provenance mapped out. I would like to see some mapping, where're the artists, maybe also mapping influence of its work or followers. I'm trying to think about other visualisations, like network visualisations that sort of help you to understand who has influenced him and who commissioned works for him (Scholar 14 2016).

Scholar participants demand more sophisticated historical temporal and spatial representations in online resources that go beyond the current practices of online resources:

The other possibility, but that would be a lot of work, is to try to show them in their original context. And that's one way in which you could use virtual reality. It is like all these things were in churches, so you can have people to look at these things (Scholar 13 2016).

The digital environment [...] spatialises both the objects and the social networks and what that means is that we have historical story and unequivocally [...] it occurs in time and space. But it's a story that is always social, so it's always interconnected with environments with other people. And at the same time is always physical, and the digital allows you visualise the physical environment that is spatial where things exist in spaces as well as the social networks, and this is just something we can take much more advantage of (Scholar 5 2016).

These excerpts clearly state that more advantage could be taken from the digital medium to facilitate the comprehension of art history as a spatial and temporal phenomenon. However would rendering original spaces and transporting the audience back in time be beyond the capabilities of art museums? A careful and further examination of the existing technologies can answer such question.

5.3 Temporality

The research results offer an extensive analysis on temporality that expands beyond the ideas outlined in the literature review. After examining the research data, Genette's notion of "discourse time" was proved insufficient to study the complexity and nuances of this aspect in online resources narratives. Nevertheless, authors that discuss temporality in digital narratology give useful definitions of time that help to better understand the phenomenon. Koskimaa (2010, 136) proposes a model in which discourse time is further divided in three different levels: the discourse time, which is the time of the narrative discourse based on the medium of the narrative, for instance, the length of a text or the duration of a movie; user time, conceived as the time the user spends reading or engaging with the work; and the system time, defined as the time a computational device takes to process the code, or the server response time. The interplay of these three temporal levels constitutes the discursive temporality of a digital narrative. Koskimaa's levels intersect with aspects of authorship and readership: Discourse and system times are strongly controlled by authors' construction of a narrative and their choice of medium, whereas user time clearly affects reading processes.

Regarding the first of the three levels of time, discourse time, the data collected provides valuable insights on the matters of permanence and ephemerality and their implications in current definitions of online exhibitions and publications. Mirroring the literature review, the interpretation of discourse time here refers to a broad understanding of Genette's definition of discourse time as the *time of the narrating act*. This broad definition of discourse time converses as well with Koskimaa's work. He identifies "temporal possibilities" in which the digital reading time can be manipulated (2010, 135). These possibilities either limit, delay, or extend the time used for narrating. A digital text is designed to be read during a limited time-frame or to delay and expand the reading. Similarly, the access to a digital text can also be controlled so it can be read during specific times. It is easy to notice connections between Koskimaa's temporal possibilities and exhibitions and publications temporal frames. An analysis of the research data based on these *temporal possibilities* calls into question certain conventions and expands the debate initiated in the literature review. According to literature, temporary exhibitions can be visited during a limited set time and their access is as well limited. Publications instead extend the life of the exhibition and accessing them is always

possible. However, online exhibitions and exhibitions websites function as print publications and reject the transient status of exhibitions, online exhibitions live on the web for an unlimited time (Seijdel 1999). But according to the research results, online exhibitions and online resources developed around temporal exhibitions are not necessarily correlated to permanence, they still hold an ephemeral status. In general, the temporality of the digitalis limited.

Generally, if museums do not develop online exhibitions or resources based on temporary exhibitions it is because, as Museum practitioner 7 explains, “it’s a great effort for an ephemeral result. It’s very complicated so it’s better to focus on other things and provide other types of content in other ways” (Museum practitioner 7 2016). Those contents may be related to permanent collection pieces, institutional history, and other more stable assets the museum may have. The temporary nature of exhibitions has also implications in authoring processes. Creating an online resource based on or to support a temporary exhibition can be a difficult enterprise for museum professionals. The time frame imposed by the exhibition opening makes difficult to gather on time the contents of the resource, something that, together with the big investment needed to produce such a resource, prevents museums from developing online resources for temporary exhibitions:

We, therefore, do not create microsites for exhibitions because of time issues, because we wouldn’t have the materials until pretty late... It’s a matter of planning. The way we work... we rely a lot on the exhibitions departments and very often we don’t get the materials early enough to create a microsite. And then there are issues with copyright that here, in the museum, we are affected by that and stop us from working with some contents because you simply can’t, or need a lot of time to clear the rights to use them (Museum practitioner 7 2016).

Does this mean that museums are not conscious about the potential of developing online resources linked to temporary exhibitions? The answer to this question would be probably probably, no. However, the challenges an institution faces when developing such a resource can outgrow possible outreach outcomes.

Maintaining online resources in which museums had made a substantial investment is another possibility. This possibility is not always taken into consideration by museums, as one of the museum professionals interviewed explained:

In some ways I think we treat them like books. Once it’s published, is on the shelf and then if they look old then, that’s it. All our projects come with funding so [when] the funding ends it’s not like we fund them to keep them going forever (Museum practitioner 4 2016).

This conveys that online resources become outdated quickly and that the digital medium is not the stable or “immortal” medium some claim it to be (Sejdel 1999), or at least, it is not as stable as it could be or should be. The claims that the literature review makes regarding the idea of online exhibitions as storing devices clashes with the above evidence, but not with the expectations of the scholarly audience. Research data shows that the scholarly audience values the storing function of online exhibitions and online resources generated around temporary exhibitions, that they can consult after the exhibition has closed. Documentary media including photographs of the exhibit, videos, essays, and images of the artworks are assets every scholar uses to understand past exhibitions. Scholar participants are however cognisant of the temporal limitations relative to digital media and websites: “Websites, they’re not static they need to be updated, and it’s not easy to maintain. I realise that definitely” (Scholar 17 2016).

Although data from museum professionals does not offer much evidence in this regard, museums often opt for updating not only online resources, but also their websites to the extent of changing the interfaces of the resources and removing content. One of the participant scholars points to the risk of such a practice:

This might result in a lot of stuff disappearing. That’s what the [major museum name] has done. Their website [...] had a lot of scholarly stuff but in the last couple of years... they revamp it in the last 18 months and [...] they are putting up new stuff, but they’re doing it in a different way (Scholar 1 2017).

These findings suggests that there is a value on achieving permanence and stability with regards to online resources. The above evidence should invite museums to strive for the preservation of online resources, and consequently optimise workflows and arrange funding sources to support this effort. The research results do not offer clear solutions to this issue, but museum professionals acknowledge the necessity to tackle it. A “thing” to do is “creating a cycle of refreshment and correction” (Museum practitioner 5 2016). But how can be this optimally done when media is ever changing?:

I think the difficulty is often that the media is not set. It is a changing media we cannot expect it to stay the same. [...] I think that you have to really think about what you’re doing. We have to, at some point, in the not very distant future, be transferred to another digital media, and is it going to be... is it sustainable, is it compatible with that? You don’t know what form we have to be compatible with but really to be thinking of that (Museum practitioner 3 2016).

Should online resources be merely preserved or instead updated? Both the practical experience

of the author of this thesis and existing literature point to the different options available. Briefly put, institutions develop digital preservation strategies to conserve the source code and the interface of the online resource (Persons 2018), use more stable technologies that would eventually prevent resources to be rapidly out of date—a practice exemplified by museums that employ static sites—, or just simply update online resources when they malfunction or look old. Which option is more sympathetic with the needs of both institutions and audience? Although this highly sensitive matter goes beyond the scope of this thesis, it invites to additional and necessary research.

Returning to Koskimaa's *temporal possibilities*, he distinguishes temporally evolving texts, a category that "includes texts that evolve continuously through additions posted by the author or the readers, or both" (Koskimaa 2010, 125). The concept of temporally evolving texts is applicable to the six online resources studied, although in different ways. One of them, *82nd & Fifth*, uses the temporal possibility for creative purposes. Within this resource an episode on a different object—composed by a video and visual exploration of the object—was launched consecutively during the timeline of a year, and after that year is maintained on the web. Additional resources adopt this model due to its suitability for scholarly arguments. The National Gallery of Art's *Online Editions* provide archived versions of the different essays of the resource. Remaining resources offer hyperlinks to the collection database that sync in the data when it is updated periodically. This temporal possibility mirrors Ballon and Westermann (2006) dynamic publishing model. Ballon and Westermann highlight the benefits of this publishing model and encourage authors to adopt it. Interestingly, research shows not only the advantages deriving from the model but also the pressures that it introduces in museum authoring processes:

The other thing I would say for workflow, is a major thing for us. It's that with a book you've to have everything, like all the chapters done at once. So, say we're doing early French, you've to have all 150 entries at once. Now we can put out chapter by chapter. You can pick up an artist at time and do a little bit at a time, which is actually easier for us. But then at the same time, say for example, our curatorial records people, they are now in charge keeping the bibliography and provenance, and the exhibition history current on the website and before they could just have a book with all that in there and say: 'If I don't get for two years to get the city it's ok'. Well, now they can't. It has to be up when the publication is launched. So there is more pressure on them to keep up with this [...] That's been also a major change (Museum practitioner 5 2016).

The transcription excerpt shows that temporally evolving texts introduce interesting possibilities for museums but may as well require considerable efforts to be made by

institutions and their authors. In fact, another practitioner affirms: “This is the kind of thing that can be more effectively maintained digitally but has to become part of a deep institutional policy” (Museum practitioner 1 2016). Museums should achieve a balance between the time-frame imposed by intensive research labour and the possibility for constant updates of the content. An institution may have to guarantee that the constant stream of new research provided in online publications’ essays goes through consuming editorial process such as peer review. Hence, museums may choose to combine both dynamic authoring modes with more static authorship:

So the way we are publishing now is... we have an online database, which is very much curators under their writing into a database and it gets published every night. Whereas [online resource] is still about kind of a very strong editorial structure, so the way we publish the [online resource] now is to present context for a kind of a live database. It’s kind of a perfect/imperfect collaboration between a kind of digital publishing and database (Museum practitioner 4 2016).

Another important aspect of this temporal model is that it clearly rejects the idea of the publication as a fixed and static element— which has substantial implications in scholarship rigour. The scholarly audience is sensitive to the matter. Participant scholar 1 provided an extensive discussion on how scholarship has shifted as museums embrace dynamic publishing and the implications this has in institutional authority:

[I attended] a session organised by [foundation and major museum]. Both made very clear that the way they were publishing their collections online [was] something that [was] work in progress, so it was. These were major national and international institutions saying ‘this is not a definitive thing, this is just where we got’ (Scholar 1 2017).

So far, the research results have identified temporally evolving texts with the scholarly online publication typology. Is this specific temporal model something that effectively differentiates online exhibitions from publications? An initial conclusion leads to respond to this question affirmatively. In fact, two of the younger participant scholars identified *82nd & Fifth* as another genre of online publication, namely a visual blog or an *arts Instagram*, due to the structuring of the contents in “little instalments” (Scholar 7 2016) that are published online as periodic episodes. But a close analysis to some of the sources referred in the literature review reveal some exceptions. The online exhibit *Tate Gallery of Lost Art* (Mundy and Burton 2014) used a similar temporal strategy and added artworks to the online gallery periodically during the year it was accessible online. In conclusion, digital media temporality is clearly transforming

exhibitions and publications defining characteristics to the point of erasing the distinctions between the two of them.

The two remaining levels of time Koskimaa distinguishes, system time and user time, concern readership or audience data. Results relative to user time are a very prominent set of data arising from research. Online resources may require a certain time to be read, which responds to discourse time, but this notion of time can be altered by the system itself and the reader who imposes their own user time. In relation to system time, it can go unnoticed by the reader unless the resource takes more time to load than expected—something that occurred several times while the think-aloud sessions were taking place. Data shows that participant scholars entered online resources with an objective in mind, which was to find information either for teaching or research. The pursuit of this objective frames their user time. Online resources present clear advantages to scholars because as another participant explains: “You can get the information very immediately, because otherwise you have to go the stacks and all these things” (scholar 20 2016). Although literature connects immediacy and rapidness with a lack of engagement (Birchall and Faherty 2016), research participants do not see it in the same way: “I’m very keen to get information quickly” (scholar 3 2016). However, once scholars find the information they need reading becomes slower. As participant 16 explains, “I kind of like move my cursor around to see what is there” (scholar 16 2016), and later in the session points out to the fact that in the visited resource “they have a really long bibliography, so let’s look at what has been done recently... so maybe this is classic thing that art historians get caught off in the content and stop investigating the website” (scholar 16 2016). These quotations illustrate that scholars’ user time is the result of both quick and slow interactions. Nevertheless user time can be impeded by online resources which are not conceived for such temporal needs. On the one hand, the pressing need to get information rapidly makes scholars frustrated if the system time of a resource slows or blocks their reading processes. Surprisingly participants spoke about how “glitches” (Scholar 7 2016), connection bandwidth, and other technical matters disrupt their interactions:

Sometimes I would meet with students and try to zoom into the pictures and it doesn’t zoom like it’s supposed to [...] so I can’t rely on it. [...] In those computers they don’t have the flash plugins so I can’t use them for teaching (Scholar 11 2016).

I’m really annoyed because I don’t like when it’s not working. [...] the pictures take a long time to load so it’s like you cant find information quickly (Scholar 16 2016).

On another note, an online resource is designed to invite readers to spend more time with it but readers alter this temporal order and impose their own user time. Participant scholars praise

immediacy when they browse online resources, but when they find relevant information may spend time with it. This principle applies to videos which have strongly temporal structure and require the user to passively view them. However, most online videos allow some degree of manipulation in which users can accelerate their duration and skip or repeat sequences. During think-aloud sessions participants tended to pay attention to the videos featured in some of the online resources. Although they skipped some sequences, clicked on the video scrubber (the horizontal slider which allows to manipulate the video) so they could anticipate the scenes and decide if the video was worth their time. Yet, those scholars clarified that they do not usually watch videos while browsing a museum website since quickly reading or scanning a text can give them information faster than watching a video: “I would be more satisfied reading an essay by the same curator than to hear her talking about, because I can read faster than watching a video” (Scholar 16 2016).

User time is taken into consideration by museum professionals when they develop online resources. The notion is implied in the responses of the interviewed museum professional. Once again videos are a target of analysis. According to Practitioner 4, if a majority of videos in online resources are a few minutes short is due to users attention span: “I think people’s attention spans are also changing [...] every word is overused.” (Museum practitioner 4 2016)

User time invites readers to manipulate texts in less obvious ways than they do with videos. Indeed, the research results show that reading behaviours are strongly influenced by user time. Participant scholars quickly scan the web pages to assess whether a page contains information that is relevant to them to decide whether to spend more time with it. As participant 11 explains “you see just a little bit of information and you can go further” (Scholar 11 2016). Participants fixed their attention on paratextual elements, titles, menus, illustrations, bibliography, instead of reading long blocks of text or essays. For example, as soon as opening a new page, a participant scrolled down to the bottom of it and verbalised that was looking at the bibliography before reading the essay as a way to understand whether the essay is worth attention: “I’m checking the sources, I’m just looking what they’re citing” (scholar 19 2017). Scanning and skimming texts is considered an intentional behaviour guided by temporality if regarded from the perspective of user time. But, scanning and skimming also helps users to understand the spatial extension of the site as well as its scope, something key to decide where to go next and continue the narrative.

Concluding this subsection, the definition of the temporality that is offered by the interpretation of the research results exposes a complex picture of this narrative aspect with strong implications in the creation and consumption of online resources. The concept of discourse time helps to frame the character of online resources as evolving, and explains the authoring opportunities and challenges it imposes. The notion of user time defines online

resources from the perspective of the readers, and in particular from the one of the scholarly audiences, as resources that either facilitate information search or reading. Scholars enter the resource with an objective that determines behaviours as well as temporal requirements and needs. The way user time is defined by both the reader and its interaction with the text and its spatial extension invites to analyse time and space in conjunction. But before doing so, the next section focus on spatial matters and how the notions of discourse space and the spatial extension of the text help define spatiality in online resources.

5.3 Online resources as spatial types

One of the points the literature review of this thesis makes is that a museum “constitutes a more or less well-defined spatial type” (Hillier and Tzortzi 2006, 282) questioning whether its digital derivatives, the online resources, are well-defined types. The two main types of online resources, online exhibitions and publications, use three-dimensional spaces as much as two-dimensional. Although online publications employ, generally, the two dimensions. The survey shows that very few museums use three-dimensional space in online resources despite their popularity (especially since the Google Art Project introduced them) and the attention museum studies literature gives to it. The very few cases that employ this spatial format incorporate a replica of the museum galleries in which the physical exhibition took place. Online visitors can wander through the galleries, look at the pieces exhibited, and sometimes access interpretive information on them. Research findings helps to understand the reasons why museum are not strong supporters of this model. Museum practitioner 4 argued:

I’m not a huge fan [...] because it’s too derivative, it’s too unoriginal. Here, the exhibition in which the museum spends a lot of psychological, intellectual energy on it [...] to make a website of it, the only way to do it is to make it look like that, and that’s not interesting because that’s costume (Museum practitioner 4 2016).

This quotation also tells that the practitioner believes that the three-dimensional spatial model corresponds to the online exhibition typology. Nevertheless, the practitioner doubts that a reproduction of an exhibition constitutes an exhibition in itself, calling into question the nature of the typology and its validity:

In my head the word exhibition is... there is no online definition of it. So even if you take an exhibition, which is a physical design of a specific space of any kind. [...] It’s really space you walk through where they make walls, and lighting, and everything [...] It highlights the idea they want you to walk through, that is a

physical experience. The online, it's not an exhibition it's an online presentation. [...] One thing is to say put the exhibition online but once it's online it's not an exhibition, it's just a reproduction (Museum practitioner 4)

If art museums have chosen not to replicate galleries spaces in online resources is because they aim to provide a genuinely digital experience and not to replicate the physical. But does the audience has the same opinion? Data from scholars reveals a more complex picture. Scholars like to have documentary evidence rendering the spatial configuration of exhibitions, although this evidence can be facilitated in formats other than the gallery replica:

What I miss in fact is to visualise the exhibition itself. If I could see it on a video it would be great because you get more context, the image is not giving you a partial image of how pieces are distributed, but a video gives you a more contextualised image of everything, the piece within the exhibition and the exhibition space (Scholar 15 2017).

Even though scholar participants admit that the spatial recreation of exhibitions does not effectively render the experience of being in the exhibition, it is still useful:

I guess for the exhibitions [...] I do like to have a sense of what the concept of that exhibition was and also what the experience of being there was to some extent. And I haven't really seen many websites that do that very well. I think sometimes it doesn't really work that well (Scholar 11 2016).

I really like the functionality of being able to [...] walk through the rooms [...] like on Facebook 360 degrees view, something like that. I think that could be really interesting in order [...] to see the exhibition for the first time. [...] There's always a difference between something on screen and being really there and standing in front of the artwork so it wouldn't replace anything (Scholar 19 2017).

In sum, the general consensus is that the gallery experience cannot be substituted. But at least for the audience, there is a value in rendering the spatial aspect of a physical exhibition in the related online resource. Efforts can be geared towards improving the reproduction of the gallery space, but these spaces may be just documented through photographs and videos. There exist several options for museums in this regard.

Museums have defined a digital spatial identity that goes beyond the gallery replica. All types of online resources use interfaces with a design that do not differ from the ones used in any

other Web page. One of the interview questions posed to practitioners was on the sources for inspiration for their online resources. Their answers to the question revealed what types of media and/or practices are the points of reference for museums. Two practitioners refer to digital journalism, and in particular one specific newspaper, The New York Times, as a key source for inspiration. The American newspaper's most recognised contributions to digital journalism which have inspired museums' online resources are the development of parallax scrolling based narratives. These were initiated with the long form story *Snowfall. The avalanche at Tunnel Creek* (2012).

The other interviewed practitioners pointed to other museums as their sources for inspiration. This means that if certain institutions adopt a certain model, other institutions may follow it. For example, not only the online resources studied but several other museums have implemented a parallax scrolling model that mirrors the New York Times' long form storytelling to their online resources—as mentioned in the literature review (Birchall and Faherty 2016). On this point, practitioner number eight highlighted the fact that to an extent museums have to provide recognisable interfaces and layouts to the audience:

I think the idea is that everyone should go into the same direction so users recognise you, right? When [the user] sees a certain type of content and a certain Web page [...], this is clearly a format that he recognises because other museums are telling the story in the same way. It should be that way. [...] That's why we don't try to come up with things that end up being too different. That's why if you are used to, let's say, buy a plane ticket or order food on the internet you need to work with standards. And if you find a website with a completely different style it doesn't make sense. We should aim to be a bit standardised in that regard (Museum practitioner 7 2016).

This opinion suggests that if an online resource is not identified with a familiar form may frustrate or confuse the user. Therefore, if a good number of museums are using the same interfaces in their online resources, users are more likely to feel at their ease during the online visit.

In ending this section, whether online resources feature a well defined spatial type is still under interrogation. Research results provide arguments to affirm that museums are seeking a recognisable spatial type. Museums reject replicas and aim for online resources with inherently digital spatial qualities. According to the research, the challenge is introducing new spatial types and standards to audiences that might or might not identify these new interfaces with a characteristic type.

5.3 The boundaries of the text. Embedded and non-embedded resources

Online exhibitions and publications are considered individual narratives that focus on a specific story from the vast number of stories a museum contains. This creates a relation of codependency between the museum and the narrative, and between the museum website and the online resource. Defining online resources as narratives requires a further analysis of this interrelation. Art museums' websites host online resources in their main websites in several ways. This parameter was used to study online resources in the survey and select the final six for further study. One realises that museums either create online resources as independent websites, or integrate them in the main museum website. The narratological concept of *spatial extension of the text* (Ryan 2014), paired with the idea of *intertextuality* (Kristeva 1980; Moraru 2005), supports the analysis of online resources in this regard. Research data provides a wealth of material that explains how the intertextuality of online resources—understood as the presence of a text into another and the relationships that are established between the texts—is determined by the spatial boundaries of the text. This has implications in authorship and readership, and presents advantages and disadvantages to the way narratives are produced and interpreted.

From the museum practitioner's perspective, research findings show that when museums envision online resources it is because they see the necessity of focusing on particular stories from the collection:

For example, a lot of museums tend to think [that] if you have a collection online then you're done, this is. Our whole collection is online, that's a big achievement but there is no context, [...] you're not telling people how to look at it. And I think when I, as a regular visitor, come to the [...] website and see we have 400.000 records I don't care. Where do I start? What should I start with? What is interesting? So I think it's a combination [...] This has to be done really, really well [the database] but then you need to have that additional layer of interpretation (Museum practitioner 4 2016).

Since the [...] museum collection encompasses narratives from different artworks which have an interconnection [...], the microsites help us a lot to contextualise (Museum practitioner 7 2016).

Moreover, a reason to develop a separate site is that the interface of the main museum website, or the collection database itself, are not flexible enough to tell certain stories:

We create that microsite which is much more flexible [than the main collection website] and brings the user closer to the collection (Museum practitioner 7 2016).

The microsite approach creates separate islands of content and a constellation of narratives around the museum. Yet, it still allows museums to create connections between the online resource and the main museum collection website. The objects featured in the online resource narrative are linked to the main collection database establishing an intertextual connection between the separate websites.

In some cases, institutions choose to integrate this content in the main website. The online resource becomes just one more section of the main website and presents a similar interface. For good or bad, this is something that limits the design choices and overall structure of the resource:

This project [...] needed to seat on the [museum] website, and the [...] website was designed [...] according to very very fixed templates and using a content management system which is very complicated and takes time. So what we did had to fit within the structure of that existing template and we wouldn't have chosen to do it necessarily in that way, but in order to make it happen that was absolutely essential. And we didn't have very much time and we also, as is often the case in these projects, we had a fixed amount of money (Museum practitioner 3 2016).

This responds to various institutional dynamics, including funding provision. But according to literature, if museums embed their resources is also due to a practical reason: to favour their discoverability. As literature suggests, when embedding the online resource on the main website, museums hope to increase discoverability (J Paul Getty Trust 2017). However, this makes difficult for the audience to establish the boundaries of the resource (Mann 2016), and consequently, of the narrative text itself. This issue was confirmed by the responses of scholar participants during think-aloud protocol sessions. When participants were asked to start navigating the resource, they would sometimes move into other sections of the museum website, or get lured by the main website content—in which case, they were consciously redirected into the online resource. In addition to this, scholars tried to search for information, using the search bar. This caused confusion since the search results they obtained were relative to the whole museum collection, and not limited to the online resource as they were expecting:

You know what's interesting here? Because I was looking at [the catalogue], and then I click on search and then they have... I would have expected that they would

have the search framed within the [catalogue], so I would have a look at what they have there, but I guess they don't (Scholar 13 2016).

The highly intertextual nature of embedded online resources is detrimental to the cohesiveness of the narrative. This has also strong implications in terms of usability. To an extent, the interaction users have the text cannot be controlled and users even expect to be able to navigate across resources. While the above issues did not occur in microsites, scholars very often used the links to the main collection website:

I would follow up on the actual works and try to find [...] a more detailed record about the works like this one for example. I don't know if this is what this link does (Scholar 11 2016).

It can be concluded that both models present some narrative advantages and disadvantages with clear implications in usability. While embedded online resources favour narrative cohesion and discoverability, the microsite online resource is more distinctive and clearly sets out the scope of the narrative.

5.3 Typologies and mediality. Online exhibitions and online publications

Although according to the main three semiotic media families art museums are multimedia, exhibitions are predominantly visual, and publications verbal. By the same token, online resources are undoubtedly multimedia. Determining whether an online resource can be considered one of the two typologies here at stake, depends on whether the resource is more visual than verbal, and vice versa. Yet, interestingly, research data validates this argument only partially.

In establishing the media configuration of online resources, the analysis of spatial matters is of enormous importance. Simply put, if a medium is more prevalent than another in a narrative is because it occupies more space in it. Generally, if an online resource is considered an online exhibition is because the visual prevails over the textual. The primacy of the images and the overall design of the layout would determine this typology. When visuality and images are highlighted scholars identified the resource as an online exhibition:

I guess it's a bit more like an exhibition, maybe because it is highly visual (Scholar 1 2017).

It was kind of like an exhibition [be]cause you did get to go through the images (Scholar 14 2016).

This other one reminds me more of an exhibition, there is much more visual, the image is much bigger, [...] you can see everything more carefully, and I just thought the way in which this is designed [...] it seems like they really want to make you want to look (Scholar 13 2016).

An exhibition uses a minimal amount of text compared to an exhibition, limited to object labels and wall texts. Therefore, if an online resource has a small amount of informational text can be regarded as an exhibition. Scholar 2 describes the experience in the following way:

This one is more an exhibition, because prominently is focusing on the images. [...] It's not particularly... is not really giving you lots and lots of information, what is trying is to... it's not like an art historical project, is more about looking, an engagement with this kind of project, so it looks more like an exhibition (Scholar 2 2016). I believe that a website is always going to give you more information than the exhibition, which has the labels in which information is limited. But all the information you can get from the website is fundamental. It helps you understand the exhibition much better. All the information of a website cannot fit in the museums walls (Scholar 15 2017).

Nevertheless, exceptions to this rule exist. In fact online resources with more visual than verbal elements in them could be also considered publications, they would correspond to a “glossy book”. Scholar 4 raises the matter: “You could imagine it as a glossy book with glossy images and captions at the bottom as a souvenir book” (Scholar 4 2016).

The amount of text, usually in the form of essays, in addition to specific paratextual elements such as bibliographic references, glossaries, indexes, footnotes, etc. can tell the audience whether an online resource is a publication. Most scholars identified online publications as print catalogues, the experience of browsing them is similar to the one of having a book or several volumes of books in their hands because the amount of text and the richness of textual content:

It could be a book basically if you take all the essays, it could be a publication (Scholar 19 2017).

It's a publication. It's more textual (Scholar 9 2016).

Because of the amount of detail and the cross referencing and back and forth, it would have to be a hell of a big book, like about 10 books (Scholar 10 2016).

I think is fairly... (reads aloud) “biography, works of art” [...] I guess my general thought is that sort of really replicates the same sort of idea of a printed catalogue (Scholar 14 2016).

Additionally, when an online resource is deemed a publication is because images in them are small—something that also leads to disappointment—and have an illustrative function:

When you click on this picture and the first thing I think is that is so small. [...] It means that the details are going rendered quite flat for me. [...] There is the description excerpt also, what the size is. But there is no additional help to visualise that, and that’s much more comparable to the sort of a print catalogue also where we’re getting a small picture, especially if it’s an old school printed catalogue and so the details are flattened (Scholar 8 2016). The second one is much more like a publication, absolutely. So this comes to that kind of tendency that pages, and the themes, they way the work is an illustration because of the kind of... rather than driving force they are illustrations of an art historical text but it’s definitely a publication (Scholar 2 2016).

An increasing number of online resources display large illustrations of the artworks. One of the main advantages online publications offer over print ones is that the images of the artworks in them can be larger than in print books. Confirming the obvious, the research results show that when this feature is used by online resources, scholars perceive them positively:

The image is better [...] you can zoom it. This is good. This is a very high quality image, that’s nice. In a book you would have to have multiple details to capture this longer size and very often they give wouldn’t give the detail you want, here you can actually move it around. This might save me a trip to a museum (Scholar 13 2016).

In this way, images in publications abandon the paratextual function that denotes illustrations and achieve a more balanced interplay with the text, “synchronising” text and image (Ballon and Westerman 2006).

On the one hand, empirical evidence shows that there still exist strong conventions around online resources typologies reinforcing the idea of the online exhibition as predominantly visual and the online publication as predominantly textual. On the other hand, these conventions are rejected by the same evidence, responding affirmatively to the question Chapter 2 ask on whether there is a false dichotomy between the online exhibitions and online

publications. What this suggests is that although typologies are becoming more and more imprecise, certain conventions are still valid among practitioners and audience. Nevertheless, the results of the present research should set the basis for an alternative understanding of online resources beyond the two typologies.

5.3 The visual and the verbal in online resources

Beyond the distinction of typologies, the research offers additional insights that enrich the long-held debate on *images and text* that the literature review exposed. Stating the obvious, art history, the discipline that frames art museums' narratives, could not exist without images. Images have a capital importance in art museums' narratives. Data from participant scholars shows that when reading an online resource, their attention goes to the images in the first place:

I think I'm giving way more attention to the images [...] I'm always focusing on images so [...] it's always the first I notice. [...] I look at an image and then I go back to the text to see what it says (Scholar 19 2017).

Yet, other participants do the opposite:

I tend to read the text first and then look at the image and I find, I personally get a lot more information from the text than from the images (Scholar 18 2016).

Some participants appreciate succinct texts besides images that online resources for general audiences have:

Not a lot of text which is also kind of nice (Scholar 14 2016).

It's not like an overload of information either, it's like a tease, like it shows me enough to let whether this is my thing if I'm interested (Scholar 8 2016).

But others, especially when commenting on general audience oriented resources, expect to find more written information:

I wish there was text here (Scholar 6 2016).

Honestly, this is very visually compelling, but a very small amount of text (Scholar 7 2016).

I hate to say this, as an art historian all we study image culture, but I think sometimes museums do focus too much on have [...] all the website material on images and sometimes people do want more actual information. Maybe you don't have to put it directly a ton here, and this is an OK amount, I think, to give as a general overview, but it should be maybe some links to some more in depth sources or something if someone wants to read a little bit deeper (Scholar 12 2016).

Online resources in which written text predominates and images are secondary and small also disappoint scholars:

If you don't have a good image associated to textual content, the value it's pretty small unfortunately (Scholar 16 2016).

I'm looking [...] at the cropped image which is static, which is tiny, and there are no dimensions on the caption that they've got and it's [...] kind of undermining what they're trying to do (Scholar 2 2016).

What this is constantly doing is inviting me to have a relationship with the text rather than inviting me to have a relationship with the work and [...] One of the things that are so wonderful about paintings is the luminosity of the colour and that's incredibly beautiful and it's that which captivates the audience and the imagination. So this is kind of putting all at a distance which is a real shame (Scholar 2 2016).

Striking the right balance between the verbal and the visual in online resources is an outstanding issue according to the research results. But this is an issue that pertains to scholarly discourses and online publications more than to general audience ones. Indeed, literature points to the need of making scholarly publications and resources more visual and to achieve the synchrony of images with written texts in them (Ballon and Westerman 2006; Rhyne 2013). Museums have made substantial progress in this regard but professionals interviewed think there is still room for development:

It could be much more visual. And really to be image led, and image driven, and that also fits so much with wider popular culture and that everything we do, is really more image led than ever before and I really feel like that's something that could be. That's a great development for the future (Museum practitioner 3 2016).

This is clearly an issue to be tackled and an objective to be reached by museums. The question remains how this could be done? Authors of online resources should interrogate the role of

images in narratives and ask: are images illustrations of the verbal component of the narrative or independent texts instead? Is the illustrative function of images being achieved? Paratextual theory offers a starting point to reconsider the interplay between images and text. Illustrations are paratexts, which considered as visual “productions”, that either reinforce or accompany a text (Genette 1991). Together texts and images produce “a mutual reinforcement” (Baetens 2003). The above quotations from participants suggest that this mutual reinforcement can be at risk when illustrations are not large enough to support the written text. And even though the digital medium is much more flexible and accommodates larger illustrations and allow overlaps between layers of text and images, there exists a risk of enlarging images to the point that they are separated from the text and their illustrative function is removed, disrupting the reading experience (Grant 2014). A simple example of this is when images are viewed in a separate window of the browser and the reader cannot find the written information relative to it or thinks there is no information about the image:

I doesn't look like they give you any information about [the image] like what does it tell you? cause I would be interested in that the most. Obviously you can see [the image] but, I think, an explanation, the fact that you put the analytical data up there even, because most people know a little bit, I see that would be important as well (Scholar 18 2016).

This poses a challenge for interface designers of online resources and invites to further research the interplay between images and text in order to achieve the sought-after synchronisation between the verbal and the visual art history seeks.

5.3 The focus of spatial attention. Images and the interface

In contrast with museum studies text, the photographic reproduction of artworks in online resources receives the extensive attention of museum professionals and scholarly audience as research findings illustrate. This subject is only superficially addressed by authors concerned with museums' digital narratives who are interested in how to integrate and format images as illustrations of written text (Grant 2014). Following Lessing's principle that images are by definition spatial (Lessing 1984 [1836]), their format and presentation are examined from a spatial perspective. The narratological term *discourse space*, understood as a frame that delimits the story or real space (Chatman 1978, 96) and a focus of spatial attention (Chatman 1978, 102), is used here to interpret research findings and establish the spatial parameters museums use to represent artworks in digital narratives. These parameters, that Chatman applies to cinema, can be used with other visual media. Chatman differentiates scale or size,

contour, texture, density, position, and clarity or degree of optical resolution (1978, 96-97).

Art museums use these spatial parameters in a discursive way in exhibitions and publications. For instance when a photograph of a sculpture is made smaller, when they provide an unusual view of it using illumination that highlights certain shapes and textures, manipulates its position, and focus on microscopic details of it in order to convey a perspective on the story of the object. The use of photography in online resources equates the spatial dynamics that the hanging of artworks, vitrines, or illumination frame in galleries. Photographic technique is consciously used in online resources to convey authors' discourse. A discourse, which as this quotation suggests, favours a certain view on the object, the one of the curators:

All our images are also edited along with the text, to make sure it's the most beautiful image and we work with the curators to identify specific details they would like to highlight (Museum practitioner 4 2016).

Photography sometimes is used with the goal of providing a clean and objective representation of the object. The artistic object is represented from all possible angles, remaking its physicality:

You see that physicality that's back. That's where you understand that this is a three-dimensional object [...] That's where you see the history of [it], where [is] the stamp, [...] most of [...] the provenance. A lot of the historical material [...] is in fact on the back of the object (Museum practitioner 1 2016).

But even in this photographic approach there is a degree of authority. These kinds of artwork images tell a story of the object in a certain way, that is very different from the one of the museum itself. In museums, visitors cannot see the backs of the objects, this is a privilege curators, conservators, and sometimes researchers, have. While this speaks about access, the museum is also making a statement and is providing a representation of the artworks in a way that only specialised audience would fully comprehend and benefit from.

Data from think-aloud protocol sessions prove that scholars appreciate accuracy in photographic representations, as much as expose how Chatman's spatial parameters apply to images in online resources. Intentionally or unintentionally, the way in which museums utilise these parameters has narrative implications. Starting with scale and degree of optical resolution, even in an age of communications with affordable travelling options and touring exhibits, it is not unusual to be surprised by being in front of the artwork for the first time and puzzled by its actual dimensions. The fact that the artwork scale must be modified in order to fit into a web page template causes some interpretive problems. This is a common issue in

print publications as well. In them, photographs of artworks are substantially smaller than the original and do not show all the details. Participant scholars pointed to their struggles when they tried to understand the actual dimensions of works of art in online resources:

I guess the thing that I'm missing with this, which is the thing that I miss with a lot of reproductions, is this kind of sense of scale (Scholar 2 2016).

The kind of totality of an object measurement at relative scale is something that we don't do enough on the web and I think it blurs it to a certain amount the understanding of objects, which doesn't happen when you go in a museum (Scholar 6 2016).

There is a problem with publications in which you don't know the real size of a painting and then you visit the real thing and you are surprised because it's very different. Publications offer you many details of the painting but being in front of it is very different (Scholar 9 2016).

The scale of an object image can be manipulated to enlarge it as well as to reduce it. Both options affect the perception of the object:

I'm actually thinking about it.. it's like I think more places should have like relative sizes, cause that's always a problem with art historians. It's like I don't know how to how big this painting I can blow it up as big as I want, so how is it relatively to the other one (Scholar 19 2016).

But the possibility of enlarging the object picture, made possible by augmenting the resolution of the image, is generally received positively:

As far I remember this is quite small. It's good to look at it closer (Scholar 7 2016).

It gets focused on a way you can get a lot closer than you actually would in a museum, where you are not supposed to mean up on things. and you can zoom as much as you want to actually look and look and not be in anyone's way (Scholar 18 2016).

I like this, that you can resize things (Scholar 12 2016).

I can zoom in, and I can zoom out. I'm kind of grappling around, figuring out what I can do with it (Scholar 8 2016).

It's really nice that they have images, some of these are just so amazing, this is better than seeing the painting in the original, unless you're standing there in the conservators laboratory which never happens (Scholar 19 2016).

From these quotations, one infers that re-scaling object images puts at risk the understanding of certain aspects of the object while it enhances others. It should be highlighted, that although this issue has not been addressed by accounts on the idea of museums as narratives, it is not new at all. One of the most frequently cited texts in digital museology literature, Malraux's "Museum without Walls", anticipates the effects of photography in redimensioning objects. He realised that the full scale of objects can be lost as much as their details gain new significance:

As a result of photographic juggling with the dimensions of works of art, the miniature (like small-scale carving) is by way of acquiring a new significance. Reproduced "natural size" on the page, it occupies about the same space as a "reduced" picture (1954, 30).

Malraux conception, together with research findings, ask from art museums more sensibility towards representing the scale of objects in online resources. Among the online resources studied on this research, the *Online Editions* of the National Gallery of Art employ a rule that the user can manipulate to measure the paintings while browsing their high resolution images. Additional ways to visualise dimensions can be found in other art historical resources such as the *Waddesdon Bequest explorer* (n.d.) of the British Museum in which each object is compared with the dimensions of a tennis ball through graphic means; or the more traditional gallery view, resembling a gallery wall, available at The Leiden Collection online catalogue (2016).

The notion of discourse space understood as a framed area to which the audience attention is directed (Chatman 1978, 96) is easily related to the action of framing a painting in a museum, as well as to the action of cropping an image of an artwork for a publication. Cropping images can also highlight a portion of an image, when that detail is brought to attention is re-scaled and redimensioned. The very action of cropping is subtly present in most artworks reproductions. A canvas, a panel, or a work on paper, might has no exact geometrical dimensions but an irregular contour which at times end up being cut out from the final image which one find on a given website. The absence of such practice, the act of uncropping, does not go unnoticed by some of the participant scholars when they visit one of the online resources, *Object:Photo* (see figure 5.1) in which photographs edges, supports, and other "imperfections" are not removed from the reproduction: "I can actually see the full print [...] like what the paper edges look like, what's passed this edge" (Scholar 6 2016). The decision of providing an image that preserves these material elements, as opposed to a "clean"

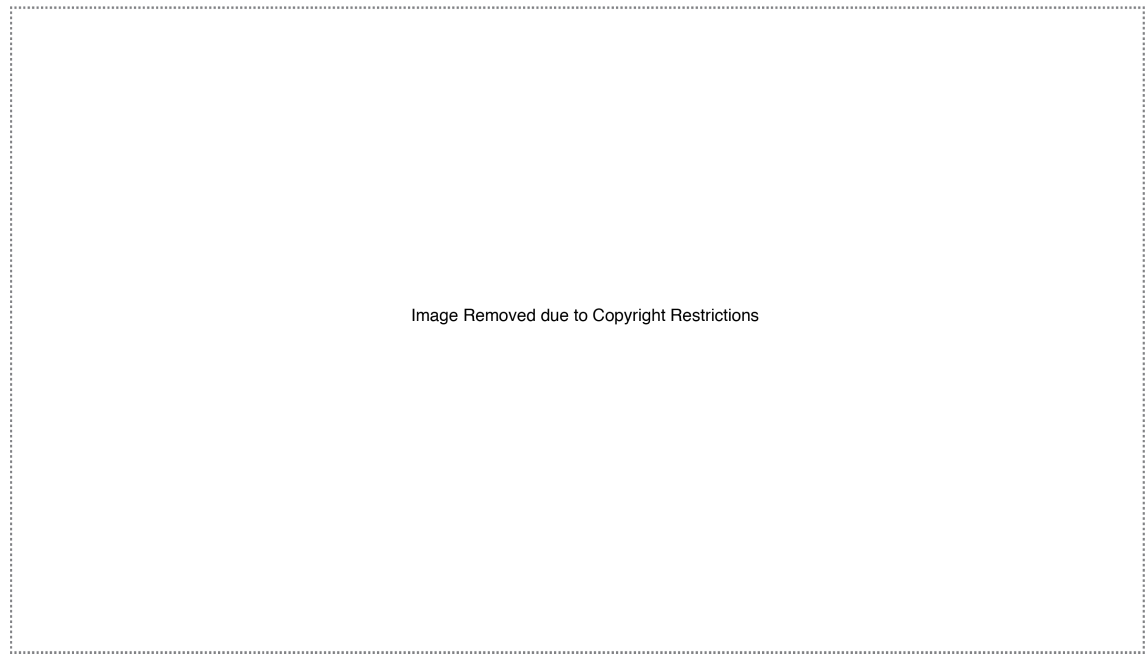


Figure 5.1: Screen capture of an object page *Object: Photo. Object: Photo*. 2014. Museum of Modern Art. <https://www.moma.org/interactives/objectphoto/>

reproduction, has an impact in how the integrity of the artworks' materiality is translated to a digital format. Moreover, it should not be forgotten that from a narrative viewpoint the material integrity of an artwork reproduction tells the viewer the material story of that object.

As said, the cropping of artworks images is deliberately used to convey meanings and direct viewers' attention to the points the author wants to make. The use of high resolution imaging techniques to generate visual narratives that move viewers through the space of a painting is gaining popularity among museums, as some experiments with high resolution imaging led storytelling show (Roddis 2018). This practice is present in the online resources studied in this research. While the National Gallery of Art's *Online Editions* and the National Gallery's *Building the Picture* use cropped details of paintings as illustrations of essays, *82nd & Fifth* (see Figure 5.2) and *Scrollytelling* (Figure 5.3) generate visual narratives based on closeups on paintings' details which are described by captions or a recorded voice. The verbal narrative, either in audio or written form, guides the reader through the details of the artwork. The cropping and close ups serve to different narrative purposes. In the first online resource, the artwork is approached from the point of view of a curator who directs the audience through a narrative and the details of the objects. Details of artworks are also used on the home page as means to lure the audience into the different chapters of the narrative. The second resource uses a similar approach, there is a narration that guides the reader through the saturate iconography of the paintings focusing on specific details of them. The conscious cropping of images is something participant scholars appreciate from an aesthetic viewpoint: "I love seeing the images, I like the way they are cut out sometimes, it makes people notice the images"

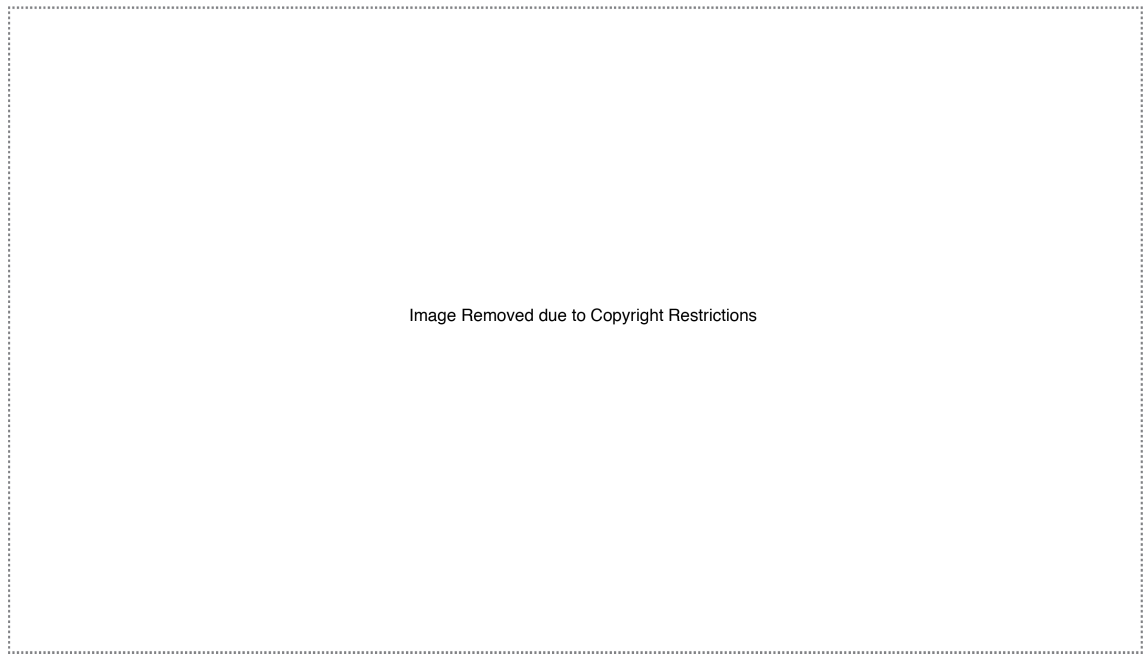


Figure 5.2: Detail of interactive captions. *82nd & Fifth*. 2013. Visited on 10/13/2017. <https://82nd-and-fifth.metmuseum.org/>

(Scholar 19 2016); as well as from a functional one. As scholar 11 remarks in relation to the details and iconography highlighted by the functionality: “This is the kind of thing that would be interesting for my students because they would ask questions like what this means. So this is kind of helpful in a certain sense” (Scholar 11 2016).

But scholars question how images have been cropped and appreciate having the agency of choosing the details they want to focus on:

This image is squared, but that’s tall and is getting cropped (Scholar 6 2016).

When you see this panel you look around to make sure you have seen all those scenes. If I could, I would like to move all around the painting, because this is a huge painting. Be able to somehow... if you wanted to see what is that painting what does it go (Scholar 19 2016).

This is quite useful but I’m a bit offended by being right in the middle of the picture (Scholar 10 2016).

It’s a very lovely detail and they are cutting out the details to make it clear but perhaps they should be showing them within the whole picture as well. Thinking about it, I would like the whole picture there, and because you would wander over picking up the details and the explanations. Say you’re making the decision, or feel like you’re making the decision (Scholar 10 2016).

I would actually like a fuller image as well, maybe in the corner or something like



Figure 5.3: Detail of interactive captions. *Scrollytelling*. 2016. Museo Nacional del Prado. <https://www.museodelprado.es/en/whats-on/exhibition/bosch-the-5th-centenary-exhibition/f049c260-888a-4ff1-8911-b320f587324a>

that (Scholar 5 2016).

These findings raise matters of authority and readership agency in relation to the current use of spatial parameter in general audience oriented online resources and its potential for scholarly purposes. If used for scholarly purposes, these imaging techniques should give more agency to the audience and invite them to make decisions on what fractions of the artwork they want to analyse.

So far, spatial parameters have addressed singular artworks but an artwork's position relative to another concerns discourse space. The connections between artworks that their display in museum walls creates and enhances have been the object of analysis in museum narrative texts (Bal 2001). Authors have celebrated the possibilities of photographic reproductions for juxtaposing and rearranging artworks (Malraux 1954; Warburg 2013-15). They envisaged what digital media could do in the years to come. In the same vein, research data proves that institutions take into consideration the affordances of digital media to spatially situating artworks together in online resources and expand what could be done in galleries and books:

You can put things side by side, or in a grouping that would require two hands and a book and lots of post its, and you still wouldn't be able to replicate that experience of seeing things together or having your own installation, or sort of objects that interest you. [...] If scholars do spread books out on a table and

compare the images [...] and spread everything out, and if you just have one screen or even a couple of screens you can really do that in the same way (Museum practitioner 2 2016).

Groupings of images in online resources, or the absence of those, elicited responses by the scholarly audience. Yet, these responses emphasise different effects and implications of artworks' juxtaposition that neither literature or data from museum professionals cover. On the one hand, one of the participant scholars points to the fact that museums' online resources often present singular images which has interpretive implications:

You can only see [...] one at the time, so your attention is parsing on singular images so the ability to think across them as a series is kind of removed (Scholar 2 2016).

On the other hand, several scholars focus on the interpretive benefits digital media offers as to visualise several objects. It makes possible to remove the contextual "distractions" that one might find in galleries:

I think maybe that helped more than if it were a variety of things in larger space, because it was a lot easier for me to draw a comparison consciously and unconsciously when everything is kind of concentrated and interwoven (Scholar 18 2016).

Being able to digitally arrange objects together also serves other analytical purposes. Reconstructing the original arrangement of artworks, as well as their locations when objects have been separated and are held by different institutions, is something scholars value, and demand from online resources when this possibility is not offered:

With the digital you can bring so many disparate things that are geographically... that actually are far apart together (Scholar 16 2016).

It would be good to maybe... because they tend to focus too much on their own collections, so if they have a bit more in terms of comparing a work in their collection to something else or reconstructions. [...] Where if they could show students how to reconstruct something or the entire piece to make them aware (Scholar 13 2016).

These quotations reinforce digital media affordances to de-contextualise and contextualise objects by either isolating them or assemble them with other objects. The implications of this

spatial capacity in the way narratives are told are variate. It allows for accurate descriptions of story time and space, and at the same time, fosters a kind of anachronic narrative connecting artworks that share themes, iconographic, and stylistic features.

Summing up the subsection, research results offer an extensive account on the visualisation and presentation and artworks from the perspective of narratology. The spatial affordances of digital media favour highly visual narratives that, advancing the capacities of the museum itself and photographic reproductions, present artworks under new lights, reframe, and recontextualise them.

5.3 Linearity and nonlinearity

This subsection is focused on the binary between linearity and nonlinearity in narratives. It is the closing part of the overall argument on temporality and spatiality because, as explained in the literature review, linearity and nonlinearity have to do with temporality as much as with spatiality. The following paragraphs examine existing types of linear and nonlinear structures in online resources and describe the characteristics and implications each type has. The six online resources studied in this research present variations of linear and nonlinear structures. In short, single paged resources are linear, and multipage online resources are clearly nonlinear. However, even nonlinear resources provide some room to linearity in their navigational structures. In order to further analyse linearity and nonlinearity the work of Marie Laure Ryan on the diagramming of narratives (2007; 2014) is here used to plot out the skeleton that defines the structure of online resources. As she points out, diagrams can be used as tools for narrative analysis. Several authors have applied diagrams to the study of diverse narrative elements such as plots, chronology, and space (Ryan 2007), but Ryan identifies a specific graph, the tree diagram, as the representation of websites structures:

Another frequent use of trees in digital texts is the structure of a typical website: the home page, or entry point, functions as the root, while the various choices on the menu displayed on the home page correspond to the branches. The tree structure may, however, only appear on the level of the relation between the home page and its immediate children pages: when the original menu remains available after the user has made a choice, this means that the children are interlinked by a network (Ryan 2014, 240).

Ryan's tree diagram model can be clearly identified with the six studied online resources, although each online resource presents a small variation of the model that goes from more networked and nonlinear to less networked and linear. The four multi-page resources provide

entry points from the home page to the “branches” of the site, but not all of them make available the different branches on a menu once the user has accessed a branch. *Object:Photo* displays a top menu that makes available all “branches” of the site on every page visited and offers additional network links between pages. In *82nd & Fifth* once the user is in one of the objects pages there is not link to other objects, and in to see another object the user needs to click on the menu and select an object from a group of them. At the National Gallery of Art’s *Online editions* home page the users can find links to the multiple branches containing objects’ pages. In them, when a user is visiting an object page can click on the links to other objects, although is unable to access a whole list of objects unless s/he returns to the home page. Lastly, in *Building the Picture* the resource offers a home page in which all branches are shown. When a user is in one of the branches is offered a link at the bottom of the page to proceed to the next piece of content in a linear way. This last online resource is the one that clearly combines nonlinearity with nonlinear preserving in a way the codex book structure. The two single paged online resources, *Scrollytelling* (see Fig. 5.4) and *Featured Artwork*, are clearly linear, have a beginning and an end, and only offer a small number of hyperlinks to the museum main website pages that would move the reader away from the linear story.



Figure 5.4: Screen capture of *Scrollytelling*. 2016. Museo Nacional del Prado.
<https://www.museodelprado.es/en/whats-on/exhibition/bosch-the-5th-centenary-exhibition/f049c260-888a-4ff1-8911-b320f587324a>

Digital media is considered by definition nonlinear. The hypertextual nonlinearity that museums’ online resources feature has been inherited from museums’ displays in galleries and books. The assertion the literature review makes, is reinforced by the data from the scholarly audience. Hypertextual navigation in online resources reminds the audience of the interactions performed when visiting an exhibition and reading a publication. The same online resource

would remind one participant of the gallery space while a different participant would think about the turning of pages. For instance, participant scholars link hypertextual navigation with the experience of making connections between artworks in physical galleries:

I think it's more like an exhibition because [...] you have the freedom to think about things in different ways. And to control the content and somehow to be able to walk into the gallery and [...] you can stand in the middle and you can see a photograph on that wall, and see one, maybe around the corner in the other gallery, and you might, then in your brain just be able to make those connections because you're in the space (Scholar 12 2016).

If you suddenly want to compare three different artists you have to run between rooms (Scholar 5 2016).

Yet, according to scholar number five, the same kind of hypertextual navigation and connections between works of art can be achieved with a publication though “you have to be flipping back and forth” pages of the book (Scholar 5 2016). Nevertheless, it should not be forgotten that the codex book and other print publications are generally considered to be linear and this linearity is identified with the publication model tool: “When we read a newspaper we usually read from top to bottom and then from left to right, so I believe this has been conceived as a text on paper” (Scholar 15 2017). Nevertheless, one idea is clear: the hypertext helps to establish connections between artworks, artists, or ideas easier and quicker than it would be in an exhibition or print catalogue. It enhances and multiplies the qualities of nonlinear narratives. Linearity however does also present some narrative advantages, such as cohesiveness and clarity. The above quotations also suggest that there does not exist a difference between the online exhibition and online publication based on the dichotomy of linearity and nonlinearity.

Whether a museum develops an online resource that is linear or nonlinear depends as well on the characteristics of the story that is being told with it. The medium here reinforces the story. An institution chooses to tell a linear narrative because the story has certain characteristics, like being compact and focused:

A parallax design [...] enables a more guided navigation. I mean, instead of seeing like a mosaic and clicking on it, this one, tells you [the story] as you scroll and the content appears. And this idea works well with an artwork from the collection because with an exhibition it could be extremely complex, it would be overwhelming.[...] It's a story in which content gradually appears. [...] We choose pretty well the order of what is being told, we go to the more general to the

particular. [...] [It] goes more in detail. It tells you this, this, and this (Museum practitioner 7 2016).

Simplicity is a characteristic of linear narratives. This characteristic is expanded to features of the interface and devices utilised to access it:

It can be used with mobile phones and on the web. Before the navigation was structured through a menu, and scrolling is easier than clicking. [...] It's a matter of usability, it's easier, then you design content that falls like a roller blind which is easy to consume. [...] It also allows us to provide content in a more approachable and direct way, more than with a catalogue, obviously. [...] If you look at our web [...] it was conceived to work with long webpages with a lot of scrolling. Why we did this? Because we realised that using the scroll is better than using a website with menu navigation which is confusing and users get lost (Museum practitioner 6 2016).

From these responses one infers that nonlinear navigation complexity leads to disorientation—a fact that the following paragraphs will discuss. But, as the above excerpts from the scholarly audience stated, nonlinearity has different qualities, it allows the reader to make connections between elements of the story. Museum professionals consciously implement nonlinear navigation when the story to be told requires such treatment due to its complexity:

So a book or an exhibition for the most part has an ordering in which you view it, or sequence such... you view things on a wall or turn the pages and a book. And obviously you can pick up a book and open it into the middle, but the structure of a book is fundamentally linear. Online we went to great links to create a nonlinear message a non linear narrative to decide as a whole into the way we structured the site (Museum practitioner 1 2016).

As previously said, the nonlinear pathways outlined by hypertexts put the narrativity of online resources at risk. Fixed sequences, clear beginnings and endings, magnitude, and wholeness of a narrative, are all of them characteristics that Landow (2006, 218) considers to be at risk in digital narratives. Think-aloud sessions data demonstrate what specific issues are found online resources narratives. There exists a connection between the navigation and the completeness of an online resource which converses with HCI approaches that use narratives as a method to assess usability (Brejcha 2015). As Brejcha explains, this approach understands the argument presented in a multi-page website as a global narrative with which a user interacts:

The global narration is supported by the navigation and interaction component running through a sequence of screens. These elements do not perceptually appear in some static form, but are enacted through the user's activities with the computer (Brejcha 2015, 36-37).

This method can help evaluate the flow of navigation of an online resource and whether users are able to reach all its parts or these remain hidden to them. Johanna Drucker explains that "we make sense of one piece of information or experience in relation to another, stitching fragments of what are graphically related elements together into a narrative" (2011, 4). In joining pieces of a written narrative together, readers are assisted by paratexts that include typography, paper, the layout of a page. These paratexts in digital media comprise as well interfaces and menus (Strehovec 2014). When navigating an online resource, paratextual elements are the "elements" users enact:

[N]ew media paratexts are also important in the form of menus and instructions that facilitate orientation and progress in traversing the e-text scape, which means that they are also essential for navigating and controlling the literary text (Strehovec 2014).

This quotation, although relative to literary works, summarises the relevance of menus, buttons, banners, and other orienting paratexts in websites. These paratextual elements operate at the level of *discourse space* and are spatially distributed in consonance with the text. The importance of these paratexts in art museums' online resources was revealed during the interaction of participants with multi-page online resources. One of the participant scholars describes the interaction with paratexts in the following way: "I can visualise the main website structure by looking at this. It explains what is all about, and this is going to tell you what the main sections would be" (Scholar 7 2016). Interestingly, most results concerning these orientational paratexts emerged when participants struggled with navigation. In these instances, participants expressed their intention to return to previous pages, yet, they could not perform the action or were hesitant about what their next action would prompt. Like a visitor in a museum who needs a map or to ask visitor service staff for hints, users of multi-page complex websites can feel disoriented. This was evident in participants' interactions:

Now I kind of I don't know where I am in the website and how I can get back to where I was before (Participant 7 2016) .

I didn't know how to get out of there (Scholar 7 2016).

So you can't get back to the essay [...] that's annoying, very annoying. If they are

talking about something in an essay and you want to look at it in more detail how do you do? (Scholar 4 2016)

It takes a little time to figure out that actually you don't have to go back that you have that side bar there (Scholar 17 2016).

How we're gonna get back? Let's get back to where we started (Scholar 19 2016).

The tree structure (Ryan 2014) in multi-page online resources often invites users to continue visiting "branches" but also to return to the home page. The online resources studied either present a breadcrumbs menu or regular menus to facilitate navigation back to the home page, yet these elements were ignored by participants. Often participants used the back button of the browser to return to the previous visited page: "then, to go back to where I was [...] I use the button, the back button" (Scholar 3 2016). In general, this action provided the expected result, although sometimes participants were frustrated because they could not return to the previously page visited. This issue denotes a need to improve overall navigation of online resources.

As previously said, menus, buttons, and hyperlinks are key elements used to advance navigation in online resources. If these elements are not positioned in the right place, are not noticeable, or confusing, participants struggle to make progress. During think-aloud sessions participants noted when they were unsure about how to obtain further information, and therefore progress in the narrative:

I'm missing something here that gives a bit more information (Scholar 13 2016).

I'm just wondering why this is hyperlinked, so I'm kind of curious about that (Scholar 16 2016).

I don't know if this is what this link does (Scholar 11 2016).

In these cases, hints were given to them in order to continue navigation. Participants were also hesitant about what kind of functions would be triggered when clicking on some hyperlinks or buttons. This is something that can prevent them from continuing reading as Scholar 11 explains:

I guess sometimes I can get frustrated pretty easily [...] if it's not clear what it's happening, where you go next, or something like that. I feel like I would stop looking at it, instead to try to spend a lot of time figuring out. Sometimes it's laid out in a confusing way. I don't understand where it's the space of it, like where it's the next part (Scholar 11 2016).

It is not unusual to find not well structured scholarly online resources, this requires an extra effort from scholars in terms of accessing it:

I always find in my experience with web pages and museums... if it's good information it doesn't matter what the structure is. You would probably go and try to get it because you have to (Scholar 16 2016).

Only very few participants provided specific reasons that explain why such issues would emerge during navigation. For example Scholar 18 clarifies: "It makes you, with these sorts of small links, I think, less likely to click on them because [...] it's going to be more details or information, and not anything interactive like this" (Scholar 18 2016). This shows that paratextual elements, namely the size and design choice of buttons and text fonts, determine whether users reach all contents of the online resource, and therefore construct a more or less complete narrative. "Missing", or instead, unveiling parts of a narrative changes users' perception of it.

Needless to say is that linear online resources did not present the above issues during think-aloud sessions. Linear online resources provided a more cohesive reading experience. Moreover, vertical scrolling is considered an "effortless" form of interaction (Bostock 2014) and the data from participants clearly confirms this idea:

I like it's one page and you just have to scroll down and [...] don't have to click too much. All the information is on this one website and you can [...] scroll through the images so it's really easy (Scholar 19 2017).

It's sensible in that [...] you scroll down and you come to new images and then new bits of information and the information is quite condensed (Scholar 1 2017).

I think a lot of people know about scrolling down [...] I think the actual design it's a little lovely (Scholar 10 2016).

This sort of intuitiveness, and also, like I said I liked the way that you can sort of wander around and scroll down, it was, in a sense... it felt that is much simpler (Scholar 17 2016).

I think this is very intuitive if you use the web [...] The scroll function was like I'm used to it, it really drives you through the site, so and it's quite clear how you navigate the site, so the clarity of it is quite good (Scholar 5 2016).

I'm scrolling, which is really nice (Scholar 2 2016).

Linearity and nonlinearity have an effect in user time too. Specific spatial features of interfaces invite to interaction at different speeds. Two of the six studied online resources use a clear

vertical parallax scrolling model, and another one uses vertical navigation only in some parts of the site. The scrolling interaction on these resources leads to slower-paced navigation. The data from participants reinforces some of the ideas introduced in literature, in particular that the scrolling interaction, slows down online visits (Birchall and Faherty 2016) imposing a certain discourse time. A participant explains “the information was presented in such a way to slow down enough while also scrolling through the art.” (Scholar 18 2016) Overall, linear interfaces suit the slow paced and detail oriented interactions required by close reading. However, because the participants of this research are scholars and their visits to art museums’ online resources are primarily motivated by research and teaching purposes, obtaining information rapidly is important. Their user time may be in conflict with the discourse time of the resource. Participants recognised the importance of time in their online visits and how online resources saves their time. The pressing need to get information makes vertical scrolling interfaces not the best suited for effective information search. Participant number twelve notices that this linear vertical model has a kind of structure:

Where you don’t get an overview of what you’re looking at [...] if you do research or trying to find a specific work [...] and maybe want to go back to find something you saw, it would be really difficult to do that, I think (Scholar 12 2016).

The same participant compares the linear vertical model with a more compact and traditional interface, where there is no necessity to scroll to see all contents, and points that in the second type of interface a user gets “this basic page and you can just look at it for a few minutes and then you can go further” (participant 12 2016). This argument is not completely new, and not so recent usability manuals share the same opinion. In fact, Nielsen (2000, 115) argues that vertical linear interfaces are not good for information search. This was also matter of concern during the transition from the scroll to the codex book. Crane states:

Even in manuscript form and before the development of settle conventions of running headers, standard page numbers, tables of contents, indices and other aids solidified in the age of print, books are far better suited to random access than scroll. It is hard to imagine that you could ever unroll a lengthy scroll as quickly as you can flip the pages of the codex (2003, 120).

According to research findings, the scrolling linear model, while praised by recent museum studies literature (Birchall and Faherty 2016), has also limitations. Museums should carefully consider those before embarking into the development of online resources whose audience is primarily scholarly and uses the resources to seek information.

Restating the obvious, online resources are linear and nonlinear. But beyond categorising online resources in terms of narrative linearity and nonlinearity, the results offer arguments that explain why museums choose an option over the other, and expose the implications of each one on the interactions with the narrative. Research makes a significant advancement with regards to the intersection between narratology and human computer interaction, and shows evidence of the contrasting effects of linearity and nonlinearity in scholars' reading activities.

5.4 Readership

5.4 Readership and interactivity

In principle, digital narratives give more agency to the reader. Their hypertextual nature define them as essentially interactive. The idea of interaction is strongly correlated to the processes of reconfiguration of authority museums are undergoing. The use of interactivity is widespread and common in museums, and as such, it is referenced and discussed by research data. Marie-Laure Ryan's "interactive onion" model (2011) serves to the identification of of interaction types in online museums' narratives. From the four types the literature review described, the studied online resources respond only to the first two types. Linear online resources, the ones that use vertical interfaces, lean towards the first type. In these resources readers click on parts of the text to obtain further details of the narrative, such as captions, images, videos. The reader is allowed to manipulate the interface to access content. The other online resources are undoubtedly hypertextual, and can be identified with the second type of interaction that affects the discourse and order of the narrative. The museum professionals interviewed described their experiences developing hypertextual resources emphasising how they allow readers to command the narrative. Professionals who have worked with print publications noticed the differences in terms of interaction between print and digital even more:

You do sacrifice a little bit of control in terms of how you lead your reader to information, well you sacrifice all the control actually because they can look at it in any way they want. They can put it in the context that you never imagined for it (Museum professional 5 2016).

The use of the hypertext in online resources lets readers shape the narrative, not only because they click on the links that take them to the parts they want to read, modifying the order of the narrative and crafting their own itinerary, but also they interrogate the database in which the hypertext is based through queries to then select relevant parts of the text:

The [...] integrated query models that we set up [...] each of those is designed [...] to present a set of ways to query or to ask questions about data in front of any various queries you do. You get a different set of conclusions that tell you real information, very concrete real information about that time period in art history (Museum professional 1 2016).

Hypertextual interaction has also consequences in meaning-making processes, it goes beyond the mere control of the narrative. A purpose of museums that employ the hypertext in its full capacity is to avoid presenting a statement in order to leave the reader “with more questions” (Museum professional 1 2016) so the reader can arrive to their own conclusions and interpretations. This hypertextual interaction model generally supports complex narratives. A reader might access the narrative from different angles and at different times, yet this narrative would probably not be the same. As one of the participant scholars mentions with regards to one of the online resources studied: “I’ve been to the site several times, and I always learnt something from this site” (Scholar 5 2016), this confirms the variability of hypertextual narratives. Although the hypertextual model of interaction gives freedom to the reader, it requires from the reader a purpose and an intellectual commitment to the narrative. A reader might not just click on random links or make pointless queries:

This is the sort of website where to express a view on its construction would itself be a significant task because you would need to address the website with some well found questions, and give the website time to demonstrate and enable you to assemble the answers (Scholar 3 2016). This one, you would probably have to spend half an hour so just to try to figure out exactly how all the different options work. It gives you a lot of freedom but whenever I need a website that gives you that kind of freedom you have to kind or learn how to use it, probably (Scholar 12 2016).

These excerpts speak as well about the identity of the reader and its background. Both of them matters that section 2.3.7 studied in-depth and a following section examines in relation to the research results. After all, the interaction the reader has with the narrative is determined by these factors. What paths the reader follows or what queries the reader makes depend on the reader’s curiosity, interests, and purpose to visit the resource.

It should be mentioned, that there are no examples of online resources that explore the two other types of interaction Ryan differentiates (2011)—the ones that would transform the reader into a character of the narratives. However, this should not exclude them from the potential options museums have. Several major art museums have developed video games for mobiles and consoles that explore that level of interaction, and develop immersive experiences for

on-site visits, yet in them, historical narration is secondary. A challenge for museums is in developing online resources that explore interaction even further.

5.4 Implied and real readerships. Art museums' online resources audience

During the process of creation of art museums' online resources, the authors have an implied or ideal reader in mind, yet, resources are accessed by real readers who might differ from the implied ones. The concepts of implied reader (Iser 1978), or ideal reader (Eco 1979), and real reader help to examine expectations and reality. What museums have anticipated and expect to achieve in terms of audience or readers, can either coincide or not with the real audience or readership responses to online resources. The museum' implied audience or readership is shaped according to both the perspectives of the institution and the audience. Museum studies text showed that museums gather information from real readers in order to create resources that meet their expectations and needs. Research data from museum professionals proves this, and one of them affirms: "All aspects of content that I think either our audience want online or we think they want online, or we think we need to do because we want to expand our audiences" (Museum practitioner 4 2016).

Online resources are produced by museums with the objective of reaching an even wider spectrum of their audience or readership. Museum practitioners agree on this fact: "They give us an opportunity to allow everybody, first of all everybody from wherever they are [...] to look at art history" (Museum professionals 2 and 5 2016). One of the greatest potentials of online resources is precisely accessibility. Museums envision narratives to be read and accessed by distant and diverse readers, yet, in practice, this is an aspect that needs to be perfected and for which museums do not have found a clear solution. Interviewees 2 and 5 propose to create "an aggregation" of online publications and similar online resources, because:

It is a little frustrating to have these things out there and have people not know that they're there. I think that's one thing here that it probably needs to be addressed a little better is this whole how can we make it easier to find this (Museum professionals 2 and 5 2016).

Once resources are finished and put online, studies to understand whether real readers access and utilise them are needed. In short, museums need to know whether resources are successful and audiences use them. This is an issue also connected to the temporality of the online resource. The interviews with practitioners reveal that current evaluation methods might be

insufficient:

Evaluating it, and for some reason doing something other than just than Google analytics, it hasn't happened here yet. And I guess that's because it requires money outside evaluation and because it's there, you think that things are ok, it's working. But I think evaluation it's really important and I think it's critical to have somebody involved in making sure that happens (Museum practitioner 5 2016).

The excerpt does not precise what type of evaluation museums would need—a matter that requires extensive discussion and falls outside this thesis objective. However, it pinpoints the fact that the implied reader concept is clearly incorporated into the construction of the online resource, but not the one of the real reader. The resource is developed for the ideal reader or audience, but once it is finished, there is not a deep analysis of how real readers or audience interact with it. The institution does not fully investigate how actual audience interact with the resource besides the quantitative information which can be inferred from Google Analytics reports.

Either within the main museum website or in the Internet, the audience has difficulties to discover the resources. This does not go unnoticed by the scholarly audience. Participant scholars pointed to this problem as sometimes they even were not aware of the existence of the resources they used during think-aloud protocols:

I think people sometimes [...] just don't know about them. They are not very visible in a lot of websites for some reason. I mean, look, the fact I didn't know about that one for example. [...] I don't know how to make them more visible (Scholar 11 2016).

I would say [...] it's probably getting the information out there that people can access these things. Because I was looking at your list and your list of exhibitions is huge and most of them I guarantee I've never heard of, but I can't tell you why I've never heard of them (Scholar 18 2016).

Nevertheless, online resources end up being discovered by relevant audiences. Although the processes and strategies in doing so are serendipitous. Additional participants noted this:

I still get surprises. The other day [...] I found something I didn't know. [...] Sometimes something appears, [a] huge amount of information I didn't know about and it's chance that I found it or somebody tells me, have you seen this? I got colleagues here. One colleague here and a couple elsewhere who with compare

information and what they are finding, resources of information. [...] I do a lot of just putting the authors name into Google, I do a lot of my research with Google and sometimes that turns out nice surprises. If it's nothing the sort of resource on Google at all. I think they are risking losing a lot of people (Scholar 10 2016).

Finding online resources is as well time consuming:

It currently takes a lot of time to find things. You basically have to... you can google by using certain words but also you do have to go around and visit the museum websites and look what they offer (Scholar 17 2016).

And it should not be forgotten that economic and linguistic barriers imposibilitate access to resources:

I would say, for audiences that don't have easy access to computers and the internet, with our socio economic [background] that seems impossible. But there're millions of people who would not have access if we don't take everything and put it online that's a problem (Scholar 14 2016).

Although in the end, the benefits of online resources in terms of access are uncontestable, as two additional participant scholars highlight:

It's just makes it so much easier to access (Scholar 2 2016)

Just more than easy access, you don't have to go to buy it or have to go to the museum, the store or to the library. So it's free (Scholar 14 2016).

How can online resources become more discoverable and visible to the audience for which they have been created for? This is an issue that several studies on online resources have raised (Mann 2016; Getty Foundation 2017). A repository, as museum practitioners 2 and 5 mention can partly solve this issue, however the fact that digital media is still gaining recognition among art history scholars requires other measures to tackle the problem. This is approached later in this subsection.

Online resources are catered to either a general audience or a scholarly audience, with some exceptions the section 2.2 of Chapter 2 discussed. In surveying online resources, the concept of implied audience has been used to classify online resources according to the two major groups: scholarly and general. And responding to the objectives of the research, three of the six selected online resources are examples of general audience online resources, and the other

three are scholarly ones. Literature has shown some controversial and contradictory perspectives on online resources. On the one hand, the emergence of sub disciplines such as digital art history gives an impulse to scholarly online resources in museums. On the other hand, the common belief that museums' online resources, and in particular certain types, namely online exhibitions, are used to instruct and entertain general audiences strongly persist. The following paragraphs interrogate the strong dichotomy of the general and scholarly audiences. Research data is rich and nuanced in this regard, it acknowledges as much as rejects the dichotomy. Museums professionals' interviews demonstrate that in online resources museums may address several segments of the audience and not only one. Data from scholars coincide with museums' professionals on this point. Moreover, scholars' data shows that general audience online resources can be relevant to them in specific contexts.

Beginning with the data from museum professionals, the telling of some of the interviewees who worked in scholarly resources reveal that at least two of the studied resources were designed for both researchers and students: "If we thought of any particular audience, we were thinking of the student audience, and we want this to be used by students and by researchers and we continue to do so" (Museum practitioner 3 2016). Additionally, educators were involved in the production of another resource. Something which proves that the authors' aim was to reach a wider audience not limited to scholars: "To some extent one of the educators wrote the overviews" (Museum professional 5 2016). Referring back to the literature reviewed, the two previous quotations bring up some of the issues there outlined. Research results fit into the discourses of authors that call into question the dichotomy between research and education and think online resources might respond to the needs of different audiences. A majority of museum studies texts picture online resources as either educational and primarily oriented to general audiences, or as scholarly and oriented to researchers. However, the above excerpts reinforce the idea that there exist multiple levels for which online resources are useful for—from primary school education to university and adult education, and research—despite several museum studies texts addressing educational and non educational online resources obviate the fact.

Participant scholars provide additional and substantial data to further scrutinise the dichotomies between scholarly and general audiences. Before beginning the think-aloud protocol sessions, participants were told that they would test one scholarly resource and one aimed to the general audience. And during the sessions, they confirmed whether resources were either aimed to scholars or a general audience:

It would be good for kind of general audience, I don't know, it's a little too simple for the classroom, for an academic audience (Scholar 5 2016).

I think for the general public there is enough information. For us [art historians]

you need to add more connections to content(Scholar 9 2016). You describe [the resource] as scholarly which I think it's absolutely correct (Scholar 18 2016).

Yet, responses were not always homogeneous. Interestingly, some of the deemed scholarly resources were considered suitable to the general public as well:

I think this website is good for both scholars and the general public because you can get a nice overview of things. But if you want you have this option to have essays to read and you don't have to read them but someone who is doing research might need that sort of information (Scholar 12 2016).

But the opposite rarely happens. Moreover the prejudices on the scholarly status of online resources are still present among scholarly audiences. One of the participants commented on the idea of museums' online resources not being "scholarly enough" reintroducing one of the debates present in section 2.2 of the literature review:

I think there is this sort of general perception within art history that these are like useless websites, that they're not scholarly enough, and they are too aimed to the general public just like basic information and they are not critical enough. [...] I think that's sort of [a] myth because you see a lot of them are very complicated and get a lot of good information (Scholar 12 2016).

This speaks about the degree of acceptance of digital media in academic circles. Whether scholars see the value of online resources and are knowledgeable about the content and scope of art museums' online resources, are issues the research data helps to discuss. When participant scholars were asked about what online resources they normally use, most of them reported museums' collection databases, online resources from art institutes and research centres, as well as digital versions of print journals sometimes in pdf format. Art museums online resources, such as the ones studied in this research are less common but not less useful. Undoubtedly, online resources, especially scholarly ones, are used by scholars to pursue research. However, one of the most interesting aspects of the data is how it highlights that online resources are used in teaching at university level. In the case of scholarly resources, those do not only serve as research tools but also to teach:

I'm glad they added this, this would be very useful for my students, to have this glossary (Scholar 14 2016).

When I assigned some reading for different sessions I prefer articles or books that are ebooks or ejournals.[...] But I would find actually [...] this type of thing in

many cases even better because of the quality of the images [...] sort of really emphasise that they look at the images and prepare not just by reading a text but looking at images for the next session or the seminar. So I think there's a lot of possibilities here from the point of teaching with this material (Scholar 17 2016).

And surprisingly some of the scholarly resources were considered more adequate to art history students, or someone with an advanced but not professional knowledge level, than to scholars:

I have to say this is a little strange because it's a bit too technical for a regular user, for someone who is interested in art, but it is not [...] enough for an art historian. It is like somewhere in between (Scholar 13 2016) .

Maybe it was too advanced for schools but certainly not [advanced] for an A level student (Scholar 4 2016).

Regarding general audience resources, unsurprisingly, most participants were uninterested on their contents and frustrated with the treatment of the texts. However, some other participants found that these resources' narratives and features were relevant to them or to their undergraduate students:

I think this is really lovely and one can spend a lot of time with this, even as a scholar. Because you said that this is more for the general public, but [...] I think is enticing and so that's how I feel. [...] You can do a lot with the digital material and then how to make it interesting so that people can get curious and want to experiment and explore without making it too sort of banal (Scholar 17 2016).

They give people, especially if you are like a student in art history... Let's say you are thinking of majoring in art history... They give you options on how you can approach a work of art, which [...] a lot of teachers have one way of approaching. They're stuck in one methodology [...] [Students] see different ways in which you can look at a work of art. You can look at [it] like in terms of the x ray, in its context, you can look at it in terms of technique, so it opens up your mind (Scholar 13 2016).

One participant also recognised that occasionally uses general audience resources in the class: "They are very experimental websites [...] I often sort of just give the students a link that they can explore because they made these animations about artworks and create them" (Scholar 17 2016). Once again, this evidence confirms that the purposes online resources are used for might be different that the ones museums envisioned for them. The approaches, visuality, and

experimentation museums deploy in their general audience online resources have an appeal for specialist audiences. Following Ballon and Westerman (2006) suggestion of learning from museums' education departments, the above excerpts invite to look closely at non scholarly online resources and adapt their features to scholars' needs, from research to university teaching.

The dichotomy between the general audience and the scholarly one should be also brought into the discussion on online resources typologies. The generalisation is that online exhibitions are educational resources for the general public, and online publications serve scholars. However, research data puts this idea under scrutiny. Most scholar participants admit that they visit online exhibitions before the visit or just as another research resource:

I would check the exhibition online before I actually go to see it (Scholar 13 2016).

When I wanna do research I would probably go online and visit the online exhibition because [...] it's more easy to handle research rather than wandering around the exhibition, even that's also an important part of it (Scholar 14 2016).

I tend to go to sites that I've seen the exhibition so it tends to be a complement to the exhibition (Scholar 5 2016).

I use every resource I can get, so definitely digital exhibitions and more things like that (Scholar 19 2016).

These views keep suggesting that art museums' online resources, regardless of their typologies, are valuable and relevant to multiple audiences at the same time. The dichotomy between scholarly and general audience is neither always accurate nor effective, and one of the participant scholars reiterates this: +

There are two different levels in museums [...] there is the general audience, which is like k12, and like continuing education, and then the scholarly engagement which is a secondary thing. And I really feel like that's a false dichotomy that has been build up in that (Scholar 6 2016).

All these responses reinforce the idea that online resources are not clear cut scholarly or else. They can potentially appeal various audience segments. As some museums opt for designing online resources which have not only one but several implied readers, are the categories of "scholarly" and "general audience" adequate? In fact one of the six online resources here chosen to pursue research—namely the National Gallery of Art *Online Editions*—follows a "skim, swim, dive" approach in which "short synopses for the general reader, further

information for the curious amateur, rich content for the scholarly researcher” are provided (Getty Foundation 2017). However, in order to find out if such readership broadening approaches function with audiences other than the scholarly, research should be conducted.

Summarising the present results, applying the concepts of real reader and implied reader helps to interpret the findings by differentiating between expectations and actuality regarding audiences. Findings make clear that putting online resources on the Web alone does not guarantee that audiences reach them. Additionally, the concepts of real and implied reader help to interrogate for whom are online resources developed. Results prove that the implied and real audiences of online resources are not as monolithic as literature affirms. Resources are layered and may be aimed to several segments of the audience instead of just one, becoming relevant to wider audience segments.

5.4 The scholarly interpretive community. Identity, meaning-making, and reading strategies

This research was purposely designed to study scholars, who are a recognisable audience segment of the museum, because of the experience of the thesis author in the development of scholarly resources. Existing research on them describes how they use online resources and for what purposes, yet, there is no account of how they interpret narratives. The notion of interpretive community (Fish 1980) extrapolates to the study and definition of readership in online resources from a narratological perspective. This chapter also adopts Hooper-Greenhill’s proposal to anticipate interpretive communities through research to analyse the research results (2007, 79) and conceives scholars as an interpretive community defined by the specialist knowledge of its members (Mason 2005, 229).

From the beginning of the research process, the recruitment of participants is symptomatic of the degree of interest art history scholars, and scholars of closely related areas, have in digital scholarship. As said in the description of the methodology, participant scholars were either digital scholarship practitioners or digital “enthusiasts”. The views of skeptical scholars, or simply uninterested individuals, are not represented by the results. Several participants have been involved in digital projects such as digital repositories and catalogues in museums and universities, or have pursued research that utilised art historical databases or three dimensional models. Some participants have employed digital media to disseminate knowledge and research. A substantial number of them have worked or work in art museums at some point in their careers, although not always in “digital” roles. And every participant uses online resources for research as well as for teaching. Literature reveals that digital media is being

progressively implemented in art historical scholarly practice (Zorich 2012). Hence, it can be asserted that participants' digital backgrounds are exceptional and not the rule. This has implications on whether art museums' online resources are used or not by the scholarly community, as their use depends in great measure on how well accepted is digital scholarship by scholars. Participant's responses were revelatory in this respect. Participants admitted art history is conservative and not all scholars are familiar with technologies:

It's a little bit conservative discipline (Scholar 6 2016).

A lot of art historians I know are terrible with technology [...] The slide projector is beyond them (Scholar 2 2016).

This is reflected on how online resources are used for research. Confirming what various studies on online resources and digital art history say (Getty Foundation 2017; Mundy and Burton 2013; Mann 2016). Even though online resources are increasingly gaining recognition among scholars, there is still a lack of status of those resources, that are not used, reviewed, or referenced as print publications and physical exhibitions:

I think there's always the problem that website and online content is not always that accepted in research. [...] If you can choose between citing a website or citing a real book, you should probably always chose the book because it's more respected (Scholar 19 2017).

The status of digital scholarship and online resources is also reflected in teaching and learning. For younger scholars completing postgraduate studies having a mentor or instructor who introduces them to digital scholarship and invites them to use digital resources is key to develop an interest in them:

Our professors are reluctant to tell us about them [online resources] (Scholar 7 2016).

It depends probably on you mentor. Who do you work under, whether are their techniques, their processes, what are the resources that you have suggested versus the ones you've to find in your own (Scholar 8 2016).

It is worth noting that research data suggests that younger generations of scholars are more prone to adopt digital scholarship for study, research, and teaching. Most of the early career scholars who participated in the research were interested and welcoming towards digital scholarship and online resources without necessarily being digital art history practitioners.

They were just regular users of online resources and other digital materials. However, in order to obtain more conclusive data about the matter a quantitative survey could be beneficial.

A couple of participants suggested that the time period they work with might also influence whether they use online resources. They think contemporary art pieces have a major representation on the Web, therefore scholars would be more likely to use digital contents related to those:

I think depending on what your canon is. More contemporary canons kind of automatically lead themselves to the digital world and for people who are staying for classical canons the step is not automatic in the same way. [...] So I think it depends in your field (Scholar 8 2016).

I find the people that I've talked to who are looking at the same time period as I am, the past thirty years or so, do really appreciate these resources. Again, a lot of what you're studying is video art or [...] the kinds of interactive things that are more accessible through the Internet (Scholar 12 2016).

Besides acceptance and likeliness to use art museums' online resources, scholars' backgrounds and fields of expertise play an important role in the process of reading and interpreting a digital narrative. The importance of readers' and museums visitors' backgrounds in meaning-making processes—a matter that literature has extensively addressed (Doering and Pekarik 1996; Silverman 1995; Everett and Barrett 2009)—is as well confirmed by the research results. Very often, the main motivation to click on hyperlinks or concentrate attention in parts of the narrative is strongly determined by the scholars' area of speciality. For example, for a scholar specialised in Asian art what sparks their interest are the Asian artworks within a selection of pieces from all over the world. Similarly, a scholar whose background was on Byzantine art would be more interested in Byzantine art references and pieces when navigating a resource covering another subject:

This is actually a byzantine related thing here, I mean I'm a Byzantinist (Scholar 16 2016.)

I just go back so I would like to see the "Byzantine and Italian painting" essay (Scholar 16 2016).

During the think-aloud protocol sessions scholars consulted online resources whose topic was as close as possible to each scholar field of expertise. Their judgements and interpretations were based on their previous knowledge of the subject and they valued particularly when the content was new to them:

So what is good about that is it not an obvious painting. Because there are familiar famous images [...] which is quite good in a way, if you're an expert (Scholar 4 2016).

I really like Louise Bourgeois, but I sort of thought she was more sculpture, so it's interesting (Scholar 12 2016).

More arbitrary reasons such as having visited or lived in certain countries or cities, knowing a curator or the artwork, influenced decisions of the scholars while browsing the online resources.

To this point, it is clear that the background of scholars shapes their interpretation or meaning-making of narratives. But what strategies do they deploy in online resources? Participant scholars use both images and text, they perform “visual analysis” (RCMG 2001a and 2001b) as much as they read additional information:

I look at an image and then I go back to the text to see what it says (Scholar 19 2017).

I am reading the text to understand what those things are (Scholar 11 2016).

Research findings show that scholars pay attention the “when, what, where, who, how and why” (Herman 2013b) dimensions of narratives while they read resources. For example, they looked at the artist name, which can be interpreted as the “who” of the narrative, the artwork, the “what” of that narrative. The dates and place of creation respond to the “when” and “where” of that narrative. These “socio-cultural” dimensions (RCMG 2001a and 2001b) are generally visible in online resources in the form of titles and texts, as participant scholar 8 describes: “I've open it up, there is a banner, I can see the title [...], the year that they're covering, who is about” (Scholar 8 2016). The spatial and temporal dimensions of a narrative are also visually represented in timelines and maps which participants explore in order to get the “when” and “where” of narratives: “Here there is this map, so you can click on things by place, by year” (Scholar 7 2016).

Furthermore, online resources facilitate materials that describe “processes of making” of artworks (RCMG 2001a and 2001b). Participants gazed infrared and x ray photographs which tell them about the technique, the “how” of artworks' creation: “This is interesting because in some particular cases you can see how works have been changed” (Scholar 13 2016). But sometimes scholars are required to perform visual analysis in order to grasp narrative dimensions. This was manifest when participants visited the online resource *82nd & Fifth*. The resource in its landing page offers fragments of the artworks instead of the full image (see

figure 5.5), and evocative thematic titles instead of the titles of the artworks or the names of the artists. Participants rapidly identified the artwork or at least its style by visually analysing it, yet, this was only possible because of their prior knowledge and familiarity with the subjects:

It is easy to find the objects if they are cropped. It actually is just because I think I'm pretty familiar with them, so it doesn't feel difficult for me. But I could imagine for someone who is not familiar it'd be confusing like what is, is this a painting, a tapestry? (Scholar 11 2016)

These images are details. If you've seen something at a museum, you're not a professional, and you compose, you might not even recognise this because you might remember the entire picture you might not remember a particular detail and so it's gonna be hard for you to find something here (Scholar 13 2016).

Participants indeed demonstrate how they use their abilities and specialist knowledge to identify the artwork, who made it, its style, etc. and think for a regular visitor it could be difficult to recognise the artwork easily in the same way they did. Once again, this reinforces the idea that scholars' knowledge and skills are among the most important factors shaping meaning-making strategies they deploy. Meaning-making strategies that draw the meaning of narratives into the personal lives of participants, such as "narrative identification" (Leinhardt et al. 2002) and "empathic identification" (Toit and Dye 2008) are not relevant to scholars. The research data does not offer any evidence in this regard. The professional identities of scholars prevail over their personalities and emotive traits when they interpret what they see and read.

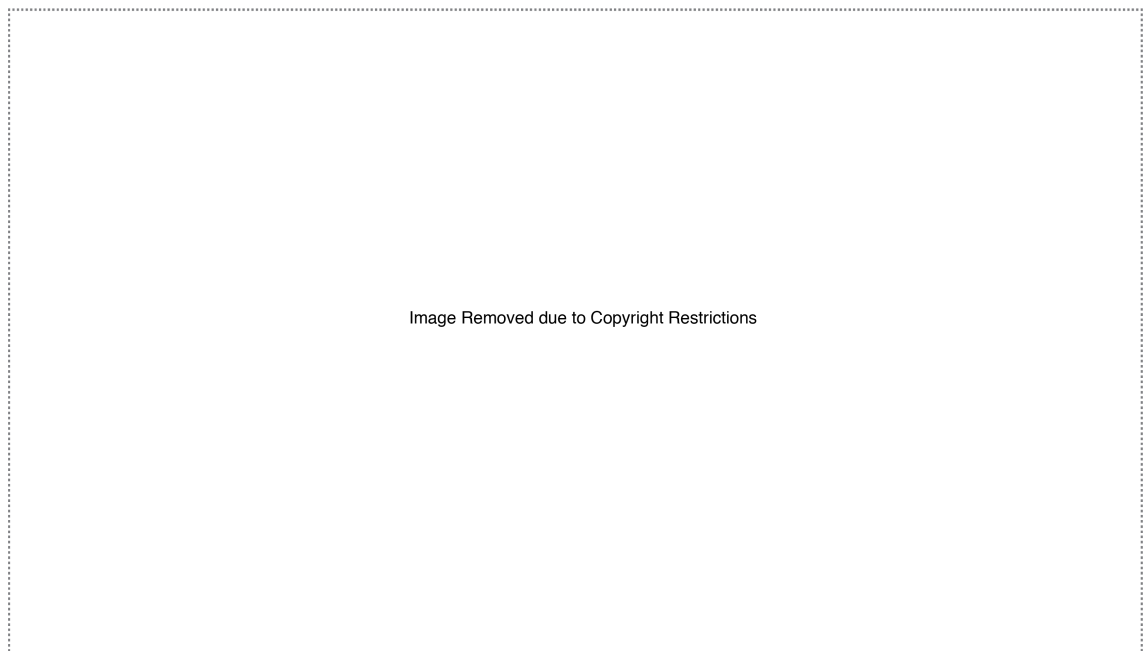


Figure 5.5: Home page screen capture. *82nd and Fifth*. 2013. <https://82nd-and-fifth.metmuseum.org/>

Following the idea that form and content have a mutually dependent relationship (Schorch, 2013), meaning-making in online resources is shaped by digital media. More specifically, the reading and viewing that leads to make meaning out of narratives digitally can be different from the one that takes place in galleries or while reading a book. The temporal and spatial qualities of digital media, that have been broadly discussed previously, are the “form” that shapes content in digital narratives. Research results are illustrative in this regard, different types of digital reading help participant scholars to extract the meanings of the narratives.

The literature review indicated that one of the most common and traditional reading modes is close reading. It is generally thought that close reading of narratives is disrupted by digital media, nevertheless, this research proves that close reading might as well happen in online resources. Think-aloud protocols did not support a lengthy reading process, yet, as the research exposes, the scholars who participated in them explained that when they navigate online resources scan and skim the sites until they fix their attention into relevant information with which they would spend time. They would then close read the resource.

Moreover, if the concept of reading is broadened to the reading of an artwork, becoming then “close viewing”, the viewing of artworks facilitated by high resolution imaging responds to the principles of close reading. The careful and “forensic” analysis that high resolution images favour is almost unique to digital media. It only occurs within a conservation lab where the artwork is being looked through a microscope or a magnifying glass. The research data revealed scholars unanimous appreciation for high resolution images:

Some people of course argue that not how you wouldn't enjoy this work or experience this work in person, you wouldn't have been far or in a church, but I see a lot on the ability to get really close and see the details (Scholar 14 2016).

This is better than seeing the painting in the original. Unless you're standing there in the conservators laboratory which never happens, right? (Scholar 19 2017)

Art museums are aware of the benefits of using high quality images of the artworks which they include in their online resources. In two of the six online resources, ad hoc photography and digitisation of the artworks were developed. As practitioner number four states, technical advancements in photography are overturning the idea of the image as inferior substitute of the work of art:

I think when you look in the computer and you see a beautiful work of art either photographed differently, or enlarged in a way that you simply cannot see it if you stand in front of it, has value (Museum professional 4 2016).

Moving into different reading strategies, scanning and skimming, the strategies used to read hypertexts (Hayles 2012) (Guillory 2008) are used by participant scholars as they browse online resources. These reading strategies are guided by the pressing need of obtaining information quickly and are favoured by digital media. The previous sections dedicated to the study of time and space in digital narratives describes that participants often fixed their attention into paratextual elements of online resources, such as titles, illustrations, menus, links, or author names, before delving into the text. Moreover, before reading a text participants would scan it to understand if it was worth their interest. The negative connotations of rapid navigation in museums' websites and online resources (Birchall and Faherty 2016; Samis and Svenious 2015) contrast with the behaviours displayed by the participants of this research. The research results demonstrate that scanning, skimming, or “snaking” content, in sum, non linear navigation on a website, can lead also to engaged interactions. The reading of online resources comprises several strategies and close reading sits along hypertextual and fast reading.

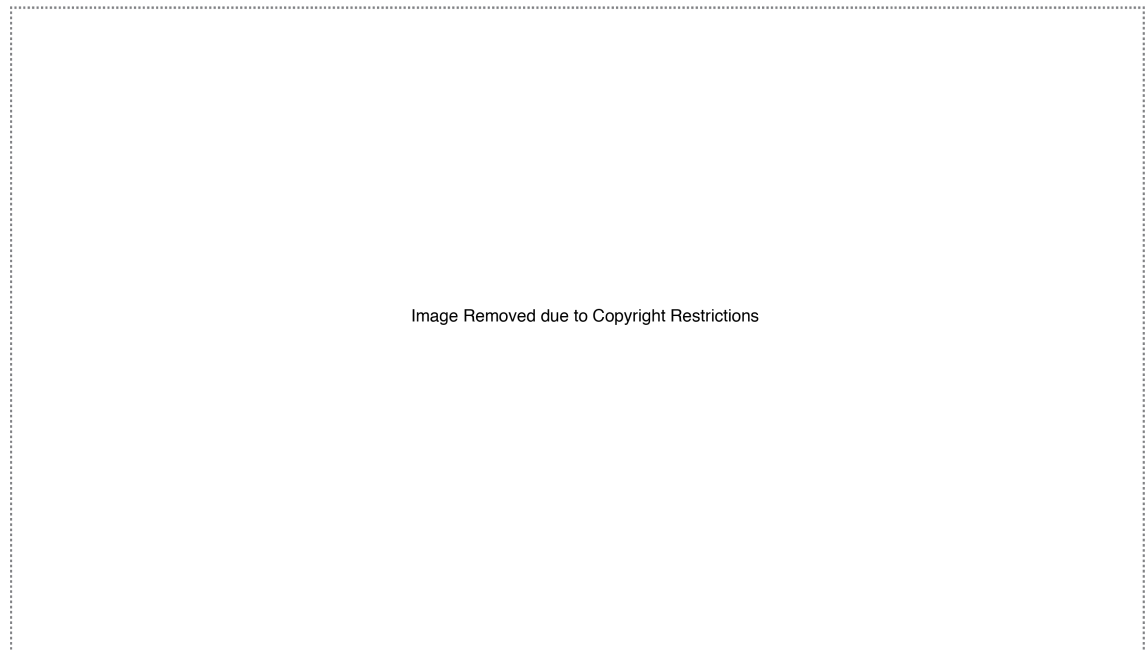


Figure 5.6: Screen capture of Interactive network graph. *Object: Photo. Object: Photo.* 2014. Museum of Modern Art. <https://www.moma.org/interactives/objectphoto>

A third reading strategy, distant reading, is partly enabled by one of the six studied online resources, MoMA's *Object: Photo*. Although Hayles (2012) categorises it as a reading strategy, distant reading is more than that. The term coined by Franco Moretti (2013), refers to the gathering and manipulation of multiple texts to be analysed with computational methods. The resulting outputs of this analysis are visualised through graphs and diagrams (see Figure 5.6), what literature calls “visual rhetoric devices” (Davis et al. 2016). The notion of reading in distant reading encompasses the analysis of the data itself and the reading of the data visualisations, but in the context of this section the term will be used to address the reading of

the visualisations. In reference to *Object: Photo*, the online resource presents a macro view of different attributes of a photography collection through a series of visualisations that graphically represents relational art historical data. It compares the spatial variables with chronological, artists, or artworks variables. It is worth pointing out that not all types of visualisations within the online resource lead to distant reading in absolute terms, because the amount of data visualised is minimal in some of them. Participant scholars were particularly intrigued by the diagrams. Most of them admitted that diagrams helped them to actualise meaning more easily than through other methods or even gain a different understanding of the narratives:

This is really pushing the boundaries of [...] what you can do with data visualisation stuff, because [...] it's like you can have books about these topics [...] and a list of exhibitions, and actually seen it like that it's like wow! [...] The topics as well are giving you connections between art history that wouldn't think about [...]. When I do research and I read the books I try to think a bit more like that and trying to think about the kind of connections (Scholar 7 2016).

The map [...] just gives a different perspective that a lot of people don't think about with looking at art (Scholar 12 2016).

I would say using geography [...] in multiple ways both mapping artist lives and mapping the photographs, that's an interesting way of thinking. I'm sure there is a way I could spend some time to overlap the photos of Berenice Abbott and her life and turn out some conclusions of those stories (Scholar 6 2016).

An important aspect of distant reading that should not be overlooked, is that it empowers the reader. The responsibility of making meaning out of diagrams is to a larger extent given to the reader, something that is not free from criticism: "the task of interpreting [...] patterns is left up to others. As a result, digital art history has a fraught relationship to history and interpretation" (Bishop 2017). What is a negative aspect of distant reading for Bishop, can one of the main strengths of it for many others. A great deal of the literature cited in different parts of this thesis argues that museums should abandon authoritative narratives, hence these diagrams by being less conclusive and open to the audience interpretation contribute to the transformation of the museum authority.

This section provides a picture of scholars as an interpretive community. Research establishes that the meaning-making and reading strategies scholars use with online resources are formed, as expected, on the basis of their knowledge and area of specialisation, but the digital background of scholars also plays a role in their appreciation and relationship with online resources. The present section also exposes what meaning-making and reading strategies are

employed by scholars as they consult online resources and how these strategies favour a different understanding of the subjects approached by narratives.

5.5 Conclusion. A definition and its implications

As an alternative to incomplete, ambiguous, and imprecise definitions of art museums' online resources, these research results establish the attributes of online resources as narratives. Yet, the results are not only limited to a description of the characteristics of online resources, but they also critically examine the resources. The research results provide the reasons why online resources have such narrative characteristics, how these characteristics enhance museums' narratives, and what challenges they present to art museums and scholarly audiences. At a glance, figure 5.1 schematises narrative attributes and the variables this results chapter has determined for the definition of online resources. Besides this schema, the implications of the definition are summarised as follows:

In terms of authorship, the research solidifies the idea of authorship in the museum as collective and collaborative, in consonance with the literature, yet reveals authorial hierarchies affecting professionals and departments involved. It also shows what challenges are imposed by the digital nature of these new narratives; according to the research findings, collaboration between digital and non-digital professionals requires adaptation and the introduction of new professional profiles. Museums' institutional authority is also interrogated by research in relation to authorship. Results prove that museums should still strive for more transparent, open, and multivocal narratives. Research participants recognise the new authorial values museums embrace but point to underexploited technical capabilities that would transform narratives even further.

Concerning mediality, online resources are characterised as multimedia. Typically, however, one medium prevails over the other; the prevailing medium is, and should be, the visual. The results expose that, according to the scholarly audience, museums should create online resources in which images of the artworks and other supporting visuals are served by the verbal. This is to say that the relation between visual and verbal must be more balanced.

Temporality and spatiality are two attributes of narratives that the research results extensively examine. The results are illustrative of the representations of historical time and space and the challenges that these present to museums. Indeed, museums face the challenge of representing temporality and spatiality based on what is often incomplete and vague art historical data. Moving into the temporality of the resource itself, results indicate that online resources adopt several temporal models which are not without challenges. Online resources can be kept

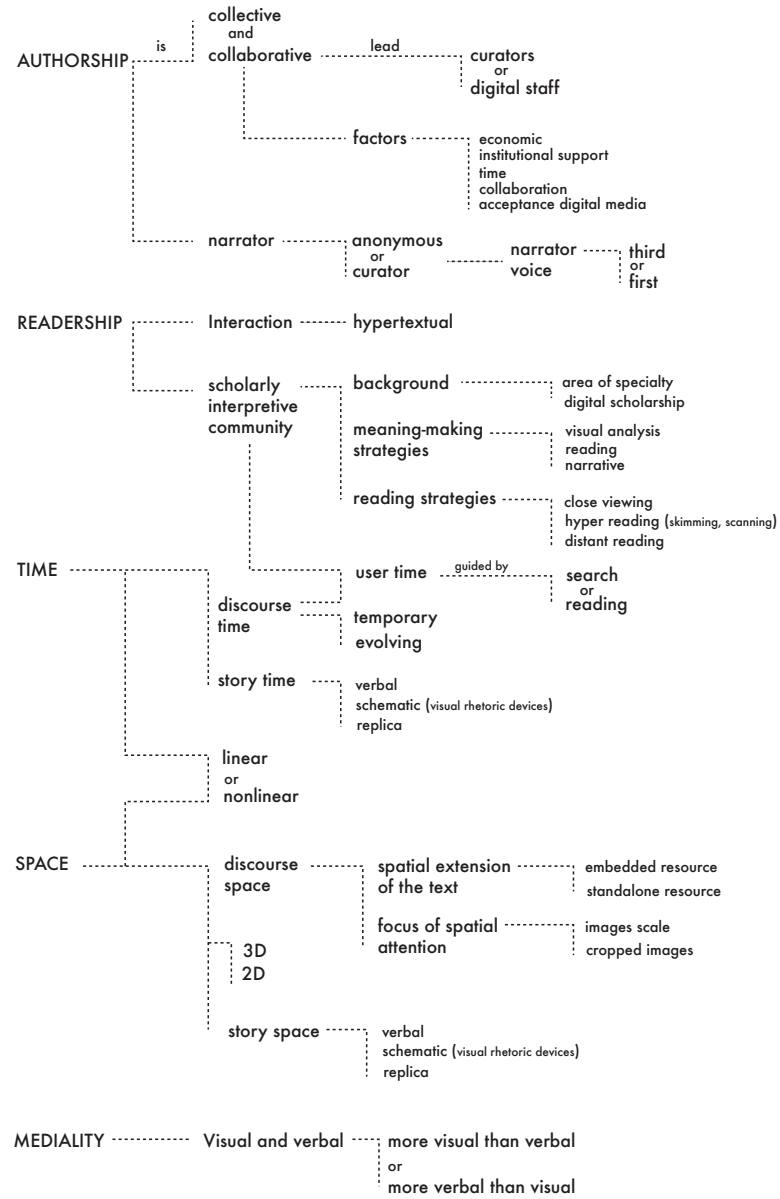


Figure 5.7: Definition schema. Figure by the thesis author.

permanently and evolve over time, but both options require strong commitments from institutions in terms of labour and funding. The results highlight the importance of user time in defining a narrative's temporality and characterise the user time of the scholarly audience as pressed by information-seeking behaviours. This makes scholarly users prone to skimming and scanning resources in order to obtain the information they need. As with temporality, online resources follow spatial types or models. Results do not contradict the literature that divides the types between three-dimensional and two-dimensional, although they are revelatory of the rationale museums follow when they choose one type over another. The research seeks to understand if online resources constitute established spatial types, and although museums intend to follow standards and replicate recognisable practices when developing online resources, spatial types are not established yet. The discussion of spatiality is manifest in additional aspects of online resources that the results introduce. Online resources can be categorised as embedded and non-embedded in the main museum website. Each model presents different degrees of narrative cohesiveness and spatial extension and situation, with implications in readership and usability. The narratological concept of *discourse space*, conceived as the *focus of spatial attention*, helps to examine research results relative to the format and spatial arrangement of artworks' images. Research shows how these spatial manipulations either enhance or undermine the reading and comprehension of images. Finally, research defines online resources as linear or nonlinear. Results are decidedly illustrative of the advantages and disadvantages of these two attributes in terms of authorship and readership, reiterating the literature in some particulars but also overriding it.

Readership is the last attribute presented by this chapter. Online resources let the reader interact with the resource. They adopt a classic model of hypertextual interaction that gives agency to the reader, who chooses different options and makes different queries. Findings picture the qualities of this model from the perspectives of the authors and the readers. The study of the intended audiences of online resources is benefited from the application of the concepts *implied reader* and *real reader*. The results, interpreted from this perspective, offer an analysis of expectations and reality. On the one hand, museums develop online resources for an audience. On the other hand, this audience might not be reached, or the reached audience might differ from the intended one. Moreover, research shows that online resources can be aimed to multiple audiences instead of just one and, following the suggestions of literature, that some of the functionalities and visual qualities of general-audience resources are relevant to scholars. A major contribution of the research belongs to the definition of the scholarly audience as interpretive community on the basis of its specialist knowledge. Results put emphasis on the digital background of scholars, which, along with their area of specialty, determines acceptance and interest in online resources. Results point to how meaning is made out of resources and the reading strategies scholars utilise when consulting online resources: close viewing, skimming and scanning, and distant reading.

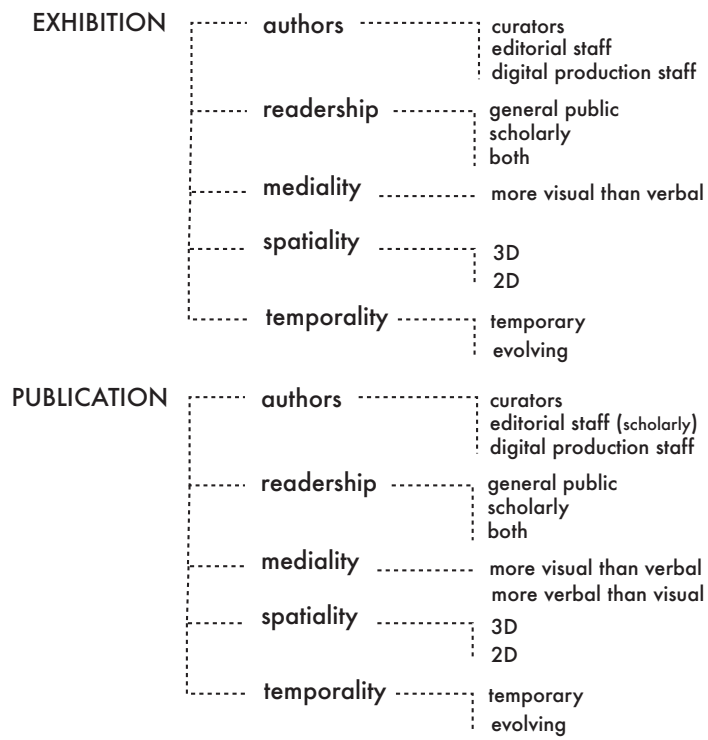


Figure 5.8: Comparing typologies schema. Figure by the thesis author.

Besides establishing a definition of online resources as narratives, the research further interrogates the online exhibition and online publication typologies departing from the lack of consensus on what they are. Results prove that the conventions that delimit two separate typologies coexist with evidence that rejects the dichotomy between exhibition and publication. Figure 5.1 sums up the similarities and minimal differences. Corresponding to the narrative attributes that structure the definition, online exhibitions and online publications are regarded in terms of authorship, mediality, temporality, spatiality, and readership. While the research results shows that publishing departments and editors are involved in the creation of online publications, it is demonstrated that publishing and editorial profiles are as well involved in the production of other online resources. Results highlight that print publication authorial crediting conventions are present in online publications, which are used and cited as publications by scholars. Yet, as these results discussed, examples of online exhibitions that have a similar crediting model are brought in to prove that no difference exists in this regard. Research contributes to the debate of mediality, stating that, according to some participant scholars, online exhibitions are predominantly visual and online publications textual. Nevertheless, these are statements that not every scholar shares, leading to the rejection of a differentiation of typologies grounded on mediality. Results are not conclusive about spatial and temporal differences between online exhibitions and online publications beyond literature. But they denote that museums prefer the online publication or interactive resource model over the online exhibition model. The idea of online exhibitions seems to be still connected to the temporary exhibition and the three-dimensional replica of the gallery space, both notions that museums do not favour, while the audience remains neutral. Lastly, with regards to readership, research provides additional proof that no specific type of online resource serves a specific segment of the museum audience. Resources labelled as online publications present contents relevant to scholars as well as non-specialised audiences. In light of this evidence, two possible scenarios for typologies are possible: in the first, typologies expand their current definitions, still taking into account existing conventions while perpetuating overlaps and unspecificity; in the second, typologies are rejected, and the common and unifying definition this research proposes is established and recognised by practitioners and audience.

Chapter 6

Conclusion

6.1 Findings and contribution

This thesis has developed a definition of online resources as narratives in response to the following question: ‘How can online resources, such as online exhibitions, online publications, and similar resources, be accurately and systematically defined?’ The aim of this definition was to provide a detailed, clear, and critical understanding of certain types of online resources, namely online exhibitions and online publications, that share attributes and functions. The two types of online resources contain and display exhibitions and artworks narratives, use similar interfaces and media, serve similar audiences, and tell stories of the artworks. Based on the narrative character of both types, the definition comprehensively examines the spectrum of attributes of online resources and the implications of such attributes. Consequently, the definition not only indicates what are online resources and their characteristics, but also explains why online resources present certain characteristics, and how these characteristics function. In order to construct the definition, a systematic review of narratology and museum studies literature on narratives was pursued.

The review of narratology and museum studies literature was key to developing a comprehensive analysis of the subject. The holistic approach to the idea of museums as narrative texts has rare precedents in museum studies research, that is rather focused on specific narrative attributes instead of on the whole narrative. Moreover, the methodology used in this thesis revised the traditional usage of narratology in museum studies research integrating empirical evidence. In this way, the narratological analysis moves away from the narrative text itself to consider the production and consumption mechanisms of the narrative.

The paragraphs that follow provide an overview of thesis centred on the development of the

research, including the review of the literature, choice of methodology, and research findings. After the overview, the chapter delves into research implications, limitations, and areas of further research. The thesis structure separates the review of the literature and state-of-the-art, the chosen and applied methodology, and the research results. The review of the literature served the research in different ways: it contextualised the research problem into museum studies literature, gave a narratological theoretical foundation to the definition of online resources as narratives, and identified the gaps the research should fill. The research problem stemmed from the reflections of the thesis' author on her professional experience, yet, a careful analysis of the literature contextualised the problem. In section 2.2, the examination of museum studies texts confirmed the existing overlaps, contradictions, and a lack of consensus on what constitutes an online exhibition and an online publication. Ultimately, it is established that online exhibitions and online publications should be examined and defined together instead of separately.

Section 2.3 of the literature review extensively studied narratology, the theory that studies narratives. It outlined the narratology terms this thesis applies and the state-of-the-art of narrative approaches in museum studies research and practice. This led to identify what elements characterise narratives, digital and not, and to understand how museums in general, and art museums in particular, their exhibitions, publications, and digital resources, constitute narratives texts. The section established the principles that characterise museums as narratives. Museums constitute texts that contain other texts, and that their interrelation creates an intertextual exchange between them. These texts are formed by the main text and the paratexts, that serve as a threshold to interact with them. Additionally, according to narratology, the structure of a narrative text comprises 'what it is told', the story, and the 'telling of this story', the discourse. An important principle guiding the understanding museums as narratives is the nonfictional and historical character of these narratives.

The following subsections of Section 2.3 dissected one-by-one the attributes of narratives and how museum studies literature have addressed them. They are authorship, mediality, temporality, spatiality, and readership. The subsection that corresponds to authorship called for a close examination of how collective and collaborative authorship is articulated in museums' online resources. It concluded that research should address who are the authors of online resources, and how the hierarchical authorial scheme in narratives is configured and presented to the audience. The subsection also acknowledged that digital media reshape collective authorship and pointed to the need of in-depth study of collaboration in the realm of online resources creation as well as the authors' digital skills acquisition. Museum studies texts criticise that museum-as-narrative-text approaches overlook contextual factors conditioning authorship. In response, this research should be designed to fill this void. Lastly, the subsection identified the authorial attributes that shape the institutional authoritative character of

museums, and questioned whether online resources preserve this authoritative character in online resources.

The subsection that enquires about mediality invited to pursue additional research on the relationship between the verbal and the visual in online resources. This relationship is based on the long-held debate about the relationship between word and image, and extends to the usage of verbal and visual discourses in art museums and art history. Questioning what medium prevails in online resources also responded to the necessity of further interrogating the validity of typologies, the exhibition and the publication, and ultimately either embrace or reject the definition of online resources as distinguishable typologies. The temporality and spatiality of narratives were the next elements under scrutiny. Subsection 2.3.6 looks at these two elements. The two are extremely relevant in characterising museums as narratives. Museum studies texts agree that, on the one hand, the paradigmatic spatial character of the museum galleries, and on the other hand, the institutional temporal framework framed by the preservation function of the museum, strongly define the nature of museums as narratives. The subsection explored how these two attributes have been reconsidered and transformed with digital media.

This pictured a complex situation in which multiple concerns that needed further attention emerged. These concerns are the look for identifiable spatial and temporal types online, and the implications, consequences, and benefits of digital media in remediating and moving away from previous models in terms of temporally and spatially. Subsection 2.3.7 observed readership and established that the audience of the museum can be studied upon reader response theory, as well as certain readership terms. It highlighted how the figure of the reader is viewed by the author and examined the role of the reader in narrative meaning-making and how subjectivity determines how meaning is actualised. The subsection also denoted the suitability of the concept of interpretive community for the purposes of this research, laying the groundwork for careful research of the scholarly audience and reception of online resources.

Chapter 3 described the utilised methods and research procedures. In it, emphasis was given to the integration of empirical research with narratology. This approach allowed to capture evidence from authors and readers with the purpose of generating a definition that conversed with museum practice as much as with narratology. The methodology chosen for this purpose was narrative research, and its variety, structural analysis. This analysis allows the collection of empirical data, their subsequent coding and analysis in line with narratology concepts. The chapter also focused on the survey of 130 art museum' online resources and the following selection of six online resources, representative of common practices and characteristics of online resources, that served as sources for in-depth research. Data from museum professionals involved in the creation of the six selected online resources, and from scholars acting as the

audience of the resources, was gathered. The data collection methods were varied. In the case of museum professionals, data was collected through semi-structured interviews with 7 individuals, the questions investigated the principles that guided the conception of the online resources they produced. In the case of scholars as an interpretive community, the focus of the data collection was on capturing their interpretive and reading agencies. Think-aloud protocol, paired with profiling and retrospective questioning, was the method chosen because its suitability for such purpose. The data collected was transcribed and coded following what is called as narrative coding, a coding variety that identifies narrative attributes in the data.

The research results were divided into two chapters: the first exposed the main findings of the survey that led to the selection of the six online resources, and the description of these six online resources; the second chapter extensively discussed the research results that contextualise and constitute the definition of art museums' online resources as narratives and the implications derived from it. In Chapter 4, the results of the survey showed what attributes of online resources are more widespread and what typologies are more popular, and in addition, it highlighted the fact that online resources are commonly developed by major museums. The final six selected online resources were from three countries, Spain, the United States, and the United Kingdom. These were: Online Editions (National Gallery of Art 2014), Object:Photo (Abbaspour et al. 2014), 82nd & Fifth (Metropolitan Museum of Art 2013), Bosch. A story in pictures (Museo Nacional del Prado 2016), Featured Artworks (Museo Nacional Centro de Arte Reina Sofia 2016), and Building the Picture: Architecture in Italian Renaissance Painting (Lillie 2014). Each of them presents unique features as well as similarities with the surveyed online resources.

Concerning Chapter 5, its structuring mirrors the organisation of Section 2.2 of the literature review. It is therefore dissected into sections and subsections that follow the ordering of the subjects in the literature review, starting with authorship and finishing with readership. One by one, the sections set out the basis to define the narrative attributes of online resources and expose their implications for art museums and the scholarly audience. Beginning with the exploration of collective authorship in the museum and collaborative mechanisms, the research findings give concrete insights on how authorship is articulated beyond museum studies texts. Findings illustrated the hierarchies of collective authorship and uncovered that authorial processes can be lead by different individuals and departments. Different models emerged from the results: there are projects directed by curators, and projects directed by digital departments or staff, sometimes in conjunction with publishing departments. The research also exposed the factors that influence the creation of online resources. These factors coincide with the ones indicated by literature and with the thesis author's professional perspective. The potential of digital media is not fully exploited because of reasons that go beyond technological capability. Museums face limitations in terms of economic resources, logistics, staffing, and

time constraints when they created online resources. However, museums are presented with opportunities to develop online resources too. The present moment is favourable to technological developments. Section 5.1.2 focused on results that present museums as a rather authoritative and biased institution, an aspect of authorship that came across when scholars visited the six online resources. Despite technological advancements, the scholarly audience agreed on that museums could become more transparent about their own authorship mechanisms, be less biased, and embrace multivocality and other perspectives. The research results pointed to the potential of the Web and the digital medium to achieve more plurality and transparency in online resources and to finally “break the walls” of the museum.

In section 5.2, the findings picture online resources as narratives that are, and should be, more visual than verbal. Even though some authors affirm that digital media favours a more effective integration of images in art-historical textual discourses by giving images more prominence in them, according to the participant scholars’ perspective, online resources should and could become even more visual. Moreover, in the research results, the strong visuality of online resources denoted the marked spatial quality of online resources. Subsection 5.2.7 examines the articulation of the space as a focus of spatial attention which affects the presentation, format, and scale of the images of the artworks. This greatly influences the understanding of the objects and meaning-making of the narrative. Participant scholars were particularly attentive to this aspect. An aspect that has remained overlooked by museum studies literature on narratives.

The analysis of spatiality and temporality offered extensive insights on how the two of the narrative attributes characterise online resources. The research findings reinforced the idea that, in terms of temporality, the digital medium imposes an evolving and changing dimension to online resources. The research offered evidence of how this specific temporal dimension of online resources poses notable challenges to museums. Either preserving resources from obsolescence, or accommodating constant changes in them, becomes a serious concern for museums that need to rethink their workflows and funding schemes to take full advantage of the affordances of digital media. Temporality affects other aspects of online resources. In subsection 5.2.2 the findings on the notion of user time, provided a breath of evidence that introduces the purpose of the visit and temporal framework of scholars in their reading of online resources. These findings also framed the role of search behaviours in the reading process. Scholars need to make effective and rapid searches in online resources, yet, they would spend more time with the resource if it serves their interests and search objectives. The user time temporal dimension also revealed the connections between narratology and usability, which implies the usefulness of applying certain narratology concepts to the conception and evaluation of online resources.

Returning to spatiality, findings on Section 5.2 demonstrated that online resources do not yet constitute a specific spatial type. However, museums emulate the interfaces created by other institutions and media in order to provide recognisable forms to the audience. An interesting finding relative to the spatial types in online resources is that museums do not favour the three-dimensional gallery reproduction model. The data from the survey showed as well that there are very few online resources that employ this model despite its popularity, and the responses of museum professionals proved that the reason why not doing this are the negative implications of merely replicating the original space. In terms of spatiality, online resources can be categorised as standalone or embedded in the museum website. This speaks about different degrees of intertextuality between the resource and the main museum website and leads to question the boundaries and extension of the text. The research provided concise findings relative to the advantages and disadvantages each category presented. The cohesiveness of the narrative is at risk in embedded resources compared to a standalone one, although discoverability and hypertextual connections are fostered in embedded resources. The research also provided particularly interesting findings that link narratives to usability or user experience research beyond what has been summarised in the previous lines. During the think-aloud sessions with participant scholars issues related to the placement and visual design of paratextual elements of resources (including buttons, menus, and titles) emerged. These issues were detrimental to the flow and completeness of the narrative, and therefore the experience of the user of the resource, demonstrating the applicability of such narrative methodology to user experience research. In subsection 5.2.8, additional spatial and temporal categories were addressed by the research: the linear and the nonlinear online resources. The findings that allow the comparison between linear and nonlinear online resources make clear what are the strengths and limitations of each model. This is an aspect which museum studies literature does not cover extensively. The subsection illustrated that nonlinear online resources benefit searching behaviours and rapid navigation, whereas linear online resources are oriented to slower interactions and concentrated reading. Additionally, nonlinear online resources give more freedom to the reader but are complex, while linear resources guide the reader through the narrative limiting the interactions and present more uncomplicated stories.

Section 5.3 of Chapter 5 provided a further understanding of the art museum scholarly audience. The agency of the reader in processing narratives was acknowledged. The application of the terms *implied reader* and *real reader* to the discussion of online resources audiences helped to analyse the complex nature of the issue challenging assumptions regarding types of online resources and their suitability for different audiences. The findings reveal that online resources can be relevant to several audiences and not just a single one. The use of online resources for teaching at university level was highlighted by participant scholars, demonstrating the weight of instruction and teaching in scholars' professional practice and the relevant role online resources play, or could play, in it. Furthermore, the findings confirmed

that online resources aimed to general audiences decidedly present technical features that are useful to scholars. These features, with some degree of customisation, can be used to support scholarly narratives. This should invite museums to adapt practices and attributes from general audience oriented resources into the more scholarly resources they develop. Another concept and framework, the one of the interpretive community, was employed to accurately portray scholars as a specific segment of the audience as they interpret online resources. This approach allowed to grasp what meaning-making and reading strategies are used by scholars when they read online resources, besides revealing how their areas of specialisation and digital background determine their relationship with online resources.

The research was also aimed at interrogating the typologies, the online exhibition and online publication, beyond what literature has to say about them. In answering the question ‘Can online exhibitions and online publications be actually distinguished?’, the research findings showed that there are still some conventions and generalisations leading museums and audience to distinguish typologies on certain occasions. However, the research showed that the conventional views on the typologies coexist with contradictions too in similarity to what the literature review on the typologies affirmed. This was particularly evident in the section of the results chapter that provides arguments that either conceive exhibitions as more visual and publications more textual, while also overturning such convention.

6.2 Limitations and further research

Reassembling the ideas exposed in the thesis methodology description, the most notable limitation of the research was the lack of representation of non technologically savvy scholars in the collected data. Although this has been interpreted as a symptom of the lack of interest in digital technologies among a segment of art history scholars, the research results could be complemented with insights from not technologically savvy or sceptical scholars.

Despite research was designed with the aim of studying scholars at different career stages, undergraduate students were not taken into consideration. Yet, interestingly, some scholars suggested that younger generations, in particular their own students, appear to over rely on digital material, often ignoring not digitised materials, and are not aware of institutional procedures and biases in the digitisation of artistic heritage. This invites to further investigate the generational gap that may have an impact on the perception and visibility of heritage, digitised and not.

The research design did not contemplate the study of other segments of the audience, however, the same methodology could be used with additional audiences. This constitutes a direction for

further research rather than a limitation, and it could provide substantial insights that can be compared with the ones relative to the scholarly audience, as well as with the museum-as-author perspective this research offers. Questions that invite to the comparison between audiences are: Do other audiences perceive the museum authority like scholars do? Do other audiences share with scholars a similar 'user time' frame? Do other audiences benefit from embedded and standalone and linear and nonlinear resources in the same way scholars do? Do other audiences pay the same attention to formatting and scaling of artworks images? In what ways their personal backgrounds frame their interpretation, what meaning-making strategies they use, and what are their reading strategies compared to the ones of scholars?

Regarding digital authorship in the museum, the mismatch between what museums expect from their curators and what digital art history proposes in terms of curatorial professional development, asks for additional research. It is thought that digital humanities skills related to computational visual analysis, metadata analysis and visualisation can foster different narratives to be ultimately presented in online resources. Yet, museums with projects that require those skills are a minority. A more in-depth and detailed account of the required digital skills for curators in museums—possibly worldwide—is needed in order to draw comparisons between the proposed curriculum of digital art history workshops and courses and to identify the gaps relative to museums needs and technological possibilities in the digital scholarship milieu.

The findings have shown that there is an overall lack of agreement on the best preservation approaches for online resources—that also extends to general museum websites and online collections. Attention should be put on comprehensively studying the preservation methods museums currently use, in addition to the audience expectations and needs in this regard. As previously stated, some of the practices this thesis author has observed are the development of digital preservation strategies that preserve the source code and the interface of the online resource, the usage more stable technologies that prevent resources to be rapidly outdated, or the renovation of the resource. Yet, these are not used consistently by all institutions.

Concerning story space and time, findings are not extensive although denote the difficulties of digitally representing historical uncertainty, in particular, space and time accurately with digital means. To investigate the subject more attention should be paid to the technologies used to represent historical time and space and its use with a focus on observing specific demands, procedures, decision-making processes, and principles underlying representations.

6.3 What is next for online resources?

The thesis as a whole makes the case for art museums' online resources to push the boundaries of what can be done with digital media to tell stories online. Online resources have the potential to become even more transparent, multivocal, open, evolving, spatially flexible, visual, relevant to different audiences. Online resources can be as well less tied to the print publication and physical exhibition models, and instead, they can adopt attributes that belong to both models. Online resources can also foster and enhance meaning-making and favour new reading strategies. This research shows that both scholars and museums agree on all this potential. However, the thesis also reveals the impediments museums encounter and the challenges they face when developing online resources. This implies that a more profound institutional shift is still needed, so the change can continue to be effectuated in the museum digital ecosystem. This thesis should also invite art museums to take more risks in terms of scholarly digital discourses. Although there is an ongoing change process in institutions in this regard, more could be done. The research shows that some of the attributes of general audience oriented resources are relevant to scholars if customised to their research and teaching needs and practices. Scholars appreciate the interface aesthetics, high visibility, and multimediality of non scholarly resources. Lastly, it should be stressed that the narrative approach this thesis employs can be embedded into practice. The conception of online resources as narratives is presented as an opportunity for museums not only to critically examine their own practices but also to adopt a creative approach to their work and transform how museums tell stories online. Despite the popularity of digital storytelling, museums' online resources that claim to be pushing the boundaries of digital storytelling very often explore just one facet of the multiple options available. Much can be learnt from narratology theoretical concepts and narratives in other media and domains—including journalism, digital literature, digital arts, games, time-based arts—that apply to museums online resources.

Appendix A

Survey of art museums' online resources

Resource Name	Link	Institution	Country	Year	Type	Author	Voice	Media	Space	Temporality	Linearity	Embedded or Standalone	Implied Audience
Building the Picture. Architecture in Italian Renaissance Painting	http://www.nationalgallery.org.uk/exhibitions/research/exhibition-catalogues/building-the-picture/	The National Gallery London	UK	2014	Scholarly Exhibition Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging) video	2D	Permanent	Non-linear	Embedded	Scholars and Students
Raphael Research Resource	http://www.nationalgallery.org.uk/documentation/index.php	The National Gallery, London + several museums	UK	2007	Scholarly Resource	Museum	Third	Text Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Verso	http://www.artists.org/verso/museum/info/verso/info/verso-what-is-the-backstory/	Minneapolis Institute of Art	US	2012	Publication	Museum	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	General Public
Bosch. A story in pictures	https://www.museodelprado.es/en/abrir-espacios/museo-del-prado-bosch-a-story-in-pictures-2016-2017-62482482-62482482	Museo Del Prado	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging)	2D	Permanent	Linear	Embedded	General Public
Clara Peeters. Una historia en imágenes	https://www.museodelprado.es/en/abrir-espacios/exhibiciones/the-art-of-clara-peeters-1642-1664-9761-62482482-62482482	Museo Del Prado	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging)	2D	Permanent	Linear	Embedded	General Public
Las Hilanderas. Una Historia en imágenes	https://www.museodelprado.es/en/abrir-espacios/exhibiciones/la-hilanderas-a-journey-to-the-edges-of-art-1600-1700-62482482-62482482	Museo Del Prado	Spain	2017	Interactive feature	Museum	Third	Text Image (advanced imaging)	2D	Permanent	Linear	Embedded	General Public
Goya en el Prado	https://www.museodelprado.es/en/	Museo del Prado	Spain	2015	Scholarly Catalogue	Museum	Third	Text Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Impresionismo Americano	http://www.museothyssen.com/ingles/exposiciones/2014/impresionismo-americano/v/index_in.htm	Museo Thyssen Bornemiza	Spain	2014	Exhibition website	Museum	Third	Text Image	3D	Permanent	Non-linear	Standalone	General Public
Heilbrunn Timeline of Art History	http://www.metmuseum.org/taah/	Metropolitan Museum of Art	US	2000	Publication	Curator, Scholar	Third	Text (long form) Image Diagrams	2D	Permanent	Non-linear	Standalone	Students
MetCollects	http://www.metmuseum.org/collection/metcollects	Metropolitan Museum of Art	US	2014	Interactive feature	Curator	Third	Text Image (advanced imaging) video	2D	Permanent	Non-linear	Standalone	General Public
Connections	https://www.metmuseum.org/exhibitions/	Metropolitan Museum of Art	US	2011	Interactive feature	Curator, Museum staff	First	Text Image (advanced imaging) video Diagrams	2D	Permanent	Non-linear	Standalone	General Public
One Met. Many Worlds	https://www.metmuseum.org/one-many-worlds/	Metropolitan Museum of Art	US	2014	Interactive feature	Curator	Third	Text Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	General Public
The Artist Project	http://artistsproject.metmuseum.org/	Metropolitan Museum of Art	US	2016	Interactive feature	Artist	First	Text Image video	2D	Episodic	Linear/Non-linear	Standalone	General Public
#Metkids	https://www.metmuseum.org/taah/online/tutorials/metkids/	Metropolitan Museum of Art	US	2015	Interactive feature	Curator, Audience	Third, First, Second	Text Image Video Diagrams	2D	Permanent	Non-linear	Standalone	Children
82nd & Fifth	https://82ndandfifth.metmuseum.org/	Metropolitan Museum of Art	US	2013	Interactive feature	Curator	First	Text Image (advanced imaging) video	2D	Episodic	Linear/Non-linear	Standalone	General Public
Catalogue of Drawings by Rembrandt and his School in the British Museum	http://www.britishmuseum.org/research/publications/online_research_catalogues/collections_of_drawings_by_rembbrandt.aspx	British Museum	UK	2009	Scholarly Catalogue	Curator	Third	Text (Long form) Image (advanced imaging)	2D	Permanent	Non-linear	Embedded	Scholars and Students
A catalogue of the Russian icons in the British Museum	http://www.britishmuseum.org/research/publications/online_research_catalogues/collections_of_russian_icons.aspx	British Museum	UK	2008	Scholarly Catalogue	Curator	Third	Text (Long form) Image (advanced imaging)	2D	Permanent	Non-linear	Embedded	Scholars and Students
Intinerancias	http://www.museoreinasofia.es/temas/tema-intinerancias/	Museo Reina Sofia	Spain	2015	Interactive feature	Museum	Third	Diagrams	2D	Episodic	Non-linear	Standalone	General Public
Rethinking Guernica	https://guernica.museoreinasofia.es/en	Museo Reina Sofia	Spain	2017	Interactive feature	Museum	Third	Text Image (Advanced Imaging) Diagrams	2D	Permanent	Linear/Non-linear	Standalone	General Public
Featured artwork: "He Disappeared into Complete Silence" Louise Bourgeois	http://www.museoreinasofia.es/en/exposiciones/2016	Museo Reina Sofia	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Featured artwork: "Livro da Criação" Lygia Pape	http://www.museoreinasofia.es/en/exposiciones/2016	Museo Reina Sofia	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Featured artwork: "Wall Drawing #47" Sol LeWitt	http://www.museoreinasofia.es/en/featured-artist/sol-lewitt	Museo Reina Sofia	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Featured artwork: "para verte mejor, américa latina" Paolo Gasparini	http://www.museoreinasofia.es/en/featured-artist/paolo-gasparini	Museo Reina Sofia	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Featured artwork: "Posters" Martin Kippenberger	http://www.museoreinasofia.es/en/featured-artist/martin-kippenberger	Museo Reina Sofia	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Featured artwork: "Medals for Dishonor" David Smith	http://www.museoreinasofia.es/en/featured-artist/david-smith	Museo Reina Sofia	Spain	2016	Interactive feature	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Dutch Paintings of the Seventeenth Century	http://www.nationalgallery.org.uk/exhibitions/dutch-paintings-of-the-seventeenth-century/	National Gallery of Art Washington DC	US	2014	Scholarly Catalogue	Curator	Third	Text (long form) Image (advanced imaging) video	2D	Permanent	Non-linear	Embedded	Scholars and Students

Resource Name	Link	Institution	Country	Year	Type	Author	Voice	Media	Space	Temporality	Linearity	Embedded or Standalone	Implied Audience
Italian Paintings of the Thirteenth and Fourteenth Centuries	http://www.nga.gov/content/ngaweb/Research/Research/italian_paintings_of_the_thirteenth_and_fourteenth_centuries.html	National Gallery of Art Washington DC	US	2016	Scholarly Catalogue	Curator	Third	Text (long form) Image video	2D	Permanent	Non-linear	Embedded	Scholars and Students
American Paintings, 1900–1945	http://www.nga.gov/content/ngaweb/Research/Research/american_paintings_1900_1945.html	National Gallery of Art Washington DC	US	2016	Scholarly Catalogue	Curator	Third	Text (long form) Image (advanced imaging) video	2D	Permanent	Non-linear	Embedded	Scholars and Students
The Camden Town Group in Context	http://www.tate.org.uk/art/research/publications/camden-town-group	Tate	UK	2012	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image	2D	Permanent	Non-linear	Embedded	Scholars and Students
The Art of the Sublime	http://www.tate.org.uk/art/research/publications/the-sublime	Tate	UK	2012	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image	2D	Permanent	Non-linear	Embedded	Scholars and Students
J.M.W. Turner: Sketchbooks, Drawings and Watercolours	http://www.tate.org.uk/art/research/publications/jmw-turner	Tate	UK	2012	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image	2D	Permanent	Non-linear	Embedded	Scholars and Students
Henry Moore: Sculptural Process and Public Identity	http://www.tate.org.uk/art/research/publications/henry-moore	Tate	UK	2012	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image	2D	Permanent	Non-linear	Embedded	Scholars and Students
Performance at Tate: Into the Space of Art	http://www.tate.org.uk/art/research/publications/performance-at-tate	Tate	UK	2015	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image Diagram	2D	Permanent	Non-linear	Embedded	Scholars and Students
Tate Time Machine	http://timemachine.tate.org.uk/home/content/timemach.html	Tate	UK	2016	Interactive feature	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
Ancient Carved Ambers in the J. Paul Getty Museum	http://www.getty.edu/publications/amber/	J. Paul Getty Museum	US	2012	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Ancient Terracottas from South Italy and Sicily	http://www.getty.edu/publications/terracottas/	J. Paul Getty Museum	US	2016	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging) Diagrams	2D	Permanent	Non-linear	Standalone	Scholars and Students
Roman Mosaics in the J. Paul Getty Museum	http://www.getty.edu/publications/romanmosaics/	J. Paul Getty Museum	US	2016	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging) Diagrams	2D	Permanent	Non-linear	Standalone	Scholars and Students
Ancient Lamps in the J. Paul Getty Museum	http://www.getty.edu/publications/ancientlamps/	J. Paul Getty Museum	US	2017	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Southeast Asian Art Catalogue	http://seasian.catalog.lacma.org/	The Los Angeles County Museum of Art	US	2012	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Rauschenberg Research Project	http://www.sfmoma.org/rauschenberg/collectors/works-of-rauschenberg_research_project	SFMOMA	US	2013	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear/Non-linear	Embedded	Scholars and Students
Catalog of Chinese Painting and Calligraphy	http://www.seattleartmuseum.org/online/collections/ChinesePaintingandCalligraphy/	Seattle Art Museum	US	2011	Scholarly Catalogue	Curator, Scholar, Audience	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Caillebotte Paintings and Drawings at the Art Institute of Chicago	https://publications.artic.edu/publications/reader/julien-caillebotte	Art Institute of Chicago	US	2015	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
Whistler and Roussel: Linked Visions	https://publications.artic.edu/publications/reader/julien-whistler-roussel	Art Institute of Chicago	US	2015	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
Pissarro Paintings and Works on Paper at the Art Institute of Chicago	https://publications.artic.edu/publications/reader/julien-pissarro	Art Institute of Chicago	US	2015	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
James Ensor: The Temptation of Saint Anthony	https://publications.artic.edu/publications/reader/julien-ensor	Art Institute of Chicago	US	2015	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
Monet Paintings and Drawings at the Art Institute of Chicago	https://publications.artic.edu/publications/reader/julien-monet	Art Institute of Chicago	US	2014	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
Renoir Paintings and Drawings at the Art Institute of Chicago	https://publications.artic.edu/publications/reader/julien-renoir	Art Institute of Chicago	US	2014	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
The Modern Series at the Art Institute of Chicago	https://publications.artic.edu/publications/reader/julien-modern-series	Art Institute of Chicago	US	2016	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image (advanced imaging)	2D	Permanent	Linear	Standalone	Scholars and Students
The world of the Japanese illustrated book	http://www.amsackler.com/	the Arthur M. Sackler and Freer Gallery of Art	US	2014	Scholarly Catalogue	Curator, Scholar, Printmaker	Third	Text (long form) Image (advanced imaging) Video Diagrams	2D	Permanent	Non-linear	Standalone	Scholars and Students
Online Scholarly Catalogues	http://www.amsackler.com/	the Arthur M. Sackler and Freer Gallery of Art	US	2014	Scholarly Catalogue	Museum	Third	Text (long form) Image (advanced imaging) Diagrams	2D	Permanent	Non-linear	Standalone	Scholars and Students
Online Scholarly Catalogues	http://www.amsackler.com/	the Arthur M. Sackler and Freer Gallery of Art	US	2008	Scholarly Catalogue	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	Scholars and Students
Living Collections Catalogue	http://www.walkerart.org/collections/publications/art-exposed	the Walker Art Center	US	2015	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image	2D	Permanent	Linear/Non-linear	Standalone	Scholars and Students

Resource Name	Link	Institution	Country	Year	Type	Author	Voice	Media	Space	Temporality	Linearity	Embedded or Standalone	Implied Audience
Living Collections Catalogue	http://www.walkerart.org/interactives/subscriptions/andromeda	the Walker Art Center	US	2014	Scholarly Catalogue	Curator, Scholar	Third	Text (long form) Image	2D	Permanent	Linear/Non-linear	Standalone	Scholars and Students
Monet	http://www.monet2010.com	Grand Palais	France	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
Digitorial	http://monet.staedelmuseum.de/en	Städel Museum	Germany	2015	Publication	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Digitorial	http://meisterwerke.staedelmuseum.de/en/	Städel Museum	Germany	2016	Publication	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
Digitorial	http://180x.staedelmuseum.de/en/	Städel Museum	Germany	2015	Publication	Museum	Third	Text Image (advanced imaging) video	2D	Permanent	Linear	Standalone	General Public
ArtStories	http://turnstones.artemis.org/?i	Minneapolis Institute of Arts	US	2014	Digital Exhibition	Museum	Third	Text Image (advanced imaging)	2D	Permanent	Linear	Standalone	General Public
Inventing Abstraction	http://www.moma.org/interactives/exhibitions/2012/inventingabstraction	MoMA	US	2012	Exhibition website	Museum, Curator, Artist	Third, First	Text Image Diagrams Audio Video	2D	Permanent	Linear	Standalone	General Public
One Way Ticket. Jacob Lawrence's Migration Series	https://www.moma.org/interactives/exhibitions/2015/one-way-ticket/	MoMA	US	2015	Exhibition website	Museum, Curator, Scholar, Artist	Third	Text Image Diagrams Video Audio	2D	Permanent	Non-linear	Standalone	General Public
Object/Photo. The Thomas Walther Collection	https://www.moma.org/interactives/objectphoto/thomas	MoMA	US	2014	Scholarly publication	Museum, Scholar	Third	Text (Long form) Image (advanced imaging) Diagrams Video Audio	2D	Permanent	Non-linear	Standalone	Scholars and Students
Henri Cartier-Bresson. The modern century	https://www.moma.org/interactives/exhibitions/2010/henricartierbresson/	MoMA	US	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Artists of Brücke. Themes in German Expressionist Prints	https://www.moma.org/interactives/exhibitions/2002/brucke/	MoMA	US	2002	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Design and the Elastic Mind	https://www.moma.org/interactives/exhibitions/2008/elasticmind/	MoMA	US	2008	Exhibition website	Museum	Third	Text Image Diagram	2D	Permanent	Linear/Non-linear	Standalone	General Public
On line. Drawing through the twentieth century	https://www.moma.org/interactives/exhibitions/2010/online/	MoMA	US	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Gauguin Metamorphoses	https://www.moma.org/interactives/exhibitions/2014/gauguin/	MoMA	US	2014	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Henri Matisse. The Cut-Outs	https://www.moma.org/interactives/exhibitions/2014/matisse-the-cut-outs.html	MoMA	US	2014	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Alibis: Sigmar Polke 1963–2010	https://www.moma.org/interactives/exhibitions/2014/alibis/	MoMA	US	2014	Exhibition website	Museum, Artist, Curator	Third, Second	Text (Long form) Image Video	2D	Permanent	Non-linear	Standalone	General Public
New Photography 2013	https://www.moma.org/interactives/exhibitions/2013/newphotography/	MoMA	US	2013	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Cindy Sherman	https://www.moma.org/interactives/exhibitions/2012/cindysherman/about-the-exhibition/	MoMA	US	2012	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Storylines	http://exhibitions.guggenheim.org/storylines/?_ga=2.24545993.1628877373.1423862392	Guggenheim	US	2015	Exhibition website	Museum	Third	Text Image Diagram	2D	Permanent	Non-linear	Standalone	General Public
On Kawara - Silence	http://exhibitions.guggenheim.org/onkawara/?_ga=2.15527580.1628877373.1423862392	Guggenheim	US	2015	Exhibition website	Museum	Third	Text Image	2D	Episodic	Non-linear	Standalone	General Public
Zero. Countdown to Tomorrow , 1950-60s	http://exhibitions.guggenheim.org/zero/?_ga=2.171327498.1628877373.1423862392	Guggenheim	US	2014	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Italian Futurism. Reconstructing the Universe	http://exhibitions.guggenheim.org/italianfuturism/?_ga=2.165584382.1628877373.1423862392	Guggenheim	US	2014	Exhibition website	Museum	Third	Text Image Diagrams Video	2D	Permanent	Non-linear	Standalone	General Public
James Turrell	http://web.guggenheim.org/exhibitions/turrell/?_ga=2.152963772.1628877373.1423862392	Guggenheim	US	2013	Exhibition website	Museum	Third	Text Image Diagram	2D	Permanent	Linear	Standalone	General Public
Gutai. Splendid Playground	http://web.guggenheim.org/exhibitions/gutai/?_ga=2.15305996.1628877373.1423862392	Guggenheim	US	2013	Exhibition website	Museum	Third	Text Image Video	2D	Permanent	Linear	Standalone	General Public
John Chamberlain. Choices	http://web.guggenheim.org/exhibitions/chamberlain/?_ga=2.22841297.1628877373.1423862392	Guggenheim	US	2012	Exhibition website	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
Art of Another Kind: International Abstraction and the Guggenheim, 1949-1960	http://web.guggenheim.org/exhibitions/artofanotherkind/?_ga=2.22841297.1628877373.1423862392	Guggenheim	US	2012	Exhibition website	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
Lee Ufan. Marking Infinity	http://web.guggenheim.org/exhibitions/leefufan/post-1945/?_ga=2.245281056.1628877373.1423862392	Guggenheim	US	2011	Exhibition website	Museum	Third	Text Image Video	2D	Permanent	Non-linear	Standalone	General Public
Chaos & Classicism: Art in France, Italy, and Germany, 1918-1936	http://web.guggenheim.org/exhibitions/chaos/index-1918-1936/?_ga=2.245281056.1628877373.1423862392	Guggenheim	US	2011	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Haunted: Contemporary Photography, Video, Performance	http://web.guggenheim.org/exhibitions/haunted/?_ga=2.137861112.1628877373.1423862392	Guggenheim	US	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public

Resource Name	Link	Institution	Country	Year	Type	Author	Voice	Media	Space	Temporality	Linearity	Embedded or Standalone	Implied Audience
Anish Kapoor. Memory	http://web.guggenheim.org/exhibitions/anishkapoor/index.html?_af=1_203335673.1628877733.142.2862302	Guggenheim	US	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Frank Lloyd Wright. From within outward	http://web.guggenheim.org/exhibitions/frankloydwright/index.html?_af=1_241581666.1628877733.142.2862302	Guggenheim	US	2009	Exhibition website	Museum, Artist	Third, First	Text Image Audio	2D	Permanent	Non-linear	Standalone	General Public
The Sweeney Decade: Acquisitions at the 1959 Inaugural	http://web.guggenheim.org/exhibitions/sweeneydecade/index.html?_af=1_165593751.1628877733.142.2862302	Guggenheim	US	2009	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
The Third Mind: American Artists Contemplate Asia, 1860-1989	http://web.guggenheim.org/exhibitions/thirdmind/index.html?_af=1_133552086.1628877733.142.2862302	Guggenheim	US	2009	Exhibition website	Museum	Third	Text Image Diagram	2D	Permanent	Non-linear	Standalone	General Public
The any space whatever	http://web.guggenheim.org/exhibitions/any-space/index.html?_af=1_166580158.1628877733.142.2862302	Guggenheim	US	2009	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Catherine Opie. American Photographer	http://web.guggenheim.org/exhibitions/catherineopie/index.html?_af=1_131627778.1628877733.142.2862302	Guggenheim	US	2009	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Cai Guo-Qiang. I want to believe	http://exhibitions.guggenheim.org/exhibitions/cgq/index.html	Guggenheim	US	2008	Exhibition website	Museum	Third	Text Image	2D/3D	Permanent	Non-linear	Standalone	General Public
Ai Weiwei 360	https://www.royalacademy.org.uk/exhibitions/ai-weiwei-360?utm_source=rafter&utm_medium=email&utm_campaign=360&utm_term=.W360	Royal Academy of Art	UK	2016	Online exhibition	Museum	Third	Text Image	3D	Temporal	Non-linear	Standalone	General Public
Kenneth Tyler Printmaking Collection	http://nga.gov.au/Exhibitions/Prints/Tyler/default.htm	National Gallery of Art Australia	Australia	-	Scholarly resource	Museum	Third	Text (Long form) Image Video	2D	Permanent	Non-linear	Embedded	General Public
Tom Robert Exhibition	http://nga.gov.au/Exhibitions/Robert/	National Gallery of Art Australia	Australia	2016	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Au Royaume d'Alexandre le Grand	http://galvanandre-le-grand.louvre.fr/	Musée du Louvre	France	2012	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Rembrandt e la Figure du Christ	http://rembrandt.louvre.fr/	Musée du Louvre	France	2011	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Claude le Lorrain. Le desinateur face à la nature	http://claudelorrain.louvre.fr/	Musée du Louvre	France	2011	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Sainte Russie	http://mini-site.louvre.fr/sainte-russie/index_f.html	Musée du Louvre	France	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Titien, Tintoret, Véronèse. Rivalités à Venise	http://mini-site.louvre.fr/veronese-tintoret-titian.html	Musée du Louvre	France	2010	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Breguet au Louvre	http://mini-site.louvre.fr/breguet/index.html	Musée du Louvre	France	2009	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Les Portes du Ciel	http://mini-site.louvre.fr/portesduciel/	Musée du Louvre	France	2009	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Mantegna	http://mini-site.louvre.fr/mantegna/index.html	Musée du Louvre	France	2009	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Babylone	http://mini-site.louvre.fr/babylone/index_f.html#accueil	Musée du Louvre	France	2008	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Trois Empires de l'islam	http://mini-site.louvre.fr/trois-empires/index_f.html	Musée du Louvre	France	-	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Praxitèle. Un maître de l'esculpture antique	http://mini-site.louvre.fr/praxitelle/index_f.html	Musée du Louvre	France	2007	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Minnesota by Design	http://www.walkerart.org/minnesotadesign	Walker Art Center	US	2016	Online exhibition	Museum	Third	Text Image Diagram	2D	Permanent	Non-linear	Standalone	General Public
TimeWeb	http://timeweb.warhol.org/2006	Warhol Museum	US	2006	Interactive feature	Museum	Third	Text Image Diagram	2D	Permanent	Non-linear	Standalone	General Public
Virtual Academy	http://www.hermitage.ru/modules.php?name=Virtual_Academy	Hermitage	Russia	-	Interactive feature	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Virtual Academy	http://www.hermitage.ru/modules.php?name=Virtual_Academy	Hermitage	Russia	2012	Interactive feature	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Virtual Academy	http://www.hermitage.ru/modules.php?name=Virtual_Academy	Hermitage	Russia	2013	Interactive feature	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Joseph Beuys Multiples	http://www.pinakothek-beuys.de/index.html	Pinakothek der Moderne Munich	Germany	2014	Exhibition website	Museum	Third	Text (Long form) Image	2D	Permanent	Linear/Non-linear	Standalone	General Public
Painting Techniques of Impressionism and Postimpressionism	http://www.museeobolshoi.de/impresionismus/info_4.html?lang=en&page=Kunst-818-818	Wallraf-Richartz-Museum	Germany	2008	Scholarly Catalogue	Museum	Third	Text Image (Advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Stories	http://www.vangoghmuseum.nl/en/stories	Van Gogh Museum	Netherlands	2015	Interactive feature	Museum	Third	Text Image (Advanced imaging)	2D	Permanent	Linear	Standalone	General Public
4 Stories	http://4stories.mcachicago.org/	MCA Chicago	US	2016	Interactive feature	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
4 Stories	http://4stories.mcachicago.org/2015/issue7_salcedo_museo.html	MCA Chicago	US	2015	Interactive feature	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
4 Stories	http://4stories.mcachicago.org/2014/issue1/	MCA Chicago	US	2014	Interactive feature	Museum	Third	Text Image	2D	Permanent	Linear	Standalone	General Public
Doris Salcedo	http://www3.mcachicago.org/2015/issue7/	MCA Chicago	US	2015	Exhibition website	Museum	Third	Text (long form) Image Video	2D	Permanent	Linear/Non-linear	Standalone	General Public
Kerry James Marshall: Mastry	https://exhibitions.mcachicago.org/2016/	MCA Chicago	US	2016	Exhibition catalogue	Museum	Third	Text (long form) Image	2D	Permanent	Non-linear	Standalone	General Public
Lang Shining	http://theme.npm.edu.tw/foamaw/d2/angshining/	The Palace Museum (Taipei)	China	2015	Online Exhibition	Museum	Third	Text Image	2D	Permanent	non-linear	Standalone	General Public
Fragrance Fills the Courtyard: Chinese Flower Paintings Through the Ages	https://www.npm.gov.tw/foamaw/d2/flowers/	The Palace Museum (Taipei)	China	2011	Online Exhibition	Museum	Third	Text Image	2D	Permanent	non-linear	Standalone	General Public
Dynastic Renaissance: Art and Culture of the Southern Song	http://www.npm.gov.tw/foamaw/d2/southern-song.html	The Palace Museum (Taipei)	China	2010	Online Exhibition	Museum	Third	Text Image	2D	Permanent	non-linear	Standalone	General Public
Tracing the Che School in Chinese Painting	http://tech2.npm.edu.tw/che-school/	The Palace Museum (Taipei)	China	-	Online Exhibition	Museum	Third	Text Image Diagram	2D	Permanent	non-linear	Standalone	General Public
Nacho López. El fotógrafo de México	http://museoelpalaciodebellasartes.com/Exposiciones/Nacho_Lopez/index.html	Museo del Palacio de Bellas Artes	Mexico	2016	Exhibition Website	Museum	Third	Text Image Audio	2D	Permanent	Non-linear	Standalone	General Public

Resource Name	Link	Institution	Country	Year	Type	Author	Voice	Media	Space	Temporality	Linearity	Embedded or Standalone	Implied Audience
Vanguardia Rusa. El Vértigo del Futuro	http://museopalaciobellasartes.edu.mx/exposicion/vanguardia-rusa/	Museo del Palacio de Bellas Artes	Mexico	2016	Exhibition Website	Museum	Third	Text Image Audio Video	2D	Permanent	Non-linear	Standalone	General Public
Henri Cartier-Bresson. La mirada del siglo	http://museopalaciobellasartes.edu.mx/exposicion/henricartierbresson/ftso.php	Museo del Palacio de Bellas Artes	Mexico	2015	Exhibition Website	Museum	Third	Text Image Audio	2D	Permanent	Linear/Non-linear	Standalone	General Public
Nosotros Fuimos. Grandes Estudios Fotográficos de la Ciudad de México	http://museopalaciobellasartes.edu.mx/exposicion/nosotros-fuimos	Museo del Palacio de Bellas Artes	Mexico	2015	Exhibition Website	Museum	Third	Text Image Audio	2D	Permanent	Linear/Non-linear	Standalone	General Public
Picasso revelado por Davis Douglas Duncan	http://museopalaciobellasartes.edu.mx/exposicion/picasso/	Museo del Palacio de Bellas Artes	Mexico	2014	Exhibition Website	Museum	Third	Text Image Video	2D	Permanent	Linear	Standalone	General Public
Robert Doisneau. La belleza de lo cotidiano	http://museopalaciobellasartes.edu.mx/exposicion/robertdoisneau/	Museo del Palacio de Bellas Artes	Mexico	-	Exhibition Website	Museum	Third	Text Image Video	2D	Permanent	Linear	Standalone	General Public
Louise Bourgeois. Petite Maman	http://museopalaciobellasartes.edu.mx/exposicion/lb/	Museo del Palacio de Bellas Artes	Mexico	2014	Exhibition Website	Museum	Third	Text Image Video	2D	Permanent	Linear	Standalone	General Public
Exposición Grandes Modernos Colección Peggy Guggenheim, Venecia Arte del siglo XX	http://exposiciones.museocondeminas.cl/ingles-ingles-ingles-ingles-ingles/	Centro Cultural La Moneda	Chile	2012	Exhibition website	Museum	Third	Text Image	2D	Permanent	Non-linear	Standalone	General Public
Illusions	http://www.illusions.ca/daros.net	Casa Daros	Brazil	2014	Exhibition website	Museum	Third	Text Image (Advanced imaging) Video	2D	Permanent	Linear	Standalone	General Public
The Boxwood Project	http://boxwood.ago.ca/	Art Gallery of Ontario	Canada	2016	Scholarly Catalogue	Museum	Third	Text (long form) Image (Advanced imaging)	2D	Permanent	Non-linear	Embedded	Scholars and Students
Clyfford Still: Works on Paper	http://pubs.clyffordstillmuseum.org/works-on-paper/	Clyfford Still Museum	US	2016	Scholarly Catalogue	Museum	Third	Text (long form) Image (Advanced imaging)	2D	Permanent	Non-linear	Standalone	Scholars and Students
Now Dig This!: Art and Black Los Angeles 1960–1980	https://hammer.ucla.edu/now-dig-this/	Hammer Museum	US	2016	Scholarly Catalogue	Curator	Third	Text (long form) Image	2D	Permanent	Non-linear	Embedded	Scholars and Students

Bibliography

82nd & Fifth. 2013. Metropolitan Museum of Art. Visited on 10/13/2017.

<https://82nd-and-fifth.metmuseum.org/>.

Aarseth, Espen J. 1997. *Cybertext. Perspectives in Ergodic Literature*. Baltimore: The John Hopkins University Press.

Abbott, H. Porter. 2013. "Narrativity". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019.

<https://wikis.sub.uni-hamburg.de/lhn/index.php/Narrativity>.

—. 2007. "Story, plot, and narration". In *The Cambridge companion to narrative*, ed. by David Herman. Cambridge: Cambridge University Press.

Achiam, Marianne, Michael May, and Martha Marandino. 2014. "Affordances and distributed cognition in museum exhibitions". *Museum Management and Curatorship* 29 (5): 461–481. doi:10.1080/09647775.2014.957479.

Aczel, Richard. 2005. "Voice". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.

Albers, Greg. 2017. "Bringing books online". *MW2017: Museums and the Web 2017*. Visited on 05/30/2019. <https://mw17.mwconf.org/paper/the-next-generation-of-online-publishing-building-on-what-weve-learned-together/>.

Andrews, Molly, Corinne Squire, and Maria Tamboukou, eds. 2008. *Doing Narrative Research*. Thousand Oaks, CA: SAGE.

Anmarkrud, Øistein, et al. 2013. "Task-oriented reading of multiple documents: online comprehension processes and offline products". *Instructional Science* 41 (5): 873–894. doi:10.1007/s11251-013-9263-8.

"Atlas, n.1". 2017. In *OED Online*. Oxford: Oxford University Press. Visited on 05/30/2019. <http://www.oed.com.ezproxy.lib.gla.ac.uk/view/Entry/12536?rskey=v3vM93&result=8>.

- Austin, Tricia. 2012. "Scales of Narrativity". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- Ayres, Lioness. 2008. "Semi-Structured Interview". In *The SAGE Encyclopedia of Qualitative Research Methods*, ed. by Lisa M. Given, 811–812. Thousand Oaks, CA: SAGE.
doi:10.4135/9781412963909.n420.
- Baca, Murtha, and Nuria Rodríguez-Ortega. 2015. "Pietro Mellini's Inventory in Verse, 1681: A Digital Facsimile with Translation and Commentary". *Getty Research Institute* (Los Angeles). Visited on 05/30/2019. <http://hdl.handle.net/10020/mellini>.
- Baetens, Jan. 2003. "Illustrations, images, and anti-illustrations". In *Eloquent Images: Word and Image in the Age of New Media*, ed. by Mary E. Hocks and Michelle R. Kendrick. Cambridge, MA: MIT Press.
- Bal, Mieke. 1996a. *Double exposures : the subject of cultural analysis*. New York: Routledge.
- . 2007. "Exhibition as film". In *Exhibition experiments*, ed. by Sharon Macdonald and Paul Basu. Malden MA: Blackwell.
- . 2001. *Looking In: The Art of Viewing: with an introduction by Norman Bryson*. Amsterdam: G&B Arts International.
- . 2017 (1985). *Narratology: Introduction To The Theory Of Narrative*. Toronto: University of Toronto Press.
- . 2004. "Telling Objects: A Narrative Perspective on Collecting". In *Grasping the World: The Idea of the Museum*, ed. by D. Preziosi and C. Farago, 84–102. Burlington: Ashgate.
- . 1992. "Telling, Showing, Showing off". *Critical Inquiry* 18 (3): 556–594.
- . 1996b. "The discourse of the museum". In *Thinking about exhibitions*, ed. by Bruce W. Ferguson Reesa Greenberg and Sandy Nairne, 201–218. London and New York: Routledge.
- Bal, Mieke, and Norman Bryson. 1991. "Semiotics and Art History. Original title: Semiotika i istorija umetnosti". *The Art Bulletin* LXXIII (2): 174–208.
- Ballon, Hilary, and Meriet Westermann. 2006. *Art History and its Publications in an Electronic Age*. Washington, D.C.: Council on Library & Information Resources / Houston, Tex.: Rice University Press. Visited on 05/30/2019.
<http://cnx.org/content/col110376/1.1/>.
- Barnes, Sally-Anne, et al. 2018. *Mapping the Museum. Digital Skills Ecosystem, Phase One Report*. Leicester: University of Leicester. Visited on 05/30/2019. https://lra.le.ac.uk/bitstream/2381/41572/2/One%5C%20by%5C%20ne_Phase1_Report.pdf.
- Barthes, Roland. [1972] 1991. *Mythologies*. New York: The Noonday Press.

- . [1967] 1977. “The Death of the Author”. In *Image, Music, Text*, 142–48. New York: Hill & Wang.
- Barthes, Roland, and Lionel Duisit. 1975. “An Introduction to the Structural Analysis of Narrative”. *New Literary History* 6 (2): 237–272.
- Beudet, David, Alan Newman, and Kenneth Fleisher. 2014. “IIPImage Case Study: National Gallery of Art, Washington”. Visited on 05/30/2019.
<http://iipimage.sourceforge.net/2014/05/iipimage-case-study-national-gallery-of-art-washington/>.
- Beaudoin, Joan. 2005. “Image and Text: A Review of the Literature Concerning the Information Needs and Research Behaviors of Art Historians”. *Art Documentation: Journal of the Art Libraries Society of North America* 24 (2): 34–37.
- Bedford, Leslie. 2001. “Storytelling: The Real Work of Museums”. *Curator* 44 (1): 27–34.
doi:10.1111/j.2151-6952.2001.tb00027.x.
- . 2014. *The Art of Museum Exhibitions. How Story and Imagination Create Aesthetic Experiences*. Walnut Creek, CA: Left Coast Press.
- Benjamin, Walter. 2004. “The work of art in the age of mechanical reproduction”. In *The nineteenth-century visual culture reader*, ed. by Vanessa R. Schwartz and Jeannene M. Przyblyski. London: Routledge.
- Besser, Howard. 1997. “The Transformation of the Museum and the Way It’s Perceived”. In *The wired museum: emerging technology and changing paradigms*, ed. by Katherine Jones-Garmil. Washington, D.C.: American Association of Museums. Visited on 05/30/2019.
<http://besser.tsoa.nyu.edu/howard/Papers/newpapers/transformation.html>.
- “Best of the Web Awards 2013 nominees: Museums and the Web 2013 conference website”. 2013. Visited on 05/30/2019.
<https://web-beta.archive.org/web/20160221192828/http://mw2013.museumsandtheweb.com/best-of-the-web-nominees>.
- Birchall, Danny, and Anna Faherty. 2016. “Big and slow: Adventures in digital storytelling”. *MW2016: Museums and the Web 2016*. Visited on 05/30/2019.
<http://mw2016.museumsandtheweb.com/paper/big-and-slow-adventures-in-digital-storytelling/>.
- Bishop, Claire. 2017. “Against Digital Art History”. In *Humanities Futures, Franklyn Humanities Institute*. Visited on 05/30/2019.
<https://humanitiesfutures.org/papers/digital-art-history/>.
- Bitgood, Stephen. 2014. *Engaging the Visitor: Designing Exhibits That Work*. Edinburgh, Boston: MuseumsEtc.

- Black, Graham. 2005. *The engaging museum: developing museums for visitor involvement*. London: Routledge.
- Bolter, Jay David, and Richard Grusin. 2000. *Remediation: Understanding New Media*. MIT Press: Cambridge, MA.
- Bortolussi, Marisa, and Peter Dixon. 2003. *Psychonarratology. Foundations for the Empirical Study of Literary Response*. Cambridge: Cambridge University Press.
- Bostock, Mike. 3 of November , 2014. "How To Scroll". In *Mike Bostock. Personal Site*. Visited on 05/30/2019. <https://bost.ocks.org/mike/scroll/>.
- Bourdieu, Pierre, and Alain Darbel. 1991. *The Love of Art: European Art Museums and Their Public*. Cambridge: Polity Press.
- Boyd Davis, Stephen, Olivia Vane, and Florian Kräutli. 2016. "Using Data Visualisation to tell Stories about Collections". In *Proceedings of EVA London*, ed. by G. Diprose & N. Lambert J. P. Bowen. London: BCS Learning / Development Ltd. Visited on 05/30/2019. <http://ewic.bcs.org/content/ConWebDoc/56286>.
- Branch, John. 2012. "Snow fall. The avalanche of Tunnel Creek". In *The New York Times*. Visited on 05/30/2019. <http://www.nytimes.com/projects/2012/snow-fall/#/?part=tunnel-creek>.
- Brejcha, Jan. 2015. *Cross-Cultural Human-Computer Interaction and User Experience Design*. Boca Raton, FL: CRC Press.
- Brookey, Robert, and Jonathan Gray. 2017. "'Not merely para': continuing steps in paratextual research". *Critical Studies in Media Communication* 34 (5): 101–110. doi:10.1080/15295036.2017.1312472.
- Buchholz, Sabine, and Manfred Jahn. 2005. "Space in narrative". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- Building the Picture. Architecture in Italian Renaissance Painting*. 2014. National Gallery. Visited on 10/13/2017. <https://www.nationalgallery.org.uk/paintings/research/exhibition-catalogues/building-the-picture>.
- Byrd, Dana E. 2015. *Review of Object:Photo, The Thomas Walther Collection Mitra Abbaspour, Lee Ann Daffner, and Maria Morris Hambourg, eds. New York: Museum of Modern Art, 2014*. Modern Photographs from the Thomas Walther Collection, 1909-1949. Exhibition schedule: Museum of Modern Art, New York, December 13, 2014-April 19. doi:10.3202/caa.reviews.2016.32.

- Campbell, Caroline. 26 of April, 2014. "Building the catalogue: the National Gallery and digital publishing". In *Apollo Magazine*. Visited on 05/30/2019.
<https://www.apollo-magazine.com/building-catalogue/>.
- Catalogues in the Digital Age. A Final Report on the Getty Foundation's Online Scholarly Catalogue Initiative (OSCI)*. 2017. Los Angeles, CA: Getty Foundation. Visited on 05/30/2019. <https://www.getty.edu/publications/osci-report/>.
- Chadwick, John, and Patricia Boverie. 1999. "A survey of characteristics and patterns of behavior in visitors to a museum web site". Ed. by D. Bearman and J. Trant. *Museums and the Web 1999*. Pittsburgh, PA: Archives & Museum Informatics, visited on 05/30/2019, <http://www.archimuse.com/mw99/papers/chadwick/chadwick.html>.
- Charters, Elizabeth. 2003. "The Use of Think-aloud Methods in Qualitative Research An Introduction to Think-aloud Methods". *Brock Education Journal* 12 (2). Visited on 05/30/2019. <http://dx.doi.org/10.1111/cura.12011>.
- Chatman, Seymour. 1978. *Story and Discourse. Narrative Structure in Fiction and Film*. Ithaca, London: Cornell University Press.
- Cho, Byeong-Young. 2014. "Competent Adolescent Readers Use of Internet Reading Strategies: A Think-Aloud Study". *Cognition and Instruction* 32 (3): 253–289.
doi:10.1080/07370008.2014.918133.
- Coiro, Julie. 2017. "Talking About Reading as Thinking: Modeling the Hidden Complexities of Online Reading Comprehension". *Theory Into Practice* 50 (2): 107–115.
doi:10.1080/00405841.2011.558435.
- Corbin, Juliette, and Anselm Strauss. 2008. *Basics of Qualitative Research : Techniques and Procedures for Developing Grounded Theory*. Thousand Oaks, CA: SAGE.
- Coulter, Cathy A., and Mary Lee Smith. 2009. "The Construction Zone: Literary Elements in Narrative Research". *Educational Researcher* 38 (8): 577–590.
doi:10.3102/0013189X09353787.
- Crane, Gregory. 2003. "Historical Perspectives on the book and information technology". In *Rethinking Media Change: The Aesthetics of Transition*, ed. by David Thorburn and Henry Jenkins, 116–136. Cambridge, MA: MIT Press.
- Cronin, Blaise. 2014. "Foreword". In *Examining Paratextual Theory and Its Applications in Digital Culture*, ed. by Nadine Desrochers and Daniel Apollon. Pennsylvania: IGI Gopal.
- Cuno, James. 2011. "The discursive museum". In *Museums Matter. In Praise of the Encyclopedic Museum*, 33–56. Chicago: The University of Chicago Press.
- "Definition, n.4". 2018. In *OED Online*. Oxford: Oxford University Press. Visited on 05/30/2019. <http://www.oed.com.ezproxy.lib.gla.ac.uk/view/Entry/48886?redirectedFrom=definition&>.

- del-Río, Nicolás. 2013. "Educational resources in online museums of contemporary art. Typology and scope". *Arte, Individuo y Sociedad* 25 (2): 233–245. doi:10.5209/rev_ARIS.2013.v25.n2.38955.
- Dewdney, Andrew, David Dibosa, and Victoria Walsh. 2013. *Post-critical museology: theory and practice in the art museum*. Abingdon, Oxon: Routledge.
- Digital Humanities for Academic and Curatorial Practice*. 2018. American Academy in Rome. Visited on 05/30/2019. <https://www.aarome.org/event/digital-humanities-academic-and-curatorial-practice>.
- Doering, Zahava D., and Andrew J. Pekarik. 1996. "Questioning the Entrance Narrative". *The Journal of Museum Education. Issue: Determining Museum Effectiveness: Visitor Studies Today* 21 (3): 2–23.
- Drucker, Johanna. 2014. *Graphesis. Visual Forms of Knowledge Production*. Cambridge, MA: Harvard University Press.
- . 2011. "Humanities Approaches to Graphical Display". *Digital Humanities Quarterly* 5 (1). Visited on 05/30/2019. <http://www.digitalhumanities.org/dhq/vol/5/1/000091/000091.html>.
- . 2013. "Performative Materiality and Theoretical Approaches to Interface". *Digital Humanities Quarterly* 7 (1). Visited on 05/30/2019. <http://www.digitalhumanities.org/dhq/vol/7/1/000143/000143.html>.
- Eco, Umberto. 1979. *The Role of the Reader. Explorations in the Semiotics of Texts*. Bloomington: Indiana University Press.
- Engberg, Maria. 2014. "Word-Image". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Ericsson, K. Anders, and Herbert A. Simon. 1993. *Protocol analysis: verbal reports as data*. Cambridge, Mass.; London: MIT Press.
- Everett, Michele, and Margaret S. Barrett. 2009. "Investigating Sustained Visitor/Museum Relationships: Employing Narrative Research in the Field of Museum Visitor Studies". *Visitor Studies* 12 (1): 2–15. doi:10.1080/10645570902769084.
- Falk, John H. 2009. *Identity and the Museum Visitor Experience*. Walnut Creek, CA: Left Coast Press.
- Falk, John H., and Lynn Diane Dierking. 2000. *Learning from Museums: Visitor Experiences and the Making of Meaning*. Lanham, MD: Rowman & Littlefield.
- Featured artworks*. 2016. Museo Nacional Centro del Arte Reina Sofía. Visited on 10/13/2017. <http://www.museoreinasofia.es/en/featured-artworks>.

- Fish, Stanley. 1980. *Is There a Text in This Class? The Authority of Interpretive Communities*. Cambridge, MA: Harvard University Press.
- Fisher, Matthew, Beth A. Twiss-Garrity, and Alexandra Sastre. 2008. "The Art of Storytelling: Enriching Art Museum Exhibits and Education through Visitor Narratives". Ed. by J. Trant and D. Bearman. *Museums and the Web 2008: Proceedings*. Toronto: Archives & Museum Informatics, visited on 05/30/2019, <http://www.archimuse.com/mw2008/papers/fisher/fisher.html>.
- Flick, Uwe. 2010. *An Introduction to Qualitative Research*. London: Sage Publications.
- Fludernik, Monika. 2005a. "Histories of Narrative Theory (II): From Structuralism to the Present". In *A Companion to Narrative Theory*, ed. by James Phelan and Peter J. Rabinowitz, 36–59. Malden, MA: Blackwell.
- . 2005b. "Time in narrative". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- Foucault, Michel. 1984. "What Is an Author?" In *The Foucault Reader*, ed. by Paul Rabinow, 101–123. New York: Pantheon Books.
- Francis, David. 2015. "An Arena Where Meaning and Identity Are Debated and Contested on a Global Scale': Narrative Discourses in British Museum Exhibitions, 1972-2013". *Curator The Museum Journal* 58 (1): 41–58. doi:10.1111/cura.12097.
- Franzosi, Roberto. 2010. *Quantitative narrative analysis*. Thousand Oaks, CA: SAGE.
- Fraser, Annabel, and Hannah Coulson. 2012. "Incomplete stories". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- Freddolini, Francesco, and Anne Helmreich. 2014. "Inventories, catalogues and art historiography: exploring lists against the grain". *Journal of Art Historiography* 11. Visited on 05/30/2019. https://arthistoriography.files.wordpress.com/2014/11/freddolini_helmreich_introduction.pdf.
- Frost, Olivia C. 2002. "When the object is digital : properties of digital surrogate objects and implications for learning". In *Perspectives on Object-Centered Learning in Museums*, ed. by Scott G. Paris. London, New York: Routledge.
- Frykman, Sue Glover. 2009. "Stories to tell? Narrative tools in museum education texts". *Educational Research* 51 (3): 299–319. doi:10.1080/00131880903156898.
- Gabrielli, Caroline. 2015. "Preparing the catalogue raisonné: A guideline for publishing online". *Arts Libraries Journal Special Issue 2 (Catalogues raisonnés, collection catalogues and the future of artwork documentation)* 40:42–49. doi:10.1017/S0307472200000201.

- Gee, Kim. 2001. "The ergonomics of hypertext narrative: usability testing as a tool for evaluation and redesign". *ACM Journal of Computer Documentation* 25 (1): 3–16. doi:10.1145/383948.383950.
- Genette, Gerard. 1972. *Narrative Discourse. An Essay in Method*. Ithaca, NY: Cornell University Press.
- . 1987. *Paratexts: Thresholds of Interpretation*. Cambridge: Cambridge University Press.
- Giebelhausen, Michaela. 2012. "In the museum's ruins: staging the passage of time". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- Giridharadas, Anand. 7 of August, 2014. "Museums See Different Virtues in Virtual Worlds". In *The New York Times*. Visited on 05/30/2019. https://www.nytimes.com/2014/08/08/arts/design/museums-see-different-virtues-in-virtual-worlds.html?_r=0.
- Glaser, Barney G., and Anselm L. Strauss, eds. [1967] 2006. *The Discovery of Grounded Theory Strategies for Qualitative Research*. New Brunswick; London: Aldine Transaction: A Division of Transaction Publishers.
- Golumbia, David. 2014. "The characteristics of digital media". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Goodyear, Anne C. 2016. "The Getty Online Scholarly Catalogue Initiative (OSCI)". In *caa.reviews*. Visited on 05/30/2019. <http://www.caareviews.org/reviews/2880#.W0BEZxIrJE7>.
- Graham, Beryl, and Sarah Cook. 2010. *Rethinking Curating. Art after New Media*. Cambridge, MA: MIT Press.
- Grant, Flora. April 2014. "Approaches to Online Storytelling". In *SFMOMA Blog*. Visited on 05/30/2019. <https://www.sfmoma.org/read/approaches-online-storytelling/>.
- Gray, Johnathan, ed. 2010. *Show Sold Separately: Promos, Spoilers, and Other Media Paratexts*. New York: New York University Press.
- Guillory, John. 2008. "How Scholars Read". *ADE Bulletin* 146:8–17. doi:10.1632/ade.146.8.
- Hall, Stuart. 1999. "Encoding, decoding". In *The cultural studies reader*, ed. by Simon During. London: Routledge.
- . 1997. "The work of representation". In *Representation: Cultural Representations and Signifying Practices*, ed. by Stuart Hall. London: Sage.

- Hayles, N. Katherine, ed. 2012. *How We Think: Digital Media and Contemporary Technogenesis*. Chicago: University of Chicago Press.
- Haynes, Christine. 2005. "Reassessing Genius in Studies of Authorship". *Book History* 8:287–320. doi:10.1353/bh.2005.0006.
- Henning, Michelle. 2006. "New Media". In *A Companion to Museum Studies*, ed. by Sharon Macdonald, 282–301. Malden, MA: Blackwell.
- Herman, David. 2013a. "Cognitive Narratology". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. hup.sub.uni-hamburg.de/lhn/index.php.?title=Cognitive%20Narratology.&oldid=2058.
- . 2013b. *Storytelling and the Sciences of Mind*. Cambridge, MA: MIT Press.
- , ed. 2007. *The Cambridge companion to narrative*. Cambridge: Cambridge University Press.
- Hevey, David. 2010. "Think-aloud methods". In *Encyclopedia of Research Design*, ed. by Neil J. Salkind. Thousand Oaks, CA: SAGE. doi:10.4135/9781412961288.
- Hillier, Bill, and Kali Tzortzi. 2006. "Space Syntax: The Language of Museum Space". In *A Companion to Museum Studies*, ed. by Sharon Macdonald, 282–301. Malden, MA: Blackwell.
- Hocks, Mary E., and Michelle R. Kendrick, eds. 2003. *Eloquent Images: Word and Image in the Age of New Media*. Cambridge, MA: MIT Press.
- Holland, Norman H. 2011 (1975). *The Nature of Literary Response: Five Readers Reading*. New Brunswick, London: Transaction Publishers.
- Honeysett, Nick. 2011. "The Transition to Online Scholarly Catalogues". Ed. by J. Trant and D. Bearman. *Museums and the Web 2011: Proceedings*. Toronto: Archives & Museum Informatics, visited on 05/30/2019, http://conference.archimuse.com/mw2011/papers/transition_to_online_scholarly_catalogues.
- Hooper-Greenhill, Eilean. 2007. "Interpretive Communities, Strategies and Repertoires". In *Museums and their Communities*, ed. by Sheila Watson. London, New York: Routledge.
- Hourston Hanks, Laura. 2012. "Writing spatial stories: textual narratives in the museum". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- Hughes, Sally. 2010. *Museum Publishing: Production and Reception of Museum Books*. Ph.D. Thesis, University of Leicester.

- Huhn, Peter. 2011. "Event and Eventfulness". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. https://wikis.sub.uni-hamburg.de/lhn/index.php/Event_and_Eventfulness.
- Huhtamo, Erkki. 2009. "The Origins of the Virtual Museum". In *Museums in a Digital Age*, ed. by Ross Parry. London and New York: Routledge.
- Iser, Wolfgang. 1978. *The art of reading: A theory of aesthetic response*. Baltimore: Johns Hopkins University Press.
- Jahn, Manfred. 2007. "Focalization". In *The Cambridge companion to narrative*, ed. by David Herman. Cambridge: Cambridge University Press.
- Jannidis, Fotis. 2005. "Author". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- Kalfatovic, Martin R. 2002. *Creating a Winning Online Exhibition: A Guide for Libraries, Archives, and Museums*. Chicago: American Library Association.
- Karlsson, Josefine, et al. 2018. "Profiles of young readers: Evidence from thinking aloud while reading T narrative and expository texts". *Learning and Individual Differences* 67:105–116. doi:10.1016/j.lindif.2018.08.001.
- Kidd, Jenny. 2014. *Museums in the new mediascape: transmedia, participation, ethics*. London: Routledge.
- Kim, Soyeon. 2018. "Virtual exhibitions and communication factors". *Museum Management and Curatorship* 33 (3): 243–260. doi:10.1080/09647775.2018.1466190.
- Knutson, Karen. 2013. "Exploring art and history at the Warhol Museum using a Timeweb". In *The connected museum: Social media and museum communication*, ed. by Kirsten Drotner and Kim Christian Schrøder. London: Routledge.
- Koci Hernandez, Richard, and Jeremy Rue. 2015. *The Principles of Multimedia Journalism: Packaging Digital News*. London and New York: Routledge.
- Koskimaa, Raine. 2010. "Approaches to Digital Literature: Temporal Dynamics and Cyborg Authors". In *Reading Moving Letters: Digital Literature in Research and Teaching*, ed. by Roberto Simanowski; Jörgen Schäfer and Peter Gendolla. Transcript Verlag.
- Kossak, Florian. 2012. "Productive Exhibitions: looking backwards to go forwards". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- Kraall, Astrid, et al. 2017. "Processing of expository and narrative texts by low and high-comprehending children". *Reading and Writing* 31 (9): 1–24. doi:10.1007/s11145-017-9789-2.

- Kraemer, Harald. 2007. "Simplicity, Slowness and Good Old Stories as Strategies and Perspectives of Design in Hypermedia and Media". *International Cultural Heritage Informatics Meeting (ICHIM07): Proceedings*. Visited on 05/30/2019. <http://www.archimuse.com/ichim07/papers/kraemer/kraemer.html>.
- Krauss, Rosalind. 1996. "Postmodernism's museum without walls". In *Thinking about exhibitions*, ed. by Bruce W. Ferguson Reesa Greenberg and Sandy Nairne, 241–245. London and New York: Routledge.
- Kristeller, Paul Oskar. 1951. "The Modern System of the Arts: A Study in the History of Aesthetics Part I". *Journal of the History of Ideas* 12 (4): 496–527.
- Kukkonen, Karin. 2014. "Plot". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. <http://www.lhn.uni-%20hamburg.de/article/plot>.
- Lai, Teresa, and Christopher Noey. 2013. "Embodying the Museum: The Metropolitan Museum of Art's Connections and 82nd & Fifth". Ed. by N. Proctor and R. Cherry. *Museums and the Web Conference Asia 2013*. Silver Spring, MD: Museums and the Web, visited on 05/30/2019, <http://mwa2013.museumsandtheweb.com/paper/embodying-the-museum-the-metropolitan-museum-of-arts-connections-and-82nd-fifth/>.
- Landow, George P. 2006. *Hypertext 3.0: Critical Theory and New Media in an Era of Globalization*. Baltimore, MD: Johns Hopkins University Press.
- . 1992. *Hypertext: The Convergence of Contemporary Critical Theory and Technology*. Baltimore, MD: Johns Hopkins University Press.
- . 1997. "Twenty minutes into the future, or how are we moving beyond the book?" In *The Future of the Book*, ed. by Geoffrey Nunberg, 209–237. Berkeley: University of California Press.
- Late Hokusai Project*. 2017. British Museum. Visited on 05/30/2019. <https://www.latehokusai.org/>.
- Lee, Ahree, and Susan Edwards. 2015. "Prototyping a Digital Publication for Scholars". *The Getty Iris*. Visited on 05/30/2019. <http://blogs.getty.edu/iris/prototyping-a-digital-publication-for-scholars/>.
- Leinhardt, Gaea, Carol Tittle, and Karen Knutson. 2002. "Talking to Oneself: Diaries of Museum Visits". In *Learning conversations in museums*, ed. by K. Crowley & K. Knutson G. Leinhardt. New Jersey: Lawrence Erlbaum Associates. Visited on 05/30/2019. <http://mlc.lrdc.pitt.edu/mlc>.
- Lessing, Gotthold E. 1984 (1836). *Laocoon. Or The Limits Of Poetry And Painting*. Baltimore: The Johns Hopkins University Press.

- Lester, Peter. 2006. "Is the virtual exhibition the natural successor to the physical?" *Journal of the Society of Archivists* 27 (1): 85–101. doi:10.1080/00039810600691304.
- Leuner, Kirstyn. 2014. "Book to E-text". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Lewis-Beck, Michael S., Alan Bryman, and Tim Futing Liao, eds. 2004. "Snowball sampling". In *The SAGE encyclopedia of social science research methods*, 1043–1044. Thousand Oaks, CA: SAGE. doi:10.4135/9781412950589.
- Lialina, OIia. 1998. "CHEAP.ART". Visited on 05/30/2019.
http://subs01.c3.hu/subs01_2/contributors3/lialinatext.html.
- Lidchi, Henrieta. 1997. "The Poetics and the Politics of Exhibiting Other Cultures". In *Representation: Cultural Representations and Signifying Practices*, ed. by Stuart Hall. London: Sage.
- Liew, Chern Li. 2005. "Online cultural heritage exhibitions: a survey of information retrieval features". *Program* 39 (1): 4–24. doi:10.1108/00330330510578778.
- . 2006. "Online cultural heritage exhibitions: a survey of strategic issues". *Program* 40 (4): 372–388. doi:10.1108/00330330610707944.
- Lord, Barry, and Maria Piacente. 2014. *Manual of Museum Exhibitions*. Lanham, MD: Rowman & Littlefield.
- Lyotard, Jean-François. 1996. "Les Immateriaux". In *Thinking about exhibitions*, ed. by Bruce W. Ferguson Reesa Greenberg and Sandy Nairne, 114–125. London and New York: Routledge.
- Macdonald, Sharon. 1995. "Introduction". *The Sociological Review* 43 (1): 1–18.
doi:j.1467-954X.1995.tb03422.x.
- MacDonald, Sharon, and Silverstone Roger. 1990. "Rewriting the museums' fictions: Taxonomies, stories and readers". *Cultural Studies* 4 (2): 176–191.
doi:10.1080/09502389000490141.
- MacLeod, Suzanne, Laura Hanks Hourston, and Jonathan Hale, eds. 2012. *Museum Making: narratives, architectures, exhibitions*. London; New York: Routledge.
- Malloy, Judy. 2014. "Authoring Systems". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Malraux, André. 1954. *The voices of silence*. Trans. by Stuart Gilbert. London: Secker & Warburg.

- Mann, Laura. 2016. "Online scholarly catalogues: Data and insights from OSCI". Ed. by N. Proctor & R. Cherry. *Museums and the Web 2016*. Silver Spring, MD: Museums and the Web, visited on 05/30/2019, <http://mw2016.museumsandtheweb.com/paper/online-scholarly-catalogues-data-and-insights-from-osci/>.
- Manovich, Lev. 2015. "Data Science and Digital Art History". *International Journal for Digital Art History*, [S.l.] No. 1.
doi:<http://dx.doi.org/10.11588/dah.2015.1.21631>.
- . 2000. "Database as a Genre of New Media". *AI & Society* 14 (2). Visited on 05/30/2019. http://time.arts.ucla.edu/AI_Society/manovich.html.
- . 2013. *Software takes command*. New York: Bloomsbury Academic.
- . 2002. *The language of New Media*. Cambridge, MA: MIT Press.
- Margolin, Uri. 2013. "Narrator". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. [hup.sub.uni-hamburg.de/lhn/index.php.?title=Narrator.&oldid=2046](http://sub.uni-hamburg.de/lhn/index.php.?title=Narrator.&oldid=2046).
- Marty, Paul F. 2007. "Museum Websites and Museum Visitors: Before and After the Museum Visit". *Museum Management and Curatorship* 22 (4): 337–360.
doi:10.1080/09647770701757708.
- . 2008. "Museum websites and museum visitors: digital museum resources and their use". *Museum Management and Curatorship* 23 (1): 81–99. doi:10.1080/09647770701865410.
- Mason, Rhiannon. 2006. "Cultural Theory and Museum Studies". In *A companion to museum studies*, ed. by Sharon Macdonald. Malden, MA; Oxford: Blackwell.
- . 2005. "Museums, galleries and heritage: Sites of meaning-making and communication". In *Heritage, Museums and Galleries: An introductory reader*, ed. by Gerard Corsane. London, New York: Routledge.
- Mateos-Rusillo, Santos M., and Arnau Gifreu-Castells. 2017. "Museums and online exhibitions: a model for analysing and charting existing types". *Museum Management And Curatorship* 32 (1): 40–49.
doi:<http://dx.doi.org/10.1080/09647775.2015.1118644>.
- McMaster, Kristen L, et al. 2012. "Making the right connections: Differential effects of reading intervention for subgroups of comprehenders". *Learning and Individual Differences* 22:100–111. doi:10.1016/j.lindif.2011.11.017.
- McTavish, Lianne. 2006. "Visiting the virtual museum: Art and experience online". In *New museum theory and practice: an introduction*, ed. by Janet Marstine. Malden MA: Blackwell.

- Merkens, Hans. 2004. "Selection procedures, sampling, case construction". In *A companion to qualitative research*, ed. by Ernest von Kardorff Uwe Flick and Ines Steinke. London: SAGE.
- Mikics, David. 2007. *A New Handbook of Literary Terms*. New Haven, CT: Yale University Press.
- Mitchell, W.J.T. 1986. *Iconology: Image, Text, Ideology*. Chicago: University of Chicago Press.
- "Mnemosyne. Meanderings through Aby Warburg's Atlas". 2013-15. Cornell University. Visited on 05/30/2019. <http://warburg.library.cornell.edu>.
- Monfort, Nick. 2007. "Narrative and digital media". In *The Cambridge companion to narrative*, ed. by David Herman. Cambridge: Cambridge University Press.
- Mora, Vicente Luis. 2012. *El Lector-espectador: Deslizamientos entre literatura e imagen*. Barcelona: Seix Barral.
- Moraru, Christian. 2005. "Intertextuality". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- Moretti, Franco. 2005. *Graphs, Maps, Trees: Abstract Models for a Literary History*. London: Verso.
- Morris, Adelaide. 2014. "Reading Strategies". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Müller, Klaus. 2009. "Museums and virtuality". In *Museums in a Digital Age*, ed. by Ross Parry. London and New York: Routledge.
- Mundy, Jennifer, and Jane Burton. 2013. "Online Exhibitions". Ed. by N. Proctor and R. Cherry. *Museums and the Web 2013*. Silver Spring, MD: Museums and the Web, visited on 05/30/2019, <http://mw2013.museumsandtheweb.com/paper/online-exhibitions/>.
- Munslow, Alun. 2007. *Narrative and history*. London: Palgrave Macmillan.
- Murphy, Oonagh. 2018. "Museum Studies as Critical Praxis: Developing an Active Approach to Teaching, Research and Practice". *Tate Papers* 29. Visited on 05/30/2019. <https://www.tate.org.uk/research/publications/tate-papers/29/museum-studies-critical-praxis>.
- Nickerson, Matthew. 2002. "Voices: Bringing Multimedia Museum Exhibits to the World Wide Web". *First Monday* 7 (75). Visited on 05/30/2019. http://firstmonday.org/issues/issue7_5/nickerson/index.html.

- Nielsen, Jakob. 2000. *Designing web usability: The practice of simplicity*. New Riders Publishing.
- . 2012. "How Many Test Users in a Usability Study?" *Nielsen Normal Group. Articles*. Visited on 05/30/2019.
<https://www.nngroup.com/articles/how-many-test-users/>.
- . 1993. *Usability engineering*. Boston, MA; London: Academic Press.
- Oates, George, et al. 2015. *Two Way Street*. Visited on 05/30/2019. <http://twoway.st>.
- Object: Photo*. 2014. Museum of Modern Art. Visited on 10/13/2017.
<https://www.moma.org/interactives/objectphoto/>.
- O'Neill, Patrick. 2005. "Narrative Structure". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- Online Editions*. 2014. National Gallery of Art. Visited on 10/13/2017.
<https://www.nga.gov/research/online-editions.html>.
- Osborne-Bender, Sarah. August 2015. "Object:Photo". *ARLIS/na Multimedia and technology reviews*. Visited on 05/30/2019.
<https://www.arlisna.org/publications/multimedia-technology-reviews/662-object-photo>.
- Palombini, Augusto. 2016. "Storytelling and telling history. Towards a grammar of narratives for Cultural Heritage dissemination in the Digital Era". *Journal of Cultural Heritage* 24:134139. doi:10.1016/j.culher.2016.10.017.
- Parry, Ross. 2007. *Recoding the museum: digital heritage and the technologies of change*. London: Routledge.
- Pau, Stephanie. 2017. "Audio that moves you: experiments with location-aware storytelling in the SFMOMA app". *MW2017: Museums and the Web 2017*. Visited on 05/30/2019.
<https://mw17.mwconf.org/paper/audio-that-moves-you-experiments-with-location-aware-storytelling-in-the-sfmoma-app/>.
- Paul, Christiane. 2014. "Interface". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Peacock, Darren, and Jonny Brownbill. 2007. "Audiences, Visitors, Users: Reconceptualising Users Of Museum On-line Content and Services". Ed. by J. Trant and D. Bearman. *Museums and the Web 2007: Proceedings*. Toronto: Archives & Museum Informatics, visited on 05/30/2019,
<http://www.archimuse.com/mw2007/papers/peacock/peacock.html>.

- Pekarik, Andrew J., and James B. Schreiber. 2012. "The Power of Expectation". *Curator: The Museum Journal* 55 (4): 487–496. doi:10.1111/j.2151-6952.2012.00171.x.
- Persons, Seth. 2018. "MoMA.org Turns 20: Archiving Two Decades of Exhibition Sites". In *Inside/Out A MoMA/MoMA PSI Blog*. Visited on 05/30/2019. https://www.moma.org/explore/inside_out/2015/05/25/moma-org-turns-20-archiving-two-decades-of-exhibition-sites/?utm_source=social&utm_medium=twitter&utm_campaign=052515b.
- Phelan, James, and Peter J. Rabinowitz, eds. 2005. *A companion to Narrative Theory*. Malden, MA; Oxford: Blackwell.
- Piehl, Jona, and Suzanne MacLeod. 2012. "Where do you want the label? The roles and possibilities of exhibition graphics". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- Polkinghorne, Donald E. 1995. "Narrative configuration in qualitative analysis". *International Journal of Qualitative Studies in Education* 8 (1): 5–23. doi:10.1080/0951839950080103.
- Pope, James. 2010. "Where Do We Go From Here? Readers' Responses to Interactive Fiction. Narrative Structures, Reading Pleasure and the Impact of Interface Design". *Convergence: The International Journal of Research into New Media Technologies* 16 (1): 75–94. doi:10.1177/1354856509348774.
- Porter, Gaby. 1995. "Seeing through Solidity: a feminist perspective on museums". *The Sociological Review* 43 (1): 105–126. doi:j.1467-954X.1995.tb03427.x.
- Preziosi, Donald. 2006. "Art History and Museology: Rendering the Visible Legible". In *A companion to museum studies*, ed. by Sharon Macdonald. Malden, MA; Oxford: Blackwell.
- Prince, Gerald. 2003 (1987). *A dictionary of narratology*. Lincoln, NE: University of Nebraska Press.
- . 2005. "Narrativity". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- . 1982. *Narratology. The Form and Functioning of Narrative*. Berlin, New York, Amsterdam: Mouton Publishers.
- . 2013. "Reader". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. <http://sub.uni-hamburg.de/lhn/index.php.?title=Reader.&oldid=1465>.
- Propp, Vladimir. 1968. *Morphology of the Folktale*. Austin: University of Texas Press.

- Quigley, Samuel D., and Elizabeth Neely. 2011. "Integration of Print and Digital Publishing Workflows at the Art Institute of Chicago". Ed. by J. Trant and D. Bearman. *Museums and the Web 2011: Proceedings*. Toronto: Archives & Museum Informatics, visited on 05/30/2019, http://www.museumsandtheweb.com/mw2011/papers/integration_of_print_and_digital_publishing_wo.html.
- Quigley, Samuel D., Elizabeth Neely, et al. 2013. "Scholarship and Digital Publications: Where Research Meets Innovative Technology". *Visual Resources* 29 (1-2). doi:10.1080/01973762.2013.761122.
- Rapp, David N., et al. 2007. "Higher-Order Comprehension Processes in Struggling Readers: A Perspective for Research and Intervention". *Scientific studies of reading* 11 (4): 289–312. doi:10.1080/10888430701530417.
- RCMG. 2001a. *Visitors Interpretive Strategies at Nottingham Castle Museum and Art Gallery*. Leicester: Department of Museum Studies University of Leicester. <https://www2.le.ac.uk/departments/museumstudies/rcmg/projects/making-meaning-in-art-museums-2-1/Making%5C%20Meaning%5C%202.pdf>.
- . 2001b. *Visitors Interpretive Strategies at Wolverhampton Art Gallery*. Leicester: Department of Museum Studies University of Leicester. <https://www2.le.ac.uk/departments/museumstudies/rcmg/projects/making-meaning-in-art-museums-1/Making%5C%20meaning%5C%201.pdf>.
- "reader, n." 2018. In *OED Online*. Oxford: Oxford University Press. Visited on 05/30/2019. <http://www.oed.com.ezproxy.lib.gla.ac.uk/view/Entry/158857?redirectedFrom=reader&>.
- Reeves, Stuart. 2014. "What Is the Relationship Between HCI Research and UX Practice?" *UX Matters*. Visited on 05/30/2019. <https://www.uxmatters.com/mt/archives/2014/08/what-is-the-relationship-between-hci-research-and-ux-practice.php>.
- Rettberg, Scott. 2014. "Collaborative Narrative". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Rhyne, Charles. 2013. "The Book Transformed". *Visual Resources* 29 (1-2): 107–119. doi:10.1080/01973762.2013.761128.
- Ricoeur, Paul. 1981. "Narrative Time". In *On Narrative*, ed. by W. J. T. Mitchell. The University of Chicago Press: Chicago.
- Riessman, Catherine K. 1993. *Narrative Analysis*. Thousand Oaks, CA: SAGE.

- . 2002. “Narrative analysis”. In *The qualitative researcher’s companion*, ed. by A. Michael Huberman and Matthew B. Miles, 216–270. Thousand Oaks, CA: SAGE. doi:10.4135/9781412986274.
- . 2004. “Narrative analysis”. In *The SAGE Encyclopedia of Social Science Research Methods*, ed. by Michael S. ; Alan Bryman Lewis-Beck and Tim Futing Liao. Thousand Oaks, CA: SAGE. doi:10.4135/9781412950589.
- . 2008. *Narrative Methods for the Human Sciences*. Thousand Oaks, CA: SAGE.
- Roddis, Tristan. 2018. “Making Metadata Into Meaning: Digital Storytelling With IIIF”. Ed. by N. Proctor & R. Cherry. *MW18: MW 2018*. Visited on 05/30/2019. <https://mw18.mwconf.org/paper/making-metadata-into-meaning-digital-storytelling-with-iiif/>.
- Rodríguez-Ortega, Nuria. 2013. “It’s time to rethink and expand Art History for the digital age”. In *The Getty Iris*. Visited on 05/30/2019. <http://blogs.getty.edu/iris/its-time-to-rethink-and-expand-art-history-for-the-digital-age/>.
- Romano-Bergstrom, Jennifer. 2013. “Moderating Usability Tests”. *usability.gov*. Visited on 05/30/2019. <https://www.usability.gov/get-involved/blog/2013/04/moderating-usability-tests.html>.
- Romeo, Fiona. 5 of February, 2016. “What motivates a visit to MoMA’s website?” In *Digital @ MoMA, Medium*. Visited on 05/30/2019. <https://medium.com/digital-moma/what-motivates-a-visit-to-moma-s-website-ebad33e67ef0#.7q4mewz4k>.
- Roppola, Tiina. 2012. *Designing for the Museum Visitor Experience*. London, New York: Routledge.
- Roussou, Maria, et al. 2015. “The museum as digital storyteller: Collaborative participatory creation of interactive digital experiences”. *MW2015: Museums and the Web 2015*. Visited on 05/30/2019. <http://mw2015.museumsandtheweb.com/paper/the-museum-as-digital-storyteller-collaborative-participatory-creation-of-interactive-digital-experiences/>.
- Runnel, Pille, and Pille Pruulmann-Vengerfeldt, eds. 2014. *Democratising the Museum. Reflections on Participatory Technologies*. Frankfurt am Main, Berlin, Bern, Bruxelles, New York, Oxford, Wien: PI Academic Research.
- Ryan, Marie-Laure. 2006. *Avatars of Story*. Minneapolis, MN: University of Minnesota Press.
- . 2007a. “Diagramming narratives”. *Semiotica* 165 (1-4): 11–40.
- . 2014a. “Graph theory”. In *The Johns Hopkins Guide to Digital Media*, ed. by Marie-Laure Ryan, Lori Emerson, and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.

- . 2004. "Multivariant Narratives". In *A Companion to Digital Humanities*, ed. by Ray Siemens Susan Schreibman and John Unsworth. Oxford: Blackwell. Visited on 05/30/2019. <http://www.digitalhumanities.org/companion/view?docId=blackwell/9781405103213/9781405103213.xml&chunk.id=ss1-4-9&toc.depth=1&toc.id=ss1-4-9&brand=default>.
- . 2012. "Narration in Various Media". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. https://wikis.sub.uni-hamburg.de/lhn/index.php/Narration_in_Various_Media.
- , ed. 1991. *Possible Worlds, Artificial Intelligence, and Narrative Theory*. Bloomington: Indiana University Press.
- . 2014b. "Space". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. <http://www.lhn.uni-hamburg.de/article/space>.
- . 2011. "The Interactive Onion: Layers of User Participation in Digital Narrative Texts". In *New Narratives: Stories and Storytelling in the Digital Age*, ed. by Ruth Page and Bronwen Thomas. Lincoln NE: University of Nebraska Press.
- . 2007b. "Toward a definition of narrative". In *The Cambridge companion to narrative*, ed. by David Herman. Cambridge: Cambridge University Press.
- Ryan, Marie-Laure, James Ruppert, and John W. Bernet, eds. 2004. *Narrative Across Media: The Languages of Storytelling*. Lincoln, NE: University of Nebraska Press.
- Saldaña, Jonny. 2013. *The coding manual for qualitative researchers*. Thousand Oaks, CA: SAGE.
- Samis, Peter, and Tim Svenonius. 2015. "The X, Y, and Z of digital storytelling: Dramaturgy, directionality, and design". *MW2015: Museums and the Web 2015*. Visited on 05/30/2019. <http://mw2015.museumsandtheweb.com/paper/the-x-y-z-of-digital-storytelling-dramaturgy-directionality-and-design/>.
- Sanz, Amelia, and María Goicoechea. 2012. "Literary reading rituals and practices on new interfaces". *Literacy and linguistic computing* 27 (3): 331–346. doi:<https://doi.org/10.1093/l1c/fqs037>.
- Sayre, Scott. 2000. "Sharing the experience: The building of a successful online/on-site exhibition". Ed. by J. Trant and D. Bearman. *Museums and the Web 2000*. Pittsburgh, PA : Archives & Museum Informatics, visited on 05/30/2019, <http://www.archimuse.com/mw2000/papers/sayre/sayre.html>.
- Schneider, Ralf. 2005. "Hypertext narrative and the reader: a view from cognitive theory". *European Journal of English Studies* 9 (2): 197–208. doi:10.1080/13825570500172067.

- Schön, Donald A. 1983. *The reflective practitioner. How professionals think in action*. New York: Basic Books.
- Schonert, Jorg. 2014. "Author". In *The living handbook of narratology*, ed. by Peter Hühn et al. Hamburg: Hamburg University Press. Visited on 05/30/2019. <http://www.lhn.uni-hamburg.de/article/author>.
- Schorch, Philipp. 2014. "Cultural feelings and the making of meaning". *International Journal of Heritage Studies* 20 (1): 2235. doi:10.1080/13527258.2012.709194.
- . 2013. "The experience of a museum space". *Museum Management and Curatorship* 28 (2): 193–208. doi:10.1080/09647775.2013.776797.
- Scrollytelling*. 2016. Museo Nacional del Prado. Visited on 10/13/2017. <https://www.museodel%20prado.es/en/whats-on/exhibition/bosch-the-5th-century-exhibition/f049c260-888a-4ff1-8911-b320f587324a>.
- Seipel, Ben, Sarah E. Carlson, and Virginia E. Clinton. 2017. "When Do Comprehender Groups Differ? A Moment-by-Moment Analysis of Think-Aloud Protocols of Good and Poor Comprehenders". *Reading Psychology* 38 (1): 1–32. doi:10.1080/02702711.2016.1216489.
- Serrell, Beverly, ed. 2015. *Exhibit Labels: An Interpretive Approach, Second Edition*. Lanham, MD: Rowman Littlefield.
- Seydel, Jorinde. 1999. "The exhibition as emulator". *Mediamatic* 10 (1). Visited on 05/30/2019. <https://www.mediamatic.net/en/page/10326/the-exhibition-as-emulator>.
- Shen, Dan. 2005. "Story-discourse distinction". In *Routledge Encyclopedia of Narrative Theory*, ed. by David Herman; Manfred Jahn; and Marie-Laure Ryan. London, New York: Routledge.
- Silverman, Lois H. 1995. "Visitor Meaning-Making in Museums for a New Age". *Curator The Museum Journal* 38 (3): 161–170. doi:10.1111/j.2151-6952.1995.tb01052.x.
- Simanowski, Roberto. 2014. "Digital and net art". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Skolnick, Lee H. 2012. "Beyond narrative: designing epiphanies". In *Museum Making: narratives, architectures, exhibitions*, ed. by Suzanne MacLeod, Laura Hourston Hanks, and Jonathan Hale. London; New York: Routledge.
- . 2005. "Towards a new museum architecture. narrative and representation". In *Reshaping Museum Space: Architecture, Design, Exhibitions*, ed. by Suzanne MacLeod. London, New York: Routledge.

- Smith-Bautista, Susana. 2013. *Museums in the Digital Age : Changing Meanings of Place, Community, and Culture*. Lanham, MD: AltaMira Press.
- Sosnoski, James J. 1999. "HyperReaders and Their Reading Engines". In *Passions, Politics, and 21st Century Technologies*, ed. by Gail E. Hawisher and Cynthia L. Selfe, 161-177. Logan, Utah and Urbana, IL: Utah State University Press-NCTE.
- Springer, Julie, Sara Kajder, and Julia Borst Brazas. 2004. "Digital Storytelling at the National Gallery of Art". Ed. by J. Trant and D. Bearman. *Museums and the Web 2004*. Arlington, VA, USA: Archives & Museum Informatics, visited on 05/30/2019, <http://www.museumsandtheweb.com/mw2004/papers/springer/springer.html>.
- Srinivasan, Ramesh, et al. 2010. "Diverse Knowledges and Contact Zones within the Digital Museum". *Science, Technology, & Human Values* 35 (5): 735–768. doi:10.1177/0162243909357755.
- Staniszewski, M. A. 1998. *The Power of Display: A History of Exhibition Installations at the Museum of Modern Art*. Cambridge, MA: MIT Press.
- Sternberg, Meir. 1978. *Expositional Modes and Temporal Ordering in Fiction*. Bloomington: Indiana University Press.
- Strehovec, Janez. 2014. "E-Literary Text and New Media Paratexts". In *Examining Paratextual Theory and Its Applications in Digital Culture*, ed. by Nadine Desrochers and Daniel Apollon. Pennsylvania: IGI Global.
- Teather, J. Lynne. 1991. "Museum studies: Reflecting on reflective practice". *Museum Management and Curatorship* 10 (4): 403–417. doi:10.1080/09647779109515291.
- "text, n." 2018. In *OED Online*. Oxford: Oxford University Press. Visited on 05/30/2019. <http://www.oed.com.ezproxy.lib.gla.ac.uk/view/Entry/200002?result=1&rskey=GifMK4&>.
- The Legacy of Ancient Palmyra*. 2017. Los Angeles, CA: J. Paul Getty Trust. Visited on 05/30/2019. www.getty.edu/palmyra.
- The Networked Curator*. 2018. Visited on 05/30/2019. <http://networkedcurator.doingdh.org/>.
- Therrien, Carl. 2014. "Interface". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Thomas, Wendy, and Danielle Boily. 1998. "Virtual Exhibition Production: A Reference Guide". *Museums and the Web 1998*. Visited on 05/30/2019. https://www.museumsandtheweb.com/mw98/papers/boily/boily_paper.html.

- Thon, Jan-Noel. 2014. "Mediality". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.
- Tinkler, Marc, and Michael Freedman. 1998. "Online Exhibitions: A Philosophy of Design and Technological Implementation". *Museums and the Web 1998*. Visited on 05/30/2019. http://www.museumsandtheweb.com/mw98/papers/tinkler/tinkler_paper.html.
- du-Toit, Herman, and Brigham Dye. 2008. "Empathic Dramatic Engagement as a Metaphor for Learning in the Art Museum". *Visitor Studies* 11 (1): 73–89. doi:10.1080/10645570801938483.
- Treptow, Tanya, and Kathi Kaiser. 2015. "When to ask and when to shut up: How to get visitor feedback on digital interactives". *MW2015: Museums and the Web 2015*. Visited on 05/30/2019. <http://mw2015.museumsandtheweb.com/paper/when-to-ask-and-when-to-shut-up-how-to-get-visitor-feedback-on-digital-interactives/>.
- Valtolina, Stefano. 2016. "A Storytelling-Driven Framework for Cultural Heritage Dissemination". *Data Science and Engineering* 1 (2): 114–123. doi:10.1007/s41019-016-0007-z.
- Varisco, Robert A, and Ward M. Cates. 2005. "Survey of Web-based educational resources in selected U.S. art museums". *First Monday* 10 (7). Visited on 05/30/2019. <https://firstmonday.org/ojs/index.php/fm/article/view/1261/1181>.
- Verso. n. a. Minneapolis Institute of Art. Visited on 05/30/2019. <https://new.artsmia.org/art-artists/research/case-studies/verso-magazine/>.
- Villaespesa, Elena, and John Stack. 2015. "Finding the motivation behind a click: Definition and implementation of a website audience segmentation". *MW2015: Museums and the Web 2015*. Visited on 05/30/2019. <http://mw2015.museumsandtheweb.com/paper/finding-the-motivation-behind-a-click-definition-and-implementation-of-a-website-audience-segmentation/>.
- Walklate, Jenny. 2013. *Timescapes. The Production of Temporality in Literature and Museums*. Ph.D. Thesis, University of Leicester.
- Walsh, Peter. 1998. "The Web and the Unassailable Voice". *Archives and Museum Informatics* 11 (2): 77–85.
- Weibel, Peter. 2011. "Web 2.0 and the Museum". In *Imagery in the 21st Century*, ed. by Oliver Grau. Cambridge, MA: MIT Press.

- Whalen, Maureen. 2009. "What's Wrong With This Picture? An Examination of Art Historians' Attitudes About Electronic Publishing Opportunities and the Consequences of Their Continuing Love Affair with Print". *Art Documentation: Bulletin of the Art Libraries Society of North America* 28 (2): 13–22.
- White, Amber. 2016. "Using Digital Think-Alouds to Build Comprehension of Online Informational Texts". *The Reading Teacher* 69 (4): 421–425. doi:10.1002/trtr.1438.
- Wong, Amelia. 2015. "The whole story, and then some: digital storytelling' in evolving museum practice". *MW2015: Museums and the Web 2015*. Visited on 05/30/2019. <http://mw2015.museumsandtheweb.com/paper/the-whole-story-and-then-some-digital-storytelling-in-evolving-museum-practice/>.
- Woodruff, Anthony. 2018. "The museum can be visitor-centered: an intern's reflection". *Reflective Practice* 19 (2): 179–192. doi:10.1080/14623943.2018.1437402.
- Wyman, Bruce, et al. 2011. "Digital Storytelling in Museums: Observations and Best Practices". *Curator: The Museum Journal* 54 (4): 461–468. doi:10.1111/j.2151-6952.2011.00110.x.
- Yiu, Josh. 2013. "A New Norm for Studying Chinese Painting and Calligraphy Online". Ed. by N. Proctor & R. Cherry. *Museums and the Web 2013*. Silver Spring, MD: Museums and the Web, visited on 05/30/2019, <http://mwa2013.museumsandtheweb.com/paper/a-new-norm-for-studying-chinese-painting-and-calligraphy-online/>.
- Zorich, Diane M. 2012. *Transitioning to a Digital World. Art History, Its Research Centers, and Digital Scholarship*. New York and Fairfax, VA: The Samuel H. Kress Foundation / The Roy Rosenzweig Center for History / New Media, George Mason University.
- Zuern, John David. 2014. "Temporality of digital works". In *The Johns Hopkins Guide to Digital Media*, ed. by Lori Emerson Marie-Laure Ryan and Benjamin J. Robertson. Baltimore: Johns Hopkins University Press.