Changing books, changing roles

The role of the academic book publisher in the digital age

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MA Thesis

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30 December 2016

Words: 22363

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I. Introduction

'Even now, however, before more than the most preliminary digital forays are visible, it should be clear that a digital publishing system – either in form or in content; in the containers or the contained; in forms of scholarship or formats of scholarship – will not be simply the print system in digital dress. What is underway is not just a change in formats and publication processes, but a much more fundamental, ontological, change in what it means to be a participant in a digital as opposed to an analogue system, or, in particular, in a digital scholarly publishing system as opposed to the legacy print system.'
- Phil Pochoda[1]

Modern technologies improve at a rapid speed and change our society profoundly. Digital inventions have a significant impact on the field of academic book publishing. There are many types and formats of academic books, such as monographs, edited volumes and reference works. The main focus of my thesis is the monograph, because it is often considered the most important output of humanities research. I will analyse how the monograph changes in our digital society. Moreover, I will explore how this transition from print to digital has an impact on academic publishers. In order to fully understand the impact of digital possibilities on the shape of the book and the academic publishing industry, I will discuss other types of academic books as well.

As Pochoda describes, the print publishing system is fundamentally changing with the digital revolution. In this thesis, the transition from print to digital will be examined from the viewpoint of the academic publisher. In which way is the role of the academic book publisher changing in the digital age? Traditionally, academic publishers are mediators between authors and readers, but nowadays researchers are able to publish the results of their research online. Consequently, the role of publishers as gatekeepers is becoming unstable, but is there a new role for them in a digital society and what is this role? First, I will describe the digital revolution in more detail in order to better understand the starting point of my thesis.

1.1: Background: The digital revolution

The Internet plays a key factor in the digital revolution. In 2007, O'Reilly attempts to define the earlier coined term 'Web 2.0'. He describes it as the web as platform and mentions two important features of the Web 2.0. Firstly, he mentions the rise of blogging and the corresponding wisdom of

[1] P. Pochoda, 'The big one: The epistemic system break in scholarly monograph publishing', *New media & society*, 15 (2013), p. 370.

the crowd that is caused by the visibility and power of some bloggers who benefit from the self-referential blogging community and the search engines who use link structure to predict useful pages.[2] Secondly, he mentions the role of database management and the race of companies to own certain classes of data, such as the location and identity of users is an important aspect of the Internet.[3] The world is changing so fast that we are already talking about the Web 3.0 today. Berners-Lee, the inventor of the World Wide Web, describes the semantic web as a significant component of the Web 3.0. In a Ted talk from 2009, he explains that linked data becomes increasingly important.[4] The Web can now, with the use of eXtensible Markup Language (XML) and Resource Description Framework (RDF) connect data in a meaningful way across application and community boundaries.

In this landscape of technological innovations books, readership and authorship are bound to change as well. Printed monographs as we know it today are the result of historically developed conventions. The shape of the monograph as a historically developed status quo is deeply intertwined with scholarship. For example, the invention of the page in the third century allowed readers for the first time to grasp a large bulk of a text in a single glance, while the invention of page numbering in the sixth century enabled readers to refer to specific places in the text.[5] These inventions slowly developed with the Gutenberg revolution in the fifteenth and sixteenth century to a form similar to the printed book that we are now used to.[6] The monograph heavily depends on these historical conventions. In the print age page-numbering is the basis of scholarly references, the index at the back of the book and the table of contents. These inventions determine the reader's usage of printed monographs as well as other types of academic books and the usage of the book in academic communities. Academic publishers are the mediator between authors and readers and in this way the gatekeepers deciding which texts will find their way to publication and which do not. Printed academic books are material object which is distributed by publishers through various stakeholders, such as libraries.

A transition from these conventions to a new and unknown paradigm in book publishing is slowly visible. The first electronically published books – such as PDF and EPUB editions – resembled their printed counterparts as closely as possible.[7] The resemblance to the status quo of the print heritage is, however, slowly fading and we are now moving towards new digital native forms of

[2] T. O'Reilly, 'What is Web 2.0: Design patterns and business models for the next generation of software', *Communications and strategies*, 65 (2007), p. 26.
[3] Ibid, p. 29.
[4] T. Berners-Lee, 'The next web', *Ted2009*, February 2009 <https://www.ted.com/talks/tim_berners_lee_on_the_next_web/> (7 April 2016).
[5] O. Soffer and E. Eshet-Alkalai, 'Back to the future: An historical perspective on the pendulum-like changes in literacy', *Minds and machines*, 19 (2009), p. 52.
[6] M. Clarke, 'The digital revolution', in . R. Campbell, E. Pentz and I. Borthwick (eds.), *Academic and professional publishing* (Cambridge: Chandos Publishing, 2012), p. 79.
[7] Ibid, p. 80.

publishing, such as e-books that are based on linked data and the enrichment of content for specific use cases.[8] These new digital formats develop within a specific context of printed academic books. Consequently, the digital possibilities do not only change the definition of the academic book, but are shaped by the historically developed status quo of the print era as well. This means that the social context in which books are written, published and read are just as important as technological inventions.

The production processes of the monograph and the specific role of academic book publishers in the life cycle of the monograph shape the digital developments as well. At the same time, the digital revolution has a profound impact on the life cycle of the book and the role of academic publishers. Print and digital elements mutually influence each other and this provokes the question *what* academic book publishers are exactly publishing, *in which format* they are publishing it (print, digital or both) and, most importantly, *why* they are publishing it. The shape, function and purpose of the academic book is historically developed in the print era and is destined to change if books are published in a digital format. Consequently, the definition of what a book entails is bound to transform as well. In this changing landscape, publishers are confronted with the question in which ways and at which speed they are going to adapt to a digital environment.

Moreover, the debate about the added value of the academic publisher becomes increasingly relevant. Why do scholars need academic publishers when they are able to publish the results of their research projects online? The role of publishers as mediator between author and reader in the publishing chain should be an important topic of debate. The role of the academic publisher in this time of transitioning depends on the following questions. How much room do publishers have to make decisions in a field that is driven by the demands of the market and technological inventions? Should publishers play a proactive role in changing the shape of the book or should they, more passively, offer their services to the author and the scholarly community at large? These questions will be addressed in my thesis.

1.2: Method

The approach of this thesis is theoretical and systematic. Many specific conventions, such as publishing formats, business models, differences between print and digital reading and copyright systems are changing in the digital age and all these topics deserve their own research project. This thesis attempts to describe the ontological framework in which these changes can be understood. If publishers understand their own changing role in the digital age, they will be better able to anticipate the many challenges that the transition from print to digital evokes. The theoretical framework that I

[8] Ibid, p. 94.

will develop is based on the connection between the changes in the shape of the monograph and the changing role of the academic publisher in society. Digital developments have an impact on and are shaped by the historically developed status quo of the monograph and this transition from print to digital leads to changing tasks for the publisher. Academic books are fundamentally and ontologically different in print format than digital format. In close alignment with this development, the role of the academic publisher is fundamentally and ontologically different in the digital publishing system.

Furthermore, my approach is systematic. The main concern of my research project is to find an answer to the question about the changing role of publishers in society and not, for example, to give a historical analysis of the changing features of the book or a complete overview of the field of academic book publishing. This means that I will use references to the history of the book, such as conventions from the print era, and relevant theories in publishing studies, such as field theory, to shed a light on my research question. In this way, my thesis will be a critical examination of the role of the academic publisher regarding the production of the monograph in our digital society.

1.3: Structure of the thesis

The thesis consists of two parts. The first part will be focused on the academic book in a digital environment. I will start with the methodological challenge about how we can investigate an unknown digital future, while we are still living in a hybrid reading culture that combines print and digital elements. This question is relevant for both publishers and scholars who work in the field of publishing studies. Moreover, I will argue that in a digital environment academic books are bound to change fundamentally. In order to do this, I will describe the impact of various digital developments on the different academic fields and types of scholarly books. This includes the exploration of the stretching boundaries and features of the academic book in a digital environment. In addition, I will explain the changes regarding design and navigation in a digital environment, which have a profound impact on scholarly readership and authorship.

The second part of the thesis examines the role of academic book publishers regarding these ontological changes in the shape and usage of the academic book. I will provide a brief overview of the field of academic book publishing in order to place the position of the publisher in the proper context. The changing workflows of the academic publisher as well as his relationship and collaboration with librarians and the scholarly community will be illuminated. Besides, the changing relationship between publishers and end-users will be explored by discussing the role of data tracking. When I have established these changes in the digital publishing landscape, I will focus on the functions of the academic publisher. How do they change in the digital age? Finally, I will argue that the digital age opens up new opportunities for the academic publisher to continue their cultural and intellectual role in society.

II. The academic book in a digital environment

'Books are part of a social system that includes authors, readers, publishers, booksellers, libraries, and so forth. Books produce and are reciprocally produced by the system as a whole. They are not, then, simply "dead things" carrying pre-formed information from authors to readers. They are crucial agents in the cycle of production, distribution, and consumption.'
- Paul Duguid[9]

Duguid considers books to be crucial agents in the social life cycle of the book from author to reader and not merely the end product of the system. In this chapter, the impact of the digital revolution on the academic book will be examined from this perspective. The academic book will be interpreted as a living system in which technology influences the future of the book, but the changing features and boundaries of the book shape the environment of authors, publishers and readers as well. Firstly, I will focus on methodological challenges how we should examine the transition from print to digital. This question is not only important for scholarly research in book studies, but will shed a light on how publishers can deal with an uncertain future as well. Secondly, what are the digital changes in an academic environment that we are talking about? In order to answer this question, I will explore how different reading hardware and software might have an impact on various types of academic books. Thirdly, I will discuss how the shape of the academic book is changing in a digital environment. The boundaries of the book as we know them from the print era are stretching, which will have an impact on the shape of the book in a digital environment. Lastly, I will place this changing shape of the book in a more practical context and look at how changes regarding design have an impact on the practice of readers and authors in an academic environment.

2.1: From print to digital

Printed books rely on conventions regarding design, such as the use of pages, and this has created a reading culture in which readers are used to the materiality and fixity of the book, flipping through the pages and, especially in academic environments, referring to page numbers in order to locate specific passages in the text. The rise of the Web 2.0 and the digital infrastructure did therefore not immediately translate into the abandonment of printed books and the conversion to digital reading. Clarke estimates that the online distribution of scholarly books has lagged behind journals by over a

[9] P. Duguid, 'Material mattters: Aspects of the past and futurology of the book', in G. Nunberg (ed.), *The future of the book* (California: University of California Press, 1996), pp. 63-102.

decade.[10] He mentions several reasons for this delay.[11] Firstly, the financial model of journals, namely the journal subscription models, translates more easily to site license models that are required in a digital environment, while books have historically been sold on a one-time purchase basis with no updating. Secondly, the production of books is more difficult to translate to a digital workflow, because books are more complex than journals in terms of different sections and chapters of the book that rely on conventions regarding structure and design. Thirdly, books are consumed in long-form which is for most people too long to consume on a laptop or desktop computer screen and, consequently, they require specific reading technology.

Furthermore, it should be added to Clarke's explanation that the transition to a digital environment is not merely a question of convenient technology, but requires a social change as well. Thompson describes this as the social context in which books and the usage of these books are embedded.[12] These include the practices of social institutions, such as universities and research centres, which are bound up with the book as a physical object with a corresponding design that requires a specific form of reading and navigation through the book. Publishing houses have specific practices of legal rights and pricing that are based on printed books and are not easily translated to electronic formats.[13] Readers might not directly see benefits in consuming monographs in a digital format and publishers do not have immediate reasons for changing their publishing practices, especially not if the pricing models of digital books are still undetermined. This creates a situation of inertia: it requires extra motivation to adapt to a digital environment, while it is not always clear why the changes should be made and whether they are really beneficial. However, the social context has to change in order to adapt to a digital environment. At the same time, as Duguid's citation at the beginning of this chapter suggests, books produce the publishing system. Books are active agents that create a social system of institutions, conventions and culture around them. Consequently, academic books and the social context in which they are embedded are mutually influenced by each other. Books should be considered living objects that have an impact on the system in which they are embedded instead of merely end-products of the collaboration between authors and publishers.

It is important to reflect on the role of academic book publishers during the transition from print to digital. Academic books as well as their social context might change significantly in the digital future. How can publishers prepare for an unknown future? We are in such a profound way conditioned by our familiarity with printed books that we project our habits and prejudices on digital media. This is why many digital books have a strong resemblance to printed books and why it is

[10] Clarke, 'The digital revolution', p. 81.
[11] Ibid, pp. 81-82.
[12] Thompson, *Books in the digital age: The transformation of academic and higher education publishing in Britain and the United States* (Cambridge: Polity Press, 2012), p. 326.
[13] Ibid, pp. 316-317.

impossible to predict a future that lies completely beyond our print heritage. A good solution for this methodological challenge is to realise that our prejudices are not a weakness that we should overcome, but our strength. In Gadamer's view, the fundamental prejudice of the Enlightenment is the prejudice against prejudice itself, which denies tradition its power.[14] The ideal of an objective spectator who can conduct research is a prejudice itself which does not acknowledge the actual situation of people, namely that we are always living in the horizon of our tradition. As historical beings, we cannot overcome our prejudices and we have a need for cultural continuity. In order to be able to understand anything at all, we have to become aware of our prejudices. According to Gadamer, becoming aware of our prejudices happens precisely when we are addressed by something that lies beyond our horizon.[15]

The familiarity that we feel with printed books and the experience of strangeness with digital books creates an interplay in which we are provoked by our own habits and prejudices regarding features of the book. It is only in the experience of this provocation that publishers become aware of reading habits and specific conventions of the publishing industry that is built on printed books. Therefore, it is not very useful to wildly speculate about a completely born-digital future that no longer resembles the print heritage at all. This is especially the case, because, as Van der Weel points out, it is unlikely that a digital interface will ever be finished in the same way as the fixed layout of printed books.[16] Fluidity remains a defining characteristic of the digital era. Although in the future a reading culture in which print editions would only play a supplementary role or disappear completely might be plausible, at the moment we are still in a time of transition and in our hybrid reading culture printed academic books still play an important role. Instead of attempting to predict the unknown future, publishers and researchers in the field of book studies should be encouraged to become aware of the ways in which our embeddedness in history and culture influences the perception of e-books. The awareness of the present includes adapting to our hybrid reading culture as well. It is good to keep in mind that the period of transition to a digital environment might only be temporarily, but it is still a situation that publishers have to deal with at the moment and they have to find value and use for the books that are published today and in the near future.

Our hybrid reading culture is not only characterised by reading printed and digital books next to each other, but also by many digital books in which both elements that closely resemble printed books and elements that are completely born digital are intertwined. This is because the adaption of printed books to a digital environment is done in several steps. Elliott has worked out a continuum from scholarly books produced in the print heritage as it exists today to digital-only publications that

[14] H-G. Gadamer, *Truth and method* (London: Continuum, 2004), p. 273.
[15] Gadamer, *Truth and method*, p. 298.
[16] A. van der Weel, *Changing our textual minds: Towards a digital order of knowledge* (Manchester and New York: Manchester University Press, 2011), p. 189.

cannot be reproduced in print form.[17] On the one side of the spectrum, we have print monographs that will probably not be abandoned completely any time soon, because they form an excellent medium for long-term scholarship and have done so for many centuries. Moreover, some types of books might not lend themselves easily to digital publication at all. For example, the differences in colour processing of images between printed and digital pages might be a problem for books that rely on high-quality and detailed illustrations, such as books about art and architecture. One step closer to the digital end of Elliott's spectrum, we find long-form scholarship published digitally with a strong resemblance to print heritage. These are the books that are distributed digitally – for example, because it is economically more sustainable for publishers – but are not extensively digitally enhanced, such as books in PDF formats. The next step is long-form scholarship published digitally that is substantially enhanced by the digital format. For example, this could be digital books that include moving images and sound or the use of hyperlinks to navigate through the text or refer to external datasets. On the most extreme end of Elliott's continuum between printed and digital books stands the digitally published long-form scholarship that is not suitable for print publication. This might be texts that are not intended to be read in a linear fashion or publications that require constant updating which can be provided by digital technology. The first steps in the continuum can be clearly called books – in the sense of the historically developed status quo that relies on fixity and, in the case of monographs, on a structure regarding table of contents, chapters and index – while at the last step it is not clear whether the texts can still be considered books. If digitally native publications cannot be called books without any doubt, I will call them 'texts'.

How should we view this continuum from our print heritage to a completely new digital environment? Is it an ultimate progress toward the embracement of new technology and the abandonment of the old – the death of the book as some people phrase it? Or will the future information technology free us from the limits of the past? Duguid offers a fruitful view on these futurological tropes about technology. According to him, the first interpretation of technology is called supersession and the second liberation.[18] Both are extreme viewpoints that rely on the disentanglement of form and content. Duguid explains that supersession is the view that each new technological invention vanquishes each predecessor, which depends on the idea that the past is separated from the future.[19] Liberation is in this context the assumption that new technology will free the information from the old techniques to which information was bound. This interpretation is

[17] M.A. Elliott, 'The future of the monograph in the digital era: A report to the Andrew W. Mellon Foundation', *Journal of electronic publishing,* 18 (2015), <http://dx.doi.org/10.3998/3336451.0018.407> (17 March 2016).
[18] Duguid, 'Material mattters'.
[19] Ibid.

based on the separation of information from technology.[20] Form and content are viewed as independent from each other: the content must be transported to the new technological container because the old one is declared dead or the content should be freed from the previous container that has imprisoned the information.

The solution to the challenging questions about the future of technology can be found in linking the form and the content of the book and interpreting the past as strength. Books are both the product and the producer of a social system that includes authors, publishers, readers and various institutions that are involved in the life cycle of the book. In this way interpreted, the book is not simply the container of the content, but an active agent that shapes the content and usage of the book. Both Gadamer's and Duguid's views have a strong emphasis on the revaluation of culture and history in common. As Duguid states, it is a paradoxical idea that we can free ourselves from technology by means of a new form of technology and we should consider the rootedness of the text in materiality and social processes significant.[21] Moreover, we should resist bold announcements of the death of the book and other sweeping dismissals in favour of specific analyses of important cultural and technological changes.[22] The information that books carry is strongly connected to its materiality, fixity and its place in the social and cultural cycle of the book, which can be different for various types of books and habits of reading them.

In short, the digital future of books is unknown, but we can learn much from our prejudices regarding books and our experience with reading which is based in our history and culture. The profound way in which books are embedded in social and cultural practices explains why books are slower to adapt to a digital environment. Our current hybrid reading culture offers publishers a challenge to navigate the printed as well as the digital paradigm of books successfully. Instead of wildly speculating about a completely born-digital future, they should use their knowledge and experience of the past, while at the same time acknowledging the unpredictability and fluidity of the digital medium and Elliott's continuum from print heritage to born-digital.

2.2: Digital reading technology in academia

The transition from print to digital is not one big step from printed books to born-digital texts that are no longer suitable for print publication at all. On the contrary, the technological changes take place during a period of time in which we combine both elements of the print heritage and the new digital inventions. By examining the impact of the digital revolution on academic books, we cannot make sweeping generalisations, because the complexity of the intertwinement of technological

[20] Ibid.
[21] Ibid.
[22] Ibid.

inventions and cultural changes requires more specific analyses about different types of academic books and types of hardware and software. As I have stated, the main focus of my thesis is the monograph, but in order to better understand the impact of the digital revolution on the academic publishing industry, I will discuss other types of academic books as well. In this section I will pay attention to the different types of scholarly books across the academic disciplines and the specific reading culture in an academic environment. The comparison with other types of academic books will also shed a light on the specific shape of the monograph.

What exactly is an academic book and what are the different types that we can recognise? Regazzi explains that the purpose of the scholarly book is '[…] to discuss original research, provide a review of literature, and advance the body of knowledge of a particular discipline'.[23] It is an important means of communication between scholars. Regazzi describes the following types of academic books: monographs, edited volumes or collections, textbooks, reference works, and technical handbooks.[24] An edited volume is a collected and cohesive work that might consists of original research, summaries of existing research or reviews of literature by a various amount of contributors.[25] Textbooks are often used in class and are not always peer-reviewed, reference works include dictionaries and encyclopaedias and are heavily edited and organised, and technical handbooks cover particular techniques, technologies or procedures and include, for example, clinical handbooks and laboratory guides.[26] Monographs are defined as a one-volume scholarly work that gives extensive treatment of a particular topic.[27] Thompson explains that the lines between different types are not always easily drawn. Monographs are not always clearly distinguishable from a trade or 'academic-trade' title and scholarly publishers are constantly crossing and blurring this boundary.[28]

The boundaries of the different types of books – and even the distinction between a book and other forms of scholarly communication, such as journal articles – will be further blurred with the transition to a digital infrastructure. Pochoda argues that the scholarly content and not the traditional print containers will dictate publication length and format in a digital publishing system in which the scholarly content is overwhelmingly born-digital, then digitally organised, digitally processed, digitally produced and, as last step, digitally disseminated.[29] I would like to add that the digital publishing system will have an impact on the scholarly content as well, because form and content are intertwined with each other. The traditional print containers of the journal article and

[23] J. J. Regazzi, *Scholarly communications: A history from content as king to content as kingmaker* (London: Rowman & Littlefield Publishers, 2015), pp. 54-55.
[24] Ibid, pp. 55-56.
[25] Ibid, p. 55.
[26] Ibid, p. 56.
[27] Ibid, p. 55.
[28] Thompson, *Books in the digital age*, p. 85.
[29] Pochoda, 'The big one', p 367.

monograph are determined by the economics and conventions of the publishing industry instead of the use-value for readers or authors.[30] If scholarly content is only published digitally, the length is no longer dependent on conventions around print formats.

This means that new forms of transmission of scholarly knowledge can develop. For example, it would be possible to publish content that is not lengthy enough to be a traditional monograph but too long for a traditional journal article. Moreover, when the user-value of the author or reader becomes a central issue, as Pochoda predicts, the form of the scholarly content can be more easily adapted to specific needs for users that individual books or authors require. Consequently, the different types of scholarly books that exist in the print heritage might take a completely different form in the digital era. Although it is not very fruitful to speculate about an unknown future without considering our history and culture, it is good to keep in mind that the specific types of books might not exactly translate into a digital version the way they are in printed format. If books are adapted more to the individual needs of the reader and author, the specific types of books might not be the most important factor that determines the form of publication. Instead, the content of the specific book and the way it is read and used play defining roles. Besides, new types of books may emerge, while others might be abandoned.

A special type of book that deserves more attention is the monograph. The digital revolution has a profound impact on academic books, but the shift from print to digital is not the only factor that changes the field of academic book publishing. The second important development is the monograph crisis. The sales of monographs published in hardback only are declining especially since the mid-1980s.[31] Especially university presses have felt the decline. Many have closed down or shifted their focus – at least partly – to commercial publishing.[32] Another existential problem that university presses face is that many of the books they publish and that are sold to university libraries are almost never read.[33] In 1999 Darnton already noted that the monograph looks like '[...] an endangered species'[34]. The monograph seems to struggle for existence. If the sales are declining and not many people are willing to read them, are they still worth publishing? Is there a chance that the digital revolution will be the final blow to the monograph?

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[30] Ibid.
[31] Thompson, *Books in the digital age*, pp. 93-94.
[32] C. Steele, 'Monograph publishing in the 21st century: The future more than ever should be an open book', *Journal of electronic publishing,* 11 (2008), < http://dx.doi.org/10.3998/3336451.0011.201> (3 April 2016).
[33] R. Anderson, 'University Presses: "Under fire" or just under the gun (like the rest of us)?', *Scholarly kitchen*, 19 May 2014, <http://scholarlykitchen.sspnet.org/2014/05/19/university-presses-under-fire-or-just-under-the-gun-like-the-rest-of-us/> (3 April 2016).
[34] R. Darnton, 'The new age of the book', *New York review of books,* 18 March 1999, < http://www.nybooks.com/articles/1999/03/18/the-new-age-of-the-book> (1 May 2016).

Aside from the endangerment that surrounds monographs, there are signs that the monograph is still valued as well. A recent AOPEN-UK survey about the role of the monograph for academics in the humanities and social sciences reveals that most researchers still find both reading and publishing of monographs very important.[35] The monograph is viewed as a vehicle for career enhancement – such as for promotion – in the arts and humanities and is also praised for the intellectual depth in offering scholars the opportunity to clarify their own position on various aspects of their specialism.[36] The monograph has therefore still value today and publishers and researchers should think about how the monograph fits in with our hybrid reading culture, because the monograph with its traditional value in the humanities will probably be kept alive in print format next to a digital edition.[37] An option that might reduce the costs of the monograph and makes the dissemination more effective is 'print on demand', whereby books are only printed when they are requested.[38] A similar business model is demand-driven acquisition, whereby university libraries only purchase a specific title when it is requested by a customer. These new models keep the monograph alive and might ensure printed editions in the digital future.

The printed monograph is still viewed as valuable in arts and humanities research. This shows a difference between the various academic research fields, such as the humanities and the sciences. The sciences tend to be quicker to adapt to a digital environment than the humanities. There are different cultural and social practices within the academic fields which are possibly the cause for the different speed at which scholarly publications from the sciences and the humanities translate into a digital edition. The research output of the sciences is more based on facts, hypotheses and empirical research, while research in the humanities is often based on textual interpretation and argumentation. Eve explains that the chain of verification of references to claims upon which the new work rests can be significantly enhanced in a digital environment.[39] The enhancement means that the reference is a hyperlink to the claim or data upon which the statement in the new work is based. This possibility of enhancement makes more sense in the sciences, argues Eve, because their scholarly output refers more often directly to a specific claim or table of data than humanities research. In the humanities, the references are based on a more totalised understanding of the argument that the new work is referring to.[40]

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[35] OAPEN-UK. 'OAPEN UK: researcher survey,' 2014. <http://oapen-uk.jiscebooks.org/files/2012/02/OAPEN-UK-researcher-survey-final.pdf> (1 May 2016), pp. 4-5.
[36] P. Williams, I. Stevenson, D. Nicholas, A. Watkinson and I. Rowlands, 'The role and future of the monograph in arts and humanities research', *Aslib proceedings*, 61 (2009), p. 74.
[37] Ibid, p. 80.
[38] Ibid.
[39] Eve, *Open access and the humanities: Contexts, controversies and the future* (Cambridge: Cambridge University Press, 2014), p. 29.
[40] Ibid.

However, this does not mean that long-form publications in the humanities, such as monographs, are not bound to change in a digital environment. The Andrew W. Mellon Foundation created a working set of the features of the monograph of the future – adapted to modern digital practices.[41] This sheds a light on the ways in which monographs might change in a digital environment. The set of features includes, for example, fully interactive and searchable online with primary sources and other work, portable across reader applications and maintained and preserved in its digital form. Moreover, several university presses and libraries are developing new reading interfaces and publishing models for the monograph of the future.[42] For example, the University of Minnesota Press, in collaboration with the City University of New York, is developing tools and workflows for monographs that depend on the interaction between author and reader. In addition, a current trend is the rise of the digital humanities. The digital humanities apply information technology to do research, such as performing statistical analysis on large amounts of data, which can vary from letter archives or the use of words in certain texts. These examples imply that a digital environment might be suitable for certain publications in the humanities as well.

I have established that 'the academic book' is a broad term that covers various types of books across multiple disciplines within academic communities. This suggests that there is not one answer to the question whether academic books are really suitable for a digital environment, but many answers depending on the specific purpose and possibilities of the type of the book. Although the monograph is endangered, there are still possibilities for the monograph to transition to – and perhaps even benefit from – a digital environment. In what remains of this section, I will explain the digital reading technologies and apply them in a more concrete manner to the different types of books and academic disciplines that I have discussed.

According to Clarke, the digital revolution for books has just begun, because we are just now emerging from a period during which digital publications resembled books from the print heritage as closely as possible toward the age of digital native products and services.[43] In this interpretation, we might be shifting more to the digital end of Elliott's continuum. We should, however, keep in mind that this development is different for various academic disciplines and types of books. The development of reading technology that is designed with long-term reading in mind, such as e-readers and tablets, is the driving force behind digital reading culture and, correspondingly, digital books. The e-reader became a popular reading device with the release of the Kindle by Amazon in 2007. For the first time, the market was ready for this specific reading device, which was likely caused by the advanced technology, such as the use of e-ink, and the direct connection to the e-book

[41] D. J. Waters, 'Monograph publishing in the digital age: A view from the Mellon Foundation', *Against the grain*, (2016), p. 17.
[42] Ibid, p. 20.
[43] Clarke, 'The digital revolution', p. 97.

store of Amazon itself that made the purchase of e-books user-friendly.[44] Tablets are also suitable for reading as well as other purposes, such as surfing the web and watching videos. It is more suitable for reading texts with images or complex layouts than e-readers or mobile phones, because its size resembles printed books. However, as Mod states, the tablet should not be blindly embraced as the duplicate of the printed book, because that would be a disservice to the new modes of interaction that tablets offer and it does not take into account the difference between the paper-based canvas and the screen-based canvas.[45]

Alongside the technological development of reading devices, reading formats are rapidly changing as well. The different reading devices require various electronic formats, of which the most often mentioned are HTML, PDF and EPUB.[46] HTML is used to display documents on the web and not often used for high-quality books. PDF is useful for screen reading as well but is also print-ready and suitable for storage in an archive, which is why PDF became the standard format in the publishing industry in the late 1990s.[47] PDF preserves the original layout of the document, such as text, images and graphics, and resembles the page-based structure of printed books. For example, the different pages in PDF can be images of the print pages. This fixity of PDF makes the format especially valuable for academic purposes, because scholars are able to refer to fixed page numbers. The drawback is that PDF is ill-suited for reflowing its content into smaller portable devices, such as mobile phones.[48] While the Kindle uses AZW as format, most other e-readers support EPUB as the preferred format. EPUB was released in 2007 with the aim to provide a standard that is free from legal restrictions on open use and is easy to implement in a range of devices.[49] The content adapts to the device on which it is opened instead of the other way around. In 2011, a new version – EPUB3 – was launched to provide richer layout capabilities and allow for multimedia books, which is especially useful for heavily illustrated books and books that include text as well as audio.[50]

Reading hardware is becoming increasingly suitable for long-term reading and reading software offers increasingly more possibilities to resemble (illustrated) printed books while at the same time providing unique digital possibilities and responsive design that can adapt to various devices. However, are these developments really useful for reading academic books? Various studies

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[44] L. Daly, 'Digital monograph technical landscape: Exemplars and recommendations', *The digital monograph technical landscape study #jiscPUB*, 15 December 2011, <http://jiscpub.blogs.edina.ac.uk/final-report> (26 March 2016)
[45] C. Mod, 'Designing books in the digital age', in H. McGuire and B. O'Leary (eds.), *Book: A futurist manifesto* (Sebastopol, CA.: O'Reilly Media, 2011), <http://book.pressbooks.com/chapter/book-design-in-the-digital-age-craig-mod> (29 May 2016).
[46] V. Böing, 'Editorial and production workflows', in . R. Campbell, E. Pentz and I. Borthwick (eds.), *Academic and professional publishing* (Cambridge: Chandos Publishing, 2012), p. 197.
[47] Thompson, *Books in the digital age*, p. 415.
[48] Daly, 'Digital monograph technical landscape'.
[49] Ibid.
[50] Ibid.

show that e-readers are especially suitable for reading fiction, but lack functionality in academic reading which requires easy browsing, navigating, searching, annotating, underlining and zooming.[51] Consequently, many students prefer to read e-books on their laptops or tablet computers despite the availability of more eye-friendly e-readers.[52] Readers are used to printed books and have developed specific reading habits that are not easily translated digitally. While the e-reader is better for long-term reading, this device has not yet many options for easily browsing and navigating which are often crucial aspects for academic reading. Most readers prefer to have a digital and a printed version of the scholarly book side by side to take advantage of the digital and print features of the book.[53] Printed books allow for browsing, navigating and annotating in ways that readers are used to in the print era, while digital books offer the possibility for enhancements and search functions.

There are, however, reasons to believe that certain types of academic books might benefit immensely from the transition from print to digital as well. Thompson mentions that academic works that require constant updating, such as books about financial data and legal information, benefit from online dissemination.[54] The fluidity of digital texts allow for updating. Moreover, Daly mentions in his report on the technical landscape for scholarly books three advantages for specific uses within the academic environment.[55] Firstly, the extensions of the core EPUB vocabulary in EPUB3 allow for publication of dictionaries that require rich references. Secondly, although EPUB3 still lacks specifications for indexing, possibilities are slowly opening up for indexes that include pop-ups for definitions in the text itself, cross-publication indexes and indexes that can be explored either in forward or reverse order. This means that index terms can be found in the content or the content can be found with use of the index terms. Thirdly, the initiative to easily develop various versions of the same work – print, fixed and reflowable text – might be of interest to the scholarly publishing industry as well, because it allows for flexibility and sustains the hybrid reading culture. EPUB3 is available in responsive design as well as fixed layout, which offers the possibility of a more complex layout. I would like to add that the drawback of these new possibilities is that it endangers the habits of the scholarly community, such as referring to specific pages, which is only possible with fixed pages.

Handbooks that require frequent updating and reference works are especially suitable for a digital environment and the new features of EPUB3. Financial and law books, dictionaries and technical handbooks, such as in computer science, can easily adapt to a digital environment.

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[51] M. Aaltonen, P. Mannonen, S. Nieminen and M. Nieminen, 'Usability and compatibility of e-book readers in an academic environment: A collaborative study', *IFLA journal,* 37 (2011), p. 25.
[52] Ibid, pp. 25-26.
[53] Williams, Stevenson, Nicholas, Watkinson and Rowlands, 'The role and future of the monograph in arts and humanities research', pp. 77-78.
[54] Thompson, *Books in the digital age*, p. 328.
[55] Daly, 'Digital monograph technical landscape'.

Monographs and textbooks are more difficult to translate into a digital edition, because of the specific reading habits regarding browsing and navigating that are developed for long-term academic reading, such as monographs that are based on a totalised understanding of the argument. Different scholarly works that are published in the sciences and the humanities can be adapted to a digital environment, but it is easy to see why the humanities are slower to adapt because of the important role that the monograph plays in this academic field. However, the new indexing options that are slowly being developed might benefit both monographs and textbooks, because it offers possibilities for navigating and browsing the book. Moreover, if a digital environment is more suitable for constant updating, cross-references and short texts, it is possible that in the future these features might be increasingly important in scholarly publications. Books are not only produced by the social system, but also determine the social and cultural practices, and if technology changes the book, this might change our academic environment as well. Academic publishers should, however, not abandon the types of academic books as they exists in our print heritage, but use the information about the current value and purpose of different types of academic books to explore digital possibilities for the future.

2.3: The boundaries of the book

The boundaries of what the book defines change in the digital age. As I have mentioned, several digital formats offer the possibility for responsive design as opposed to a fixed layout. Responsive design adapts the layout to the screen size of the various range of devices on which the user might display it and, as a result, the content and the layout become separate from each other. Mod explains the difference between formless and definite content as follows. Definite or fixed content uses the page as a canvas with dimensions and limitations and uses these attributes to elevate the object and content to a complete whole.[56] Formless or reflowable content is unaware of its container and '[...] does not see the page or its boundaries'.[57] In this section, the boundaries of the digital book will be discussed. While the future cannot be predicted beforehand, certain tendencies are already visible. These digital tendencies play an important role in the field of academic book publishing today and should be investigated in order to understand the ontological change of books in the digital age and, correspondingly, the tasks and role of the publisher. I will discuss three important characteristics of the digital book, namely the separation of digital texts from their physical container, the significant role that metadata play in the digital age and, lastly, the increasingly interconnection and interactivity that digital media render possible.

[56] Mod, 'Designing books in the digital age'.
[57] Ibid.

The first boundary of printed books is their physical container. It can even be stated that the book is just a container for the text and without the binding that keeps the text together, a writer's text is not a book, because a text is only a book when it is bound.[58] Books in the print age are solid objects that are gathered together as a series of pages in a coherent, and usually numbered, sequence and usually supported by its cloth, binding, printing, typography and design.[59] On a more conceptual level, it can be noted that books in the print age are characterised by copyright regulations, intellectual property and notions such as authorship.[60] All these aspects that bind the book both as a static object and coherent concept together change with – or at least have to be adapted to – the digital revolution. In a digital environment, the content has a separate existence from the form and the e-book does not have a binding at all. Moreover, the views about intellectual property rights are changing, while the traditional dichotomy between authorship and readership further blurs in the digital age.

The changing boundaries regarding the physical container of the book can be further investigated with Mod's concept of the printed book as an artefact system.[61] In the print age, books are part of an artefact system that is defined by the pre-artefact period in which the book is created and a post-artefact period in which the book as solid artefact is distributed and used by readers. According to Mod, there is a deeply interwoven interconnection between these periods in the digital system, which challenges the notion of completeness.[62] There is no longer a solid artefact that will be sent out into the world, but the digital text can be changed at all times. The post-artefact system is also truly interconnected in a digital environment, because of the interactive options that the Internet offers.[63] In other words, it seems that digital books have the potential to disrupt the concept of the book as a static and finished artefact.

Furthermore, it seems that several different copies of the same book can exist in a digital system. If a digital text can be fluid and changing, it will be easy to have different versions in various stages of the text that might not all be 'the finished, definitive form'. This can be interpreted as the opposite from printed books, which seems to have a standardised and static identity. However, it should be noted that printed books are often interpreted as stable and standardised, but this is only partly true. In Hall's interpretation, books in the modern age have the impression of being conceptually more tightly bound then they actually are, because even if a book is produced in a multiple copy print edition, each individual copy has its own singular existence in the life cycle of the

[58] G. Hall, 'The unbound book: Academic publishing in the age of the infinite archive,' *Journal of visual Culture*, 12 (2013), pp. 491-492.
[59] Ibid, p. 492.
[60] Ibid.
[61] Mod, 'Designing books in the digital age'.
[62] Ibid.
[63] Ibid.

book and is therefore different than the other copies.[64] This gives nuances to the notion of a static and stable identity of the printed book.

However, in most aspects printed books remain fixed, while digital texts that are based on responsive design and constant updating are fluid. In the academic community this difference is very important, because its scholarly practices depend on referring to specific locations in the text by means of page numbers. As I have mentioned, this is an important reason why PDF format is popular for scholarly uses of e-books. It also shows how academic reading habits can have an impact on the direction of the digital revolution, such as reading formats. As I have discussed, form and content are intertwined and our reading habits give direction to the digital revolution, while at the same time, the new digital practices have the potential to change our way of reading. If texts become increasingly born-digital, scholars might use responsive design as well, which means that they have to change their habit of referring to specific passages. This can potentially change our way of doing academic research and perhaps even our way of thinking about facts and knowledge. At the end of this chapter I will discuss this point in more detail.

The second important way that stretches the boundaries of books in the digital environment is metadata. Böing explains that the content of a digital text might still be king, but the metadata are clearly master.[65] Metadata provide a description of the content of the book and without this description the content of the digital book is practically useless, because accessibility and discoverability are of the greatest importance in the digital infrastructure. Metadata have a long history in the field of book publishing. Library cataloguers have always used metadata to describe the collection of books that the library held. In a digital environment, metadata is needed to describe the physical book for online shopping and distribution. Usually, this metadata consists of a basic set of tags or fields that often includes only ISBN, availability and price.[66] The rise of digital books brought metadata to a front office problem for publishers. E-books without metadata are practically invisible and therefore useless. Dawson explains the difference between metadata for printed books and digital books by stating that by e-books the '[…] metadata travels *with* the product, rather than separately'.[67] In other words, the metadata become part of the content of the book itself instead of a description of a separated object.

[64] Hall, 'The unbound book', p. 502.
[65] Böing, 'Editorial and production workflows', p. 198.
[66] L. Dawson, 'What we talk about when we talk about metadata', in H. McGuire and B. O'Leary (eds.), *Book: A futurist manifesto* (Sebastopol, CA.: O'Reilly Media, 2011), <http://book.pressbooks.com/chapter/metadata-laura-dawson> (7 April 2016).
[67] Dawson, 'What we talk about when we talk about metadata'.

How this stretches the boundaries of the book becomes clearer when we consider how metadata works. EPUB is an XML-based format from which the metadata is easily extracted.[68] The metadata can be stored in a layout independent file that travels with the electronic content of the book itself and it can be used to render various content formats possible. XML coding of the text and the metadata about the text provide machine readable data for various purposes, such as providing information as to where in the shop or library the book should be located.[69] The preparation of complete and consistent metadata allows for content packages to be clearly identified at any stage of production.[70] This makes also clear that not only the books and the reading culture of end-users are changing with the digital revolution, but the workflow of publishing houses as well. The electronical files need to be appropriately formatted in addition to be provided with adequate and correct metadata to allow for user discoverability in the new digital infrastructure.[71] The shape of the book is changing, because the discoverability is part of the electronic architecture itself and the workflow of the publisher is changing, because databases play now a central role in the company and are sometimes even the end-product instead of a physical object in the form of a printed book.

The third way in which the digital revolution stretches the boundaries of the concept of the book is the features for interconnectivity and interactivity that digital media offer. Printed books have a physical container and can be considered isolated objects, because they are solid objects in space. Scholarly references are a significant part of academic communication and they usually refer to other books or articles as separated objects with the use of page numbers. Page numbers have a clear function for book binding in the print age and are, according to Carpenter, practically useless in a digital environment, but scholarly habits and practices make clear that pagination still has a social value for references in the digital age.[72] The social value of page numbers explains why academic books are slow to adapt to a digital environment and why many of them look like copies of printed books formatted in PDF files, lingering on one side of Elliott's continuum between printed and born-digital texts.

Digital publishing can result in a greater connectivity between texts than printed books – that refer to other books or articles as isolated objects – assume.[73] Digital texts are interconnected in the database in which they are stored and hyperlinks transfer the reader directly to other texts in digital platforms. In a digital environment, books are no longer isolated objects, but directly connected to

[68] Dawson, 'What we talk about when we talk about metadata'.
[69] Böing, 'Editorial and production workflows', p. 198.
[70] Ibid, p. 200.
[71] Ibid, p. 197.
[72] T. Carpenter, 'Electronic publishing standards', in . R. Campbell, E. Pentz and I. Borthwick (eds.), *Academic and professional publishing* (Cambridge: Chandos Publishing, 2012), p. 217.
[73] K. Fitzpatrick, *Planned obsolescence: Publishing, technology and the future of the academy* (New York: New York University Press, 2011), p. 89.

each other in ways in which the boundaries between the books – and potentially other digital media – blur. In Fitzpatrick's view, we have to go beyond our e-book mentality that compares digital books to the way the book looks in the print heritage in order to make optimal use of digital platforms and develop wholly new textual structures.[74] A good example of a new textual structure is CommentPress, initiated by the Institute of the Future of the Book.[75] CommentPress is a blog-based publishing engine that intends to view books as 'networked objects' and can be used as a plug-in for fixed documents, such as digital books.[76] Fitzpatrick was one of the testers of the plug-in and she explains why CommentPress offers interactivity in two fundamental ways.[77] Firstly, it structures long-form texts around chunks that can be interlinked in linear and non-linear fashions and it has the ability to link to other texts in the network. Secondly, it offers the ability to comment on these texts – on the whole document or individual paragraphs – which renders interactivity between readers and authors possible. In other words, books are no longer isolated objects in a digital environment, but they have the potential to become networked objects in the database.

2.4: Design and navigation

The boundaries of the book are stretching in significant ways in a digital environment: digital books are no longer static and material objects, but they become separated from their physical containers, discoverability is determined by relevant metadata and digital books have the potential to become interconnected networks of various texts and interactive platforms between authors and readers. In this section, I will focus on the impact of these fundamental changes of the shape of the book on the ways in which readers and authors use and navigate these texts in an academic context. The different ways of navigation will demonstrate that the transition to a digital environment is a fundamental and ontological change. Not only the books are bound to change, but the way they are written, published and used as well, which will have a profound impact on the field of academic book publishing as well as the way scholars create and think about the texts that they produce. As Thompson points out, many academic researchers – especially authors in the humanities and social sciences – are hesitant about the idea of publishing their book in a digital environment only, because they are deeply attached to the printed book as an expression of their research and these printed books are deeply embedded in the reading culture of academia.[78] Hence, I will keep in mind that

[74] Ibid, p. 95.
[75] The Institute of the Future of the Book, 'About CommentPress', <http://futureofthebook.org/commentpress/about-commentpress> (6 June 2016).
[76] The Institute of the Future of the Book, 'Welcome to CommentPress', < http://futureofthebook.org/commentpress> (6 June 2016).
[77] Fitzpatrick, *Planned obsolescence*, p. 109.
[78] Thompson, *Books in the digital age*, p. 373.

most academic books are published both in printed and digital format and analyse this hybrid reading culture.

The most basic way of navigating through a book is how we get from the beginning to the end of the text. In the reading culture of printed books, readers are used to flip through the text page by page and they use page numbers to refer and navigate through the different sections of the book.[79] The contents, index and footnotes are important means of navigating through printed books as well. In a digital environment, the texts are more fluid and readers have to navigate through them by scrolling in the case of laptops and tablets and clicking on the screen to the next page in the case of e-readers. Page numbers are still used in many documents, such as books that are stored in PDF files, but are less obvious in a digital environment. If the text becomes responsive and adapts itself to the screen size of the device on which it is displayed and readers can choose their preferred typeface and character size, pages are no longer fixed and definitive and page numbers might lose their value as way of referring to a specific location in the text.

Furthermore, as it is often mentioned, readers make use of the index at the back of the book and the contents at the beginning in order to identify and locate particular information within the book and to get an idea of a book's scope and detail and the nature of a particular subject in the reading culture based on printed books.[80] A concern that is sometimes expressed is that the profession of indexing will be replaced by information retrieval by machine.[81] A digital search engine often relies on a mechanical algorithm instead of a human expert in the specific field of research who usually composes the index. Readers can find the right location in the text by means of full-text search. The main difference is that an index composed by an expert shows the reader a list of meaningful concepts and names that appear in the book and full-text search provides a list of all the locations in the text where the search term appears. This means that concepts cannot be easily found in a digital environment. Metadata can be used to navigate full text search more carefully with, for example, the use of tagged names and places.

How does full text search in digital interfaces for academic books work at the moment? In order to illustrate the possibilities for indexing in a digital environment, I will summarise the features of the search options that the online HTML edition of the Open Humanities Press's digital interface offers. The Open Humanities Press (OHP) is in an international independent volunteer initiative that has been promoting open access and new forms of scholarly communication since 2006.[82] In the

[79] Soffer and Eshet-Alkalai, 'Back to the future', p. 52.
[80] C. Barnum, E. Henderson, A. Hood and R. Jordan, 'Index versus full-text search: A usability study of user preference and performance', *Technical Communication*, 51 (2004), p. 186.
[81] Ibid.
[82] Open Humanities Press, 'Community', <http://www.openhumanitiespress.org/about/community/> (6 June 2016).

HTML edition of the book[83], there is an advanced search tool available. The advanced search function helps readers to make optimal use of the possibilities by providing various search tools and explanations about basic, Boolean, proximity and bibliographical search options. The Boolean search option allows readers to combine multiple queries, while the proximity search tool provides the possibility to search for keywords that appear within a certain distance with other keywords. The bibliographical search option allows readers to search for specific titles, authors and citations in the text, which means they are encoded as such in the database with the use of metadata. It is also interesting to note that the search option that is provided in the interface of a specific book includes the entire database of all books ever published by OHP. It is possible to search within the specific book or all the books that the specific author has published by OHP, but this is an act that needs to be taken by the user.

As already mentioned, more complex possibilities for indexing in a digital environment are slowly opening up.[84] Consequently, in the future, there might be more possibilities for indexing in a digital environment. It is clear, however, that the reader becomes more responsible for selecting the right search results and deciding the amount of text that needs to be searched in a digital environment than when reading printed books – even when publishers and authors have tagged certain key terms by means of metadata. Moreover, when navigating through a digital book the reader is transferred to the preferred location in the text by means of hyperlinks, while reading printed books requires flipping through the pages and locating the right page numbers. Browsing through the pages might result in a more comprehensive understanding of the scope of the book and the specific location of the found passage, than getting automatically transferred to the location where the search term appears. Hence, the understanding of digital books might be more fragmentary. Viewed in this way, it is easy to understand why monographs – that are based on long-term reading and comprehension of the whole argument in a book – are more suitable to be published in printed form than in a digital format.

In our current hybrid reading culture, digital options for full text search and the comfort of browsing through printed books can be used next to each other. In order to navigate this hybrid landscape adequately, publishers have the responsibility to be aware of the different features of printed and digital books and the usage of readers. It is, however, also important to note that traditional values associated with the print heritage might slowly change or vanish in the future. Texts become more fragmented as well as interconnected in a digital environment. This has an impact on scholarship and academic authorship as well. The Internet offers the possibility to view

[83] See for example, J. Nechvatal, *Immersion into noise* (Open Humanities Press, 2011), <http://quod.lib.umich.edu/o/ohp/9618970.0001.001> (6 June 2016).
[84] Daly, 'Digital monograph technical landscape'.

books as being '[…] open to being continually and collaboratively written, edited, annotated, critiqued, updated, shared, supplemented, revised, re-ordered, reiterated and reimagined'.[85] Ideas that are not yet finished and fragments of information or data can be easily shared and commented on before a 'final form' is published as far as a 'final publication' will still exist in a digital future. Hall suggests that the process of creating new texts and interactions about the source material might become the main driver of academic research, while the publication of books might become a by-product of this process rather than the end goal.[86]

If the publication of books becomes a by-product in the academic community, the practice of referring to specific locations in the text by means of page numbers vanishes and books are constantly updated instead of static objects, then it would seem that not only our way of reading and publishing changes, but our way of doing research and thinking about knowledge as well. It can be argued that printed scholarly books offer static knowledge that is printed on fixed pages that we can refer to. Moreover, in the case of monographs, knowledge is based on a totalised understanding of the whole text. In a digital environment, books – or 'texts' – have the tendency to become increasingly fragmented and interconnected. While it is more difficult to refer to specific locations in the text in the traditional way, there is more potential for interactions between readers and authors on, for example, blogging platforms. Not only books might become networked object, as Fritzpatrick argues, but, according to Weinberger, knowledge itself becomes networked.[87] Weinberger argues that knowledge becomes a verb in networked communities where the information is discussed. This means that knowledge will become inextricable from its social context; it is no longer a static object to which we can refer, but a process in networked communities were everyone has the right to speak. This will significantly change the landscape of academia and our thinking about knowledge and facts.

2.5: Conclusion

The digital revolution causes a shift from print to digital in the publishing industry. Books are slower to adapt than journals, because of the specific conventions of the printed book. This is especially true for the academic book that is embedded in a research environment with specific habits for reading and references. Hence, the digital revolution is a transition that takes place at a different pace for academic books. Today we live in a hybrid reading culture in which printed and digital texts both play an important role in an academic environment. The shape and design of academic books are changing in a digital environment. Digital books are immaterial, discoverability is included in the

[85] Hall, 'The unbound book', p. 497.
[86] Ibid, p. 499.
[87] D. Weinberger, 'Rethinking knowledge in the internet age', *Los Angeles review of books*, 2 May 2016, <https://lareviewofbooks.org/article/rethinking-knowledge-internet-age> (19 November 2016).

architecture of the book with the use of metadata and interconnectivity and interactivity play an increasingly important role in a digital environment. Furthermore, reading and writing is in the digital age different than in the print era. All these changes do not only suggest a change in reading, writing and publishing, but in our way of doing research and the concept of knowledge. In the next chapter, I will elaborate on the role of the academic publisher in this digital society.

III. The role of the academic publisher

'Think about it for a minute: does the prospective author any longer require the traditional publisher for all, or indeed for any, of these services [that are traditionally associated with book publishing including deciding to publish the book]? […] So the publishers' traditional role as the "gatekeepers of culture," the arbiter of the many decisions that go into making a book "public," the source of distribution, the fount from which the printed word has traditionally been issued, is now in serious doubt.'
- David R. Godine[88]

The digital revolution is transforming the field of academic book publishing profoundly. The meaning of what a book is, is changing in a digital environment, because of the impact of the endless interactive possibilities of the Internet, the materiality of the book that fades away in a digital world and the importance of metadata. Furthermore, the experience of writing, reading and navigating in a digital environment is different than in the age of the printed book for readers and authors. At the moment, we still live in a time of transition from print to digital. This transition phase is especially visible in the case of academic books, because they adapt slowly to a digital environment. This leaves a difficult task for publishers to navigate this hybrid landscape successfully. I will argue that not only the tasks of the publisher change in a digital environment, but that the digital publication system asks for a different role and attitude of the publisher. Godine, who owns a small independent publishing house in Boston, states that the traditional role of the publisher as gatekeeper is slowly vanishing. Instead, the question whether the services of the publisher are needed in our future society becomes relevant.

In this chapter, I will explore this question regarding the role of the academic book publisher in the digital age. Firstly, I will globally discuss how the production of the academic book in the digital age changes the tasks of the publisher and his role in the field of academic book publishing. Secondly, I will explain the user-central approach that becomes increasingly important for publishers to keep in mind in the digital world of big data. Thirdly, I will answer the question how publishers can add value to the academic book. In order to do this, the various functions of the academic publisher will be discussed. Finally, I will argue that the cultural and intellectual role of the academic publisher is of the greatest importance in our digital society.

[88] D. R. Godine, 'The role and future of the traditional book publisher', *Publishing research quarterly*, 27 (2011), p. 335.

3.1: The field of academic book publishing

The academic book can be interpreted as not only the end-product of the author that is distributed by the publisher, but as an active agent that has an impact on the life cycle of the book, which includes readers, authors, publishers and libraries. In this section, I will look in more detail at this field of academic book publishing and how the digital revolution has impacted the various parties. In this way, the position of the academic publisher in relationship to the other parties in the field becomes clearer. I will explain the impact of the digitisation of society on the workflow of the publisher. Moreover, I will elucidate how this impacts accessibility, discoverability and dissemination of the academic book in the field of the publishing industry. The main focus is how publishers relate to this field and not to elaborate on each player, such as libraries and authors, extensively, because that is outside the scope of my thesis.

The workflow of the academic publisher has become digital. Thompson calls this the revolution in the process of publishing a book.[89] This makes clear that even though printed books still play a big role in academic book publishing, the field is changing in the digital age and, consequently, so is the role of the publisher. For example, in the early 1990s, the typesetting business was completely taken over by desktop publishing.[90] This change aligns with the shift from typewriters or pen and paper to word processing on a computer.[91] These digital transitions seem small and harmless at first sight, but they cause a profound change in the workflow of the typesetter and publisher.[92] The traditional system needed to be adapted to a new digital system. One of the consequences was that authors – who were used to typewriters – made many mistakes with the new system, which required of publishers that they outsourced this process and that these basic mistakes needed to be corrected before the file would be sent to the copy-editor.[93] Besides, copy-editors needed to change to onscreen editing which was a big change in their workflow.[94]

The impact of the seemingly small transition to digital workflows illustrates how the transition of the book in its preliminary stage from typescript to digital file changes the life cycle of the book that includes among others publishers, editors, authors and typesetters. Every step in the process of the production of the book is interconnected. Digital files are now a key factor in the production workflow, because the data of which the file of the book consists is considered more valuable than the printed version – if there is a printed edition at all.[95] Hence, reliable methods of storing these files should be developed in order to secure the digital files for future editions, re-

[89] Thompson, *Books in the digital age*, p. 405.
[90] Ibid, p. 406.
[91] Ibid, p. 407.
[92] Ibid, pp. 406-407.
[93] Ibid, p. 407.
[94] Ibid, p. 408.
[95] Ibid, p. 412.

printing, selling the book as e-book, putting the book in a print-on-demand scheme or for marketing purposes.[96] Aside from the changes in typesetting, editing and storing, the printing process is transformed by the digitisation of society as well. The advantages of traditional offset printing are that the quality is in general very high and that the costs per page is low when the printing job has been set up, but this makes it only suitable for long print-runs.[97] Digital printing, on the contrary, is suitable for short print-runs, because the costs of the initial print set-up are lower. Therefore, digital printing can be considered as the condition of printing-on-demand publishing. POD is a useful publishing model where books are only printed when they are requested.

The production of the book clearly changes in the digital age. The further life cycle of the academic book is transforming as well. Publishers operate in a field that consists of different parties and stakeholders who play a role in the life cycle of the book. Thompson borrows the term 'field' from the French sociologist Bourdieu and applies it to the publishing industry. According to Thompson, a field is a structured space of various social positions '[...] which can be occupied by agents or organizations, and in which the position of any agent or organization depends on the type and quantity of resources or "capital" they have at their disposal'.[98] The agents or organisations that play a role in the field of academic book publishing are, for example, the scholarly community, academic libraries, academic publishers and university presses. They have different kinds of quantities of power and resources and a variety of practices and their relationship with each other can be of collaboration, competition or reward.[99] Later in this chapter, I will elucidate the different functions of the publisher, which are based on the resources that a publisher has at his disposal. First, I will discuss the changing collaboration between academic publishing firms and libraries and the scholarly community in the digital age.

Libraries play an important role in the dissemination of scholarly information. Traditionally, they have taken responsibility for access to and preservation of printed scholarly materials and make this available to end-users.[100] For example, they create catalogues for printed books, hold copies of publications long after publishers have merged or gone out of business and provide adequate storing conditions for long-term preservation of books.[101] The existence of libraries depends to a large extent on information resources from publishers and the division of roles between these two parties in the information chain is of crucial importance and might change with the digital distribution of scholarly

[96] Ibid, p. 413.
[97] Ibid, p. 421.
[98] J. B. Thompson, *Merchants of culture: The publishing business in the twenty-first century* (Polity Press: Cambridge, 2012), pp. 3-4.
[99] Ibid, p. 4.
[100] C. L. Borgman, *Scholarship in the digital age: Information, infrastructure, and the internet* (The MIT Press: Cambridge and London, 2007), p. 81.
[101] Ibid, pp. 81-82.

knowledge.[102] In the digital age, it is important that academic books are discoverable online and, in the case of e-books, accessible online. These are tasks that are for a great part accomplished by libraries that have an intermediary function between publishers and end-users and they use this function to educate the higher education community on scholarly communication in a digital landscape.[103]

This means that the dissemination of academic books depends on a successful collaboration between publishers and libraries and the division of tasks between them. For example, digital formats and metadata need to be aligned and librarians and publishers have to change their role to providing access and looking into the needs of end-users in order to make digital interfaces user-friendly and the publications easily discoverable online. The question which party in the life cycle of the book pays for digital publications plays an important role as well. A fruitful initiative that relies on the collaboration between various stakeholders is Knowledge Unlatched. In the business model of this project, libraries that have joined Knowledge Unlatched share the costs of an academic book in the form of a fixed title fee.[104] This means that publishers gain access to funding to cover the costs of publishing scholarly monographs while in exchange libraries can distribute the books in open access and make them accessible to end-users. This example illustrates that collaboration between publishers and libraries is crucial to navigate the digital landscape successfully.

Furthermore, the digital revolution has an impact on the relationship between the scholarly community and publishers. In the field of academic book publishing, the scholarly community includes often both authors and readers. Scholars create knowledge, need to have their research published and would like to distribute their books among peers and gain access to other scholarly information. Publication becomes for scholars increasingly more a stage in the longer process of temporal unfolding of making their research accessible.[105] The role of the publisher as gatekeeper or filter of information becomes less obvious when options for self-publishing increase. Self-publishing is, however, less popular in the field of academic book publishing, because academic publishing is based on complex relationships between stakeholders.[106] Authors need peer-reviewers and rely on the skills and network of the publisher to successfully bring their work into the academic world and on the library to provide access to their work. Nevertheless, the role of publishers is no longer taken for granted and they need to earn their position by providing useful services to authors. The same is true for the reliability of digital books: publishers need to invest more to earn their status as reliable

[102] M. Natarajan and S. Kaliyan, 'Roles of libraries and publishers in knowledge access and management', *ICAL – Vision and roles of the future academic libraries*, (2009), p. 162.
[103] Ibid, pp. 159-160.
[104] Knowledge Unlatched, 'Good for publishers' <http://www.knowledgeunlatched.org/good-for/publishers> (6 June 2016).
[105] Hall, 'The unbound book', p. 497.
[106] Borgman, *Scholarship in the digital age*, p. 76.

publishers in the digital world than in the print world, because digital books are subjected to a higher level of scrutiny than print publications.[107]

In short, the digital revolution changes the workflows of the publisher as well as his relationship with the various parties in the field of academic book publishing, such as libraries and the scholarly community. This requires a new view on the role of the publisher and on his relationship to stakeholders. It becomes increasingly important for publishers to make themselves relevant instead of taking their traditional role for granted and show that they can adapt to the digital infrastructure and the changing demands of the field that they operate in. Although a more detailed account of the roles of the librarian and scholar lies outside the scope of my thesis, this short analysis sheds a light on the context in which the changing role of the publisher should be understood. Moreover, it emphasises the importance of critical reflection about the role of the publisher in the life cycle of the book. Librarians and publishers should reflect on their role and search for a division of tasks in the digital age and publishers need to make their services relevant to the scholarly community and build a brand in the digital world.

3.2: Big data and the user-central approach

One of biggest changes in the workflow of the publisher in the digital age is the increasingly important role of data. As Hildalgo writes, one of the known facts of the process of becoming digital is that every step of the way can be measured and every piece of data can be stored and analysed.[108] This aligns closely with the changing relationship between publisher and end-user. Traditionally, publishers have created products for end-users that they have no interaction with or think much about.[109] Printed books are often distributed to wholesalers who deliver the books to institutions, such as libraries.[110] However, the transition to a digital environment changes this situation. For the first time, publishers have to take the experience of users into account in order to attract users or customers to their web site if they offer their own digital interface and make their digital content attractive and relevant for users.[111] In this section, I will elucidate the role of the publisher by the experience of the end-user. Moreover, I will explain the role of data by analysing the user's behaviour and introduce the question what publishers should do with the gained data.

[107] Ibid, p. 78.
[108] J. Hidalgo, 'Data science in the book publishing industry: To be or not to be', *Smart book: Technology and innovation for smart publishing*, 8 June 2016, <http://www.smartbook-tisp.eu/resources/data-science-in-the-book-publishing-industry-to-be-or-not-to-be> (17 June 2016).
[109] J. van Baren, 'Relating content to the user', in . R. Campbell, E. Pentz and I. Borthwick (eds.), *Academic and professional publishing* (Cambridge: Chandos Publishing, 2012), p. 271.
[110] Thompson, *Merchants of culture*, p. 15.
[111] Van Baren, 'Relating content to the user', p. 271.

Reading and searching for information in a digital environment is very different for end-users than navigating through printed books. As I have discussed, scholars and students are used to a specific way of browsing and navigating that is important for academic reading and these features are not easily translated to a digital environment, and especially not to small devices, such as e-readers and smart phones. Books are therefore slower than journals to adapt to a digital environment and many developments in the field of data analysing and search engine optimisation are more visible in the field of journal publishing, but the digital revolution still has a significant impact on the field of academic book publishing.[112] The data of online customers and users can be tracked when printed books are sold online in web shops or when e-books are distributed on an online platform that is owned by the publishing firm.

Hidalgo states that it is a common mistake for publishers to forget why they started looking into a specific dataset and just dive deeper and deeper into it.[113] Consequently, business goals should be clearly formulated beforehand and kept in mind. There are possibilities for data tracking and user personalisation when books are published or distributed in a digital environment, but what is the purpose of this? As I will explain, semantic technologies open new possibilities, but it is important to think about what publishers would like to accomplish with data tracking and user personalisation instead of blindly following the latest possibilities, simply because publishers do not want to be left behind in the digital market. Insight into the behaviour of users is especially relevant for the field of academic book publishing. Elliott's continuum ranging from digital books that resemble the print heritage as closely as possible to born-digital texts that are no longer suitable for print publication illustrates that many digital books are just printed books only in PDF format.[114] According to Van Baren, this approach does not take the experience of users into account and fails to take advantage of the possibilities to make digital content more attractive and relevant for users.[115] Publishers face the task to make an effort to make their online publications useful for readers, both in the case when the text is only published digitally and when the online publication is an addition to the print edition. Navigating, searching, referring to specific locations in the text and indexing are aspects that function differently in a digital environment than in the print heritage and need therefore special attention from publishers when they publish digital books.

In order to get more concrete insight into what publishers can do to optimise user-friendliness in a digital environment, it is important to focus on the experience of the end-users. What are the challenges for users when they search for books online or read digital books? The Elsevier User Centred Design team has conducted market and user research between 2002 and 2012

[112] Clarke, 'The digital revolution', p. 95.
[113] Hidalgo, 'Data Science in the book publishing industry'.
[114] Elliott, 'The future of the monograph in the digital era'.
[115] Van Baren, 'Relating content to the user', p. 271.

that points out several key-recurring challenges for scientific researchers by effectively gathering information.[116] The biggest challenge for researchers is the information overload that is caused by the many different sources that the digital environment offers.[117] The different databases, web search engines, library catalogues and blogs make it increasingly difficult and ask for a great investment of time for researchers to find the right information that they are looking for. This means that new expectations arise for publishers. In which platforms should digital books be published? How can the different platforms and digital tools that are available to scholars be integrated? If publishing houses have their own database they would like to present their platform in a way that is user-friendly enough to attract scholars to their web site. Further results from Elsevier's market and user research point out that scientific researchers find it difficult to find the right facts, answers and ideas in digital sources and to determine the quality and authority of the sources that they find online.[118] These struggles ask for a new way of thinking about search and discovery tools and ways of branding and peer review that function properly in a digital landscape.

These new challenges in the digital age shed a new light on the relationship between form and content. As I have discussed in the previous chapter, many views on the death of the book as container of content or the liberation of information from the limits of technology are based on the disentanglement of form and content. Scholarly information has in the print age a clear and 'definitive' container in the form of a book or journal article. In the digital age, the content becomes separate from the form and sometimes depends on responsive design and the features of the interface are different for digital books in terms of materiality, page numbering, table of content and index. The form of books has an impact on the content, while the content influences the form. I would like to propose that new ways of connecting content and design is one of the most important factors for successful publication in the digital age. This aligns with Van Baren's view that integration of content and technology is the key.[119] Besides, it sheds a new light on Thompson's interpretation of the role of publishers in the digital age, which includes that publishers should focus on the digital formats in which the content needs to be stored.[120] There is a risk that the publisher focuses too much on design or only on the content, while in reality they are two sides of the same coin. The quality and relevance of the content need to be supported by a user-friendly interface in order to successfully publish digital texts.

What can publishers do to integrate the content with form and gain insight into the experiences and wishes of the end-users? It is in this role that data mining becomes important. The

[116] Ibid, p. 273.
[117] Ibid, p. 274.
[118] Ibid, pp. 274-275.
[119] Ibid, p. 281.
[120] Thompson, *Books in the digital age*, p. 375.

online behaviour and history of users, such as the items that they have viewed, search history and features that they have utilised can be used to personalise the interface and make it user-friendlier.[121] In this way, publishers can make their web shops or digital platforms more attractive for users and customers. These forms of data mining are rendered possible by semantic technologies that provide a layer of metadata to content that allows computers to understand the content and make meaningful connections.[122] XML provides information about the structure of a document, but it does not tell the computer what the content in a document is about, while semantic technology provides an extra layer that connects data in a meaningful way. This linked data is the driving factor of Web 3.0, but the semantic technologies that are of interest to publishers are invented independently of the larger developments in this area.[123] Publishers can utilise technology that enriches content for specific use cases, such as search engine optimisation and user personalisation.[124]

Search engine optimisation depends on semantic metadata that are based on specific jargon in the academic field and is provided by a specialised publisher. Besides, sometimes search results can show synonyms of the term – provided by a specialist – that the end-user searched for.[125] User personalisation is not based on enriching the content but on better understanding the user's reading, searching and browsing interests. Examples of this are automatic content recommendations, optimisation for the interface and personalising the results from search tools.[126] The new features of user personalisation and search engine optimisation are not without critique. If the recommendations and search results are personalised for the end-user, he will mostly see and read information that aligns with his current opinions and worldviews. This might be a danger for critical thinking, because end-users become less aware of evidence and arguments that do not align with their views. This risk should be an important topic for debate for both the scholarly community and the publishing industry.

In the past, publishers did not have to concern themselves much with the users of the books that they published. They mainly interacted with librarians and wholesalers and they interacted more with the scholarly community as authors than as readers. The transition from print to digital is changing this situation. The experience of readers with interacting with digital books is profoundly different than their interaction with physical books, which challenges publishers to find new ways to integrate form and content. Moreover, publishers are expected to present their content in a

[121] Van Baren, 'Relating content to the user', pp. 276-277.
[122] Clarke, 'The digital revolution', p. 93.
[123] Ibid, p. 94.
[124] Ibid, pp. 94-96.
[125] Ibid.
[126] Ibid.

relevant, user-friendly and attractive way in order to keep the end-user's attention. New digital skills, such as data mining, play an important role in these tasks. As Van Baren states, the core competencies of publishers need to be extended in order to understand how users interact with content and to take advantage of the possibilities of the digital environment.[127] In the next two sections, I will take this view a step further by arguing that it is not simply a matter of adapting competencies to a digital environment, but of a fundamental change of the role of the academic publisher and his relationship with the other parties in the life cycle of the book.

3.3: Functions of the academic publisher

The digital revolution has not only an impact on the shape of the book, but the stretching boundaries of the book in a digital environment have an immense impact on the whole life cycle of the book as well. Academic publishers have to earn their status and show that they have relevant services to offer to other parties in the field of academic book publishing. This means that their relationship with other parties, such as libraries and the academic community, changes. Publishers need to actively examine where they can add value and collaborate with other parties to achieve their goals. Moreover, for the first time they need to really look into the experiences and preferences of end-users in order to offer attractive and suitable digital publications and interfaces. In other words, academic publishers face a challenge to ensure that '[...] they remain a key point of passage in the scholarly communication cycle [...]'.[128] In this section, I will explain the impact of the digital revolution on the functions of the academic publisher with use of Thompson's model in which he explains where publishers do add value.[129] In order to limit myself to the scope of my thesis, I will discuss the six functions of the publisher that Thompson mentions through the lens of the production of the academic book.

According to Thompson, content acquisition and list-building is in many ways the key function of the publisher.[130] The publisher is not just a cultural filter or gatekeeper but plays in many cases a proactive role with acquiring and helping to create content that will turn into the books that comprise the publisher's list.[131] For example, publishers might help to turn an idea of the author into a fruitful project or come up with ideas of their own for books that they will find suitable authors for.[132] Dodds, the former editorial director at Woodhead Publishing, argues that the publisher's

[127] Van Baren, 'Relating content to the user', p. 284.
[128] J. Stewart, R. Procter, R. Williams and M. Poschen, 'The role of academic publishers in shaping the development of Web 2.0 services for scholarly communication', *New media & society*, 15 (2012), p. 429.
[129] Thompson, *Books in the digital age*, pp. 24-26.
[130] Ibid, p. 24.
[131] Ibid, pp. 24-25.
[132] Ibid, p. 25.

proactive role in defining and shaping content becomes stronger in the digital age.[133] In his interpretation, this trend is more visible in market-leading academic publishing houses than university presses, because of the competitive role of these publishing companies.[134] There is a pressure on authors to conform to the business models and digital landscape that the publisher is working with. Scholars work under an increasing pressure to publish for career progress and research funding and to specialise in narrow fields and do not always produce the kind of information that users most need.[135] This can be the opposite goal for publishers who increasingly need to publish books that are relevant for a sufficient number of end-users. The publisher needs to understand the end-user in order to align with user workflows as well as how books can best fit into a digital environment.[136] This suggests that publishers increasingly offer their service as list-building to end-users next to offering it to authors. To what extent do publishers offer their services to authors and readers and wait for digital developments in the field to happen or actively steer authors into a digital solution, such as encouraging authors to write texts for digital publications or encourage readers to use digital platforms and devices for reading? In the next section, I will look into this question more deeply.

The second function of the publisher is financial investment and risk-taking. The publisher often invests in a project by paying advances to authors and by covering the costs of acquisition, development and production of the book.[137] In this case, the publisher takes the risk associated with the publication of a book, but new financials models where stakeholders share the investment and risk are developed as well. In the scope of my thesis, it is especially important to note that publishers do not have unlimited resources and would like to earn profit from the books that they are publishing or – at the very least – to earn enough money to be able to remain in business. Even university presses, who often receive funding from their corresponding universities, need to make a profit. The question who invests in the publication of a book becomes a front-office challenge in the digital age, because consumers are getting increasingly used to free access to online information. Initiatives, such as Knowledge Unlatched, that are based on sharing the investment between different parties in the life cycle of the book enable the publisher to share the risk of an investment. In my interpretation, the challenge of finding funding for the publication of books opens up possibilities as well. As discussed, the monograph crisis has revealed that many monographs are almost never read or requested by readers. The collaboration between publishers and librarians

[133] F. Dodds, 'Changes in the role of the commissioning editor in academic book publishing', *Learned publishing*, 28 (2015), p. 35.
[134] Ibid, p. 39.
[135] Ibid.
[136] Ibid, p. 41.
[137] Thompson, *Books in the digital age*, p. 25.

might result in a more efficient and healthy life cycle of the book, in which books are published – whether in print or digital – because they are useful for readers. It is important for publishers to think about why they are investing in a particular book and why they are choosing for a print or digital edition or a combination of both.

The third way in which publishers add value is by the development of content. In this role, the publisher adds value to the text by actively shaping the text or providing services, such as editing, picture research and copyright clearance.[138] Digital content delivery provokes the question which formats and platforms are the most suitable for publication of a particular book. In our hybrid reading culture, this means deciding if a book should be published in print, digitally or both. The answer to this question depends not only on the wishes of the author or the financial possibilities of the publisher, but on the user-friendliness of the format as well. What is the goal of a certain publication and does the format serve the users to achieve these goals optimally? In other words, does the shape of the publication make it as relevant as possible for the experience of the readers? This encourages publishers to think, for example, about the role of indexes in a digital environment. It might be easier for publishers to provide a digital version of a book in PDF format that resembles the printed edition as closely as possible, but does this take advantage of the digital possibilities? Publishers can also think about the user-friendliness of the books by the development of content. They might, for example, invest in relevant metadata that makes online searching easier. It is also possible to publish the metadata together with the digital book in order to let it serve as an index.[139] In the digital age, the development of content is not only an agreement between author and publisher, but depends on the user-friendliness for future consumption of the content as well.

Quality control is the fourth function of the publisher that Thompson mentions. The publisher would like to build a distinctive profile and brand in the publishing field.[140] In order to achieve this, he needs to ensure that the books meet certain standards, which can be based on the judgment of internal editors or external peer-reviewers. In the digital age, scholars will be far less likely to publish their academic research in just one place and will rely on multiple and decentred online spaces and media forms, such as WordPress, where authors and readers can interact with each other.[141] Scholarly communication relies, however, on certain conventions, such as peer-review and the publication of monographs for career progress, which will not suddenly disappear.

Consequently, the traditional role of the publisher regarding organising peer-review will still exist in the digital age, but I would like to argue that this role is extended to guiding end-users through the overload of digital information. As I have explained, scholars have difficulty finding the

[138] Ibid.
[139] Van Baren, 'Relating content to the user', p. 278.
[140] Thompson, *Books in the digital age*, p. 25.
[141] Hall, 'The unbound book', p. 489.

right information in a digital environment that offers many different sources. Catalogues, databases and web search engines attempt to help users to find information, but because there are so many, the sources might become scattered. Publishers can use their expertise with quality assessment to provide platforms – for example, in collaboration with libraries – that guide end-users through reliable information. A clear distinction between end-products in the form of, for example, books and blog posts that might be work in progress can be made by the publisher. As post publication quality control in the form of online commenting becomes more popular, a clear distinction can be made between the authority of peer-reviewers that are selected by publishers who have an excellent brand in the publishing field and comments from scholars and other readers.[142] In this way, end-users can navigate successfully through the digital landscape with help of the brand name of the publisher that guides the readers by accessing high quality information.

The fifth function of the publisher is management and coordination, which includes management of specific projects and overseeing the various phases in the production and life cycle of the book.[143] Managers who work at publishing houses have the expertise to deal with decisions that must be made regarding outsourcing activities, such as editing, and copyright contracts, prices and print-runs and stocks in the case of printed books.[144] These activities become more complex in the digital age, because of the increasing need of ICT skills and pricing and copyright works different in a digital environment than in the print age. At first sight, the fundamental role of the publishing firm regarding management does not seem very different in the digital age. However, I would like to argue that this function aligns closely with Thompson's concept of 'the logic of the field'.[145] According to Thompson, each field of publishing – in this case, academic book publishing – has a distinctive set of factors that determine the conditions under which the individuals can play the game successfully. This is not a set of rules that can be learned in theory, but an unwritten logic that can be learnt by gaining experience in the publishing field. In my view, it is this logic that helps specialised managers to successfully coordinate activities and that might become very useful by the transition to electronic publishing. Having an overview of the activities that are needed by the publication of a book and how the different parties operate in the field is of value by the changes that are happening at the moment.

The last function of the publisher that Thompson describes is sales and marketing. This function includes the range of activities concerned with informing potential customers of the availability of the books and encouraging them to order it and informing the bookseller chain and

[142] Borgman, *Scholarship in the digital age*, p. 59.
[143] Thompson, *Books in the digital age*, p. 25.
[144] Ibid.
[145] Thompson, *Merchants of culture*, pp. 11-12.

wholesalers of forthcoming books.[146] In the electronic age, the online discoverability of both printed and digital books is of crucial importance. Books need to be found on platforms and web sites that attract potential customers. For example, online catalogues, mailing lists and social media become increasingly important. The digital age encourages publishers to engage with an online network of scholars and libraries. This network can vary for different types of academic books. Specialised monographs acquire a close network of scholars in the field of a particular specialisation and maintaining that network might include promoting books at conferences or mailing lists about specific subjects. More general textbooks and dictionaries can best be promoted at universities in order to encourage teachers to include the books on the reading lists of their courses. In all cases, however, online discoverability will be the key factor that determines the success of the sales of a book.

In addition to Thompson's functions, I would like to propose a seventh function that the publisher should fulfil in order to become a successful player in the digital environment of academic book publishing. This function focuses on the integration of knowledge into the digital system in which books can be published. It aligns with the stretching boundaries of the book that I have discussed in the previous chapter. Digital books are often connected to each other by means of the database in which they are stored. Books become 'networked objects' that can be linked to each other in a non-linear manner and can be easily commented on by readers. In order to make optimal use of these digital possibilities, publishers can go beyond the e-book mentality that compares digital books to the way books function in the print heritage. In my view, this is possible when publishers embrace a new function in addition to their old ones, namely providing interconnectivity and interactivity. A digital book is no longer an isolated object, but it is part of a database and online community that readers, authors and researchers would like to use optimally. This view aligns closely with Hall's interpretation that the dissemination of scholarly information depends increasingly on making the research and data produced by scholars openly accessible and '[…] to actively and creatively "doing things" with the research and data that are being continually selected, gathered and made openly accessible'.[147] Interconnectivity and interactivity are aspects that belong to the definition and shape of the book of the future and should therefore be part of the publication process of the book. Publishers can use their expertise, network and brand to achieve this goal and provide, for example, research tools to assist with data mining for researchers.

What are the different steps that publishers can undertake in order to fulfil this function successfully? The highly interconnected web of data of digital books that are adequately stored in a database should be made available in a useful manner in order to provide scholars with effective

[146] Thompson, *Books in the digital age*, pp. 25-26.
[147] Hall, 'The unbound book', p. 499.

linked data that they can analyse for their research projects. The most important goal of data sharing is that the research data can be reused and publishers should invest in data management in order to achieve this.[148] Important steps are saving, sharing and trusting.[149] Saving is based on adequate storing and preserving of data in a format-independent manner that can be reused in the future. Adequate sharing of research data depends on making data accessible, discoverable and citable. For example, Elsevier provides a link to the original dataset in the publication.[150] Lastly, trusting is about making the data comprehensible, reviewed, reproducible, reusable and integrated. Proper metadata is of crucial importance by making the research data comprehensible. The main goal is to offer interconnected data that researchers can use to analyse for further research.

In short, publishers can add value to the books that they publish in various ways. This is based on the different functions that they perform, namely content acquisition and list building, financial investment and risk-taking, content development, quality control, management and coordination, sales and marketing, and providing interconnectivity and interactivity. The digital revolution has an enormous impact on the tasks that publishers accomplish. Copyright, financial models and marketing work differently in the digital age than in the print age. Moreover, it can be stated that their role is changing toward a pro-active attitude by the acquisition of content, a focus on end-users by the development of content, guiding end-users by finding high quality information in a digital environment and the application of knowledge by providing interconnectivity and interactivity. Instead of passively filtering information or waiting for input from authors and scholars, they are actively searching for ways to deliver proper services to the scholarly community in the digital age.

3.4 The cultural and intellectual role of the academic publisher

The digital revolution has a profound impact on the field of academic book publishing and the tasks of the academic publisher. This shift in tasks is not only an extension of their core competencies to a digital environment, but changes the role of the publisher in society significantly. The role of the publisher in society aligns closely with the functions of the publisher that I have described, but takes the line of thinking a step further. Instead of analysing specific functions that publishers can perform, I will focus on their general role in a digital society which is based on similar tendencies that are visible in their various functions that I have discussed. The role of the publisher moves from gatekeeper toward proactively providing services to the academic community. Collaboration with

[148] A. de Waard, H. Cousijn and I.J Aalbersberg, '10 aspects of highly effective research data: Good research data management makes data reusable', *Elsevier connect,* 11 December 2015, < https://www.elsevier.com/connect/10-aspects-of-highly-effective-research-data> (10 June 2016).
[149] Ibid.
[150] Ibid.

libraries, focusing on the experience of the end-users and the application of knowledge becomes very important. I will argue that the cultural and intellectual role of the publisher becomes increasingly important in the digital age. I will focus on the resources that publishers have at their disposal, the external factors of technological inventions and financial struggles, and how this results in opportunities to secure their cultural and intellectual importance.

The positions of the parties in the field of academic book publishing depend on the type and quantity of resources or 'capital' that they have at their disposal.[151] Consequently, the different functions of the academic publisher that I have discussed in the previous paragraph depend on these resources. In order to understand the general role of the publisher in society, I will go more deeply into field theory that Thompson has borrowed from Bourdieu and explain the various types of resources. The capacities to act and get things done depend on the kinds and quantities of resources that the particular party – in this case, the academic book publisher – has at its disposal.[152] In the publishing industry, economic, human, social, intellectual and symbolic resources are the most important. Economic capital is the accumulated financial resources to which publishers have access.[153] This resource determines how much a publisher can invest in new book projects. Human capital is the knowledge, skills and expertise of the staff that is employed at the publishing firm, while social capital is the external network and contacts that the publishing house has built up over time.[154] Intellectual capital consist in the rights that a publisher owns or controls in intellectual content, and that depends on, for example, contracts with authors, which establishes legal entitlements to the content that the publisher is able to exploit.[155] The last important resource of the publisher is their symbolic one. This is the prestige and status of the particular publishing house and is an 'intangible' resource, but might come to expression in the imprint of the publisher that functions as a brand in a highly competitive field.[156] This establishes the function of publishers as '[…] cultural mediators and arbitrators of quality and taste'[157] and strengthens their position in the publishing field. This is very important for publishers, because, in this way, they can attract authors and customers.

It is easy to imagine why some of these resources might be endangered in the digital age, such as the publisher's ownership of intellectual property and their economic capital in an online environment where customers expect information to be accessible for free. Moreover, some of the resources might seem contradictory, such as the economic and symbolic capital. High quality content

[151] Thompson, *Merchants of culture*, p. 4.
[152] Ibid, p. 5.
[153] Ibid, pp. 5-6.
[154] Ibid, p. 6.
[155] Ibid, pp. 6-7.
[156] Ibid, p. 8.
[157] Ibid.

that establishes the brand of publishers does not automatically lead to high profit in terms of financial income. Thompson explains that both criteria are important for all publishers, but the significance assigned to one criterion over the other might vary among editors, imprints and publishing houses.[158] Even in the field of academic book publishing, there is a variety of publishing houses, some more focused on 'academic-trade' titles and some are able to focus more exclusively on scholarly books in narrow fields meant for a specialised market. This is, for example, possible with the help of funding from universities, but is becoming increasingly difficult, because of the declining sales of the monograph.

Schiffrin analyses the economic position of publishers in the broader context of modern capitalist society, which puts publishers in the position of investors and bankers.[159] In his interpretation, the modern capitalistic trends in society open up possibilities for especially university presses to look more deeply into their intellectual and cultural role, because many other large publishing or media companies are cutting down severely on their intellectual output.[160] This is because of the pressure to make maximum profit and many commercial publishing houses invest, therefore, mainly in books which will lead to the highest profit, such as bestsellers.[161] Academic publishers should find a balance between economic and academic or cultural reasons to invest in the acquisition, development and production of a book. In these uncertain times, large publishing companies focus mainly on making maximum profit, which gives academic publishers the opportunity to ensure their cultural and intellectual role in society. For example, they can chose to not only invest in very specialised scholarly monographs, but in 'academic-trade' titles that are of intellectual quality and still interesting to the more general public as well. This aligns with the earlier mentioned trend of university presses to shift partly to commercial publishing. In this way, academic publishers are relevant to the scholarly community as well as directly to society at large.

In my view, the changing field of academic book publishing opens up possibilities for the academic publisher to secure their cultural and intellectual role in society. Schiffrin defended this standpoint by discussing economic forces in society and I will shed a light on the role of the publisher from the viewpoint of the digital revolution. Academic publishers are no longer the traditional gatekeepers of information who automatically own or control the intellectual rights and exploit the profit without having to think much about the end-users of their products. Does this mean that the role of the publisher is only minimal in the digital age? They are challenged to make their services relevant to authors and readers, while struggling through changes in their financial models and technological inventions that pushes them to invest in a digital infrastructure. The digital revolution

[158] Ibid, p. 10.
[159] A. Schiffrin, *Words and money* (London and New York: Verso, 2010), pp. 2-5.
[160] Ibid, p. 16.
[161] Ibid, p. 17.

can be considered a driving force for publishers, because new technologies 'pull' them to publish and disseminate their books digitally.[162] Another factor that impacts scholarly publishing is the process of institutional restructuring in academia.[163] Digital books are considerably different in terms of dissemination and storage than printed books, which cause libraries to change their delivery and repository strategies. Does the tension between cultural and economic motivations, technological inventions and the changing positions of the other parties of the field of academic book publishing leave much room for academic publishers to cultivate their intellectual role in society?

The fundamental and ontological transition from print to digital publishing systems encourages publishers to engage with the paradigm shift in society. The role of the publisher shifts from traditional gatekeeper to proactively providing services to the academic community. In order to survive, they must show the relevance of their services and adapt to the digital society. This creates, however, a great opportunity for publishers to prove their value. As I have explained with help of Gadamer's view on prejudices, it is important for publishers to have a strong awareness of the ways in which we are embedded in history and culture regarding writing, publishing and reading printed books. The habits of reading, navigating, browsing and zooming in the print era influences the way readers interact with digital books. Publishers have an understanding of the 'logic of the field' and if they combine this practical knowledge with research into the behaviour of users in a digital environment, they can apply their expertise to explore digital ways of scholarly transmission of knowledge. The successful navigation of the digital landscape is based on awareness of the conventions, values and reader habits regarding the various types of printed academic books, such as monographs and technical handbooks, across the different disciplines, such as the humanities and the sciences. Publishers have a unique set of resources to make the best out of our current hybrid landscape, where print and digital books exist next to each other. Their motivation to earn status in their publishing field by providing content of a high cultural and intellectual value combined with their need to make enough money to be able to remain in business results in an ideal position for publishers where they can invest in end-products that are useful for readers.

The relevance for end-users is based on knowledge of and insight into the new digital system. In the last section, I have placed emphasis on the functions of the academic publisher regarding proactively creating content, the application of knowledge, making their production processes user-central and providing interconnectivity and interactivity. They have to engage in the paradigm shift from print to digital in society. This is an important cultural and intellectual role, because, as I have discussed, the digitisation of society causes changes in thinking, writing and reading of books. The creation and consumption of scholarly knowledge is changing. Books might become networked

[162] Borgman, *Scholarship in the digital age*, pp. 76-77.
[163] Ibid, p. 78.

objects and, if published online, more a stage in the ongoing creation of knowledge than the end-product and can be constantly commented on by readers. This means that the concept of knowledge itself might change and the relationship between author and reader is changing profoundly. How can publishers engage with these changes? In my interpretation, this is possible by doing experiments with and research about digital books. This view aligns with Stewart's, Procter's, William's and Poschen's interpretation, because they suggest that '[…] academic publishers may play an ongoing role as innovation intermediaries through their access to a unique set of resources to shape innovation and use, providing the scholarly community with opportunities to use and learn about Web 2.0'.[164]

In my view, this does not mean that publishers will have the authority to force the scholarly community to publish and read their books digitally, because it is especially the authoritative position of gatekeeper that vanishes in the digital age. As Pochoda states, the traditional hierarchical systems of authority in academia are being replaced by the active and interactive involvement of diverse scholarly communities.[165] Academic publishers are facing the challenge to make their services relevant by thinking critically about the shift from print to digital and use their expertise and insight to explore new digital possibilities for book publishing. This means that they do not follow the technological inventions blindly and let, for example, the data 'speak for themselves' in the case of data mining of user behaviour, but they approach the digitisation from a critical viewpoint in which they take the perspective of the end-user into account.

The exploration of new digital possibilities should be based on the features of printed and digital books that we know today and are valued by readers. As I have argued, wildly speculating about an unknown born-digital future is not very useful, because we cannot look beyond the horizon of our history and culture. Instead, the experimentations of publishers can focus on the continuum ranging from digital books that resemble the print heritage as closely as possible to born-digital books. The hybrid reading landscape encourages publishers to explore combinations of print and digital elements. Printed monographs are experienced by readers as suitable for long-term reading and easy browsing and navigating, while digital media offer possibilities for directly commenting on books, full-text search and connecting the books in a non-linear way in the database on which digital research tools can be applied. Publishers should be aware of these features and possibilities of printed and digital book and, for example, invest in both printed editions and digital possibilities. The digital revolution challenges publishers to look beyond the situation in which they publish printed books next to digital editions in PDF format that resemble the printed book as closely as possible, so

[164] Stewart, Procter, Williams and Poschen, 'The role of academic publishers in shaping the development of Web 2.0 services for scholarly communication', p. 414.
[165] Pochoda, 'The big one', p. 372.

that the digital possibilities are not really used. End-users can search in the full text of the PDF edition, but otherwise, they do not have much motivation to use the digital book instead of the printed version.

Publishers can, for example, use the print-on-demand publishing model for printed books and further invest in interactive books online that offers possibilities for commenting and doing research in a non-linear fashion. They can develop databases in which e-books – alongside other digital media – are adequately stored with proper metadata. Moreover, both publishers and scholars should invest in doing research in new ways of integrating form and content in a digital environment. Digital platforms and interfaces should be user-friendly and make use of the possibilities that the electronic age offers. The expertise of publishers can help by discovering how content and form are entangled and in which ways the form influences the consumption of the content. This does also mean that publishers might think creatively and pay attention to new developments in the scholarly community about new forms of referring to specific locations in the text and the use of the index. The answers to the great questions about digital books might be different for various types of books and the different disciplines in academia. This can lead to the blurring of the different types of academic books as we know them today and between books and other types of scholarly communication, such as journal articles.

In short, academic publishers might occupy an important cultural and intellectual role in the digital age. They should think critically about the transition from print to digital and pay attention to new developments in this field. Experiments with publishing digitally, combining both print and digital elements and the experience and behaviour of users in a digital environment is very important for their intellectual role in society. This role is based on their unique set of resources, such as their human, social, economic and symbolic capital. Publishing houses attempt to gain optimal prestige in their field by means of branding, they need to earn enough profit to be able to stay in business and have the expertise and knowledge of staff members and their external network. This leads to a situation in which they have to make themselves relevant to both authors and readers and provide their services to the academic community.

3.5: Conclusion

In this chapter, I have explored the role of the academic publisher in the digital age. The digital revolution changes the workflows of the publisher as well as his relationship with other parties in the field of academic book publishing. Publishers should continue to make themselves actively relevant to the scholarly community instead of taking their role for granted. The collaboration between publishing firms and libraries might be very important in the digital age. Moreover, publishers are pressured to actively concern themselves with the experience of end-users for the first time in

history. They have to take advantage of the digital possibilities in order to make the online platforms, databases and interfaces attractive for users. Data tracking might be important for getting insight into user behaviour and improve reader experience, but publishers should think critically about what they would like to accomplish with the data and what the impact might be on the encouragement of critical thinking instead of blindly following the technological inventions and possibilities.

Furthermore, the digitisation of society has an impact on the various functions of the academic publisher. Publishers act more proactively by the acquisition of content, they focus on end-users by the development of content, they guide end-users by finding high quality information in a digital environment and they pay attention to the application of knowledge by providing interconnectivity and interactivity. The general role of academic publishers in society is shifting from gatekeepers to providing services to the scholarly community. This creates a possibility for publishers to ensure their intellectual and cultural role by doing research and experiments with digital publishing in our hybrid reading culture.

IV. Conclusion

This thesis has explored the ontological changes of the scholarly book in a digital environment, which establishes the book as living part of the life cycle instead of 'a dead thing' that carries preformed information. The book as living system is changing significantly in the digital age, where books become immaterial and 'networked objects' in the database. This has a profound impact on the workflows and role of the academic publisher, who becomes more focused on the experiences and wishes of end-users and who has to make his services relevant in a changing society where their position is no longer self-evident. In the conclusion, I will summarise my findings and open the debate fur further discussion and research.

4.1: Summary

Academic books are slower to adapt to a digital environment than scholarly journals, because of the specific conventions that surround printed books. Many scholarly books are meant to be consumed in long-form and scholars are used to navigate them by specific browsing, searching and zooming. This is especially true for the monograph that is also an important career vehicle in the humanities. Consequently, we still live in a hybrid reading culture where printed and digital books are consumed next to each other. Moreover, many digital books resemble the printed editions as closely as possible, such as is the case with images of printed pages in PDF format. This results in a continuum ranging from digital books that resemble the printed heritage as closely as possible to digitally published long-form scholarship that is not suitable for print publication. How can publishers and researchers in the field of book and publishing studies anticipate on an unknown born-digital future? Our research and reading practices are embedded in history and culture and it is not very useful to wildly speculate about an unknown future. Instead, publishers can use their knowledge and experience from the past to analyse the current situation, while at the same time acknowledging that our hybrid reading culture might be temporary.

Different types of scholarly books that are published across various academic disciplines are in various degrees suitable for digital publication. Books that require constant updating, such as handbooks in computer science, thrive well in a digital environment. New digital options for indexing are slowly opening up and might also benefit digital dissemination of textbooks and monographs. Moreover, books are not only produced in a social system, but they change the system as well. Hence, digital possibilities, such as cross-references, constant updating and shorter amounts of texts, might become increasingly important for future scholarship. The boundaries of academic books are stretching in a digital environment. Digital books are no longer dependent on a physical container,

which disrupts the notion of the book as we know it and opens up new possibilities for connecting form and content. Metadata determines the discoverability of books in a digital environment, which means that they become increasingly important and that discoverability becomes part of the architecture of the book itself. Interconnectivity between books that are stored in the database and interactivity between readers and authors are significant features of digital media. Books are no longer isolated material objects, but have the potential to become 'networked objects' in a digital environment. The design of books regarding index and table of contents changes online as well and might be replaced by full text search. Moreover, instead of flipping through the book, readers make often use of hyperlinks if they are provided. Digital reading is fundamentally different for end-users than reading printed books.

The hybrid reading culture and new digital possibilities that are being developed fast leave a challenging task for academic publishers to navigate this landscape successfully. The digital revolution has an impact on the workflows of the publisher as well as his relationship with other parties in the field of academic book publishing. The collaboration between publishers and libraries becomes increasingly important and publishers are challenged to continue to make their services relevant to the scholarly community instead of taken their role for granted. The relationship between publishers and end-users needs special attention as well in the digital age. For the first time in history, academic publishers have to really concern themselves with the end-users of the book that they publish. Readers interact in a different way with digital than printed books, which challenges publishers to explore new ways of integrating form and content in a digital environment. Data tracking of user behaviour is an important way to get insight into the behaviour of users and to personalise the digital interfaces. It is, however, crucial for publishers to keep in mind what they are looking for and not just let the data 'speak for itself'. Insight into end-users can be used to gain knowledge about digital reading behaviours, which helps publishers by enabling them to conduct experiments with digital publications and interfaces.

Academic publishers add value to books in several ways: content acquisition and list building, financial investment and risk-taking, content development, quality control, management and coordination, sales and marketing, and providing interconnectivity and interactivity. In the digital age, the role of publishers is moving toward a proactive attitude by the acquisition of content, a focus on end-users by the development of content and by helping end-users with finding high quality information in a digital environment and the application of knowledge by providing interactivity and research tools for data analysis. Publishers do not only have to include digital skills in their core competencies, but they see their role in society changing. They are challenged to make their services actively relevant to the scholarly community. An important way for publishers to claim this role is by ensuring their cultural and intellectual role in a digital society. The transition from print to digital has

a fundamental impact on the shape of the academic book, readership and authorship. It is important that publishers reflect critically on these developments and not blindly follow the latest technology. They can use their knowledge and expertise in their field to do research about and experiment with digital publishing. This research can, for example, be about the connection between form and content in a digital environment, digital reading and new forms of transmission of scholarly knowledge that surpasses the types of academic books and the differences between books and journal articles that are known in the print era.

4.2: Discussion

This thesis has aimed to develop a theoretical framework in which the many challenges that are associated with the transition from print to digital can be understood. The changing features of the scholarly book in a digital environment have a profound impact on the tasks of the academic publisher, his relationship with various parties, such as authors and readers, and his role in society. If publishers have a clearer and more positive understanding of their own role in a rapidly changing society, they will be better equipped to navigate this complex and digital world. Their traditional role as gatekeepers is slowly fading, but this does not mean that there is no place for publishers in our future society. It might seem easy for publishers to just follow the latest digital developments out of fear that they are left behind, but critically reflecting on the impact of digital possibilities on the quality of the content of publications and the way of thinking and doing research, and the experiences and wishes of authors and readers should be part of the intellectual role of the publisher. By ensuring their intellectual role, publishers are better aware of the purpose of their publications and they can make more informed choices about whether to publish a specific book in print or digital edition or a combination of both.

How this framework can be further developed remains, of course, open for further research. The digital revolution has a different impact on various types of academic books and scholarly disciplines. Further research might, for example, focus on what kinds of digital developments, research and experiments are needed in different places, such as the humanities and the sciences. The way in which publishers can provide interactivity and interconnectivity might be different for various types of publications as well and is an excellent topic for further research. Moreover, many topics in this thesis have only been discussed shortly, such as the role of peer review and indexing in a digital environment and the changing financial models. All these topics deserve their own research project. The completely born-digital future is unknown, but that does not mean that publishers cannot use their knowledge, expertise and unique set of resources to thrive in a digital environment and be prepared for the challenges of the future by understanding the relevance of their role in society.

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