Turbulence in the higher education publishing industry due to open access. A PESTEL analysis.

Author: Mirte Versloot
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT: This paper explores the turbulence in the higher education publishing industry due to open access (OA) publishing by using the PESTEL model. The PESTEL model is chosen to gain insights in the changes in this industry. The political- and legal dimension pressure the industry to adopt OA by implementing laws. The economic dimension influences the adoption of OA due to different business models. The social dimension is adopting and resisting OA. Lastly technology enabled the industry to establish OA due to the internet. Next to this, the results of the research show that economic- social- and legal uncertainties are restraining the adoption of OA in higher education publishing industry. In the near future the focus of the higher education publishing industry should be on developing OA business models and agreements on copyright standards to ensure the further adoption of OA.

Supervisors: T. De Schryver
              K. Zalewska-Kurek

Keywords
Open access publishing, PESTEL, scenario analysis.

1. INTRODUCTION

OA publishing is a phenomenon which has established itself in the higher education publishing industry over the last years (Harnad, 2015; Bull & Atchison, 2015). Although the new OA model has emerged, the existing subscription based model is still dominant. This subscription based model relies on extremely high prices (Dekker, 2016). The growth of the OA model therefore impacts on the vested interest of parts of the industry, among which scientists (Springer, 2016; Djurkovic, 2014). OA is defined in the literature as; 'online, free of charge, and free of most copyright and licensing restrictions'. (Suber, 2004). Next to this there are different OA publishing models as gold- green- and hybrid OA publishing models (Shen & Björk, 2015; Guardon, 2004). The Gold OA model is defined as a model which expects authors to pay for their articles when published (Quinn, 2015; Shen & Björk, 2015). Green OA means that authors post copies of their article to OA websites (Björk, Roos, & Lauri, 2009; Shen & Björk, 2015). These OA websites are different from e-journals as e-journals do not necessarily have to publish open access but OA websites do (Qasim & Khan, 2015). Hybrid OA makes use of both these above mentioned models at the same journal (Besancenot & Vranceanu, 2016). This leads to double-dipping in which publishers make money by using both the models (Sweeney, 2014). Publishers partly embrace OA since additional revenues can be made by adopting OA (Ware & Mave, 2015; Eger, Scheufen & Meierrieks, 2015). Next to this, part of the industry embraces OA because of resistance against the subscription based model. The high prices of the subscription based model and the idea that government funded research is only available when paid for, goes against the believes of society (KNAW, 2016; Djurkovic, 2014). In addition, OA is resisted by part of the industry since publisher's revenue streams are still rising (Bulock, Hosburgh, & Mann, 2015).

These changes in the higher education publishing industry due to OA result in a dynamic, complex and uncertain environment, in which there are a lot of uncertainties about the development of OA publishing. (Laakso, Welling, Bukvova, Nyman, Bjork, & Hedlund, 2011). Part of the industry moves towards OA journals and freely available articles on the web (Björk et al., 2010). Moreover, OA establishes itself in the industry because of political and legal pressures to adopt OA (Calmthout, 2015; Watkinson, et al., 2016; Gumport, 2000).

The objective of this paper is to answer the following question: 'How does the PESTEL model explain the development of OA in the higher education publishing industry?' To answer the question, the PESTEL model is applied, because this model can sort out the effects of multiple dimensions influencing an industry (Greenwoord, Diaz, Xiao Li, & Cespedes Lorente, 2010). Several other studies use the PESTEL model to provide structure to a changing environment, and identify the drivers behind the change (Walsh, 2005; Kremer & Symmons, 2015; Shilei & Yong, 2009; Ignacio, Fernandez, Cala & Domecq, 2011). Hence it is interesting to see whether the PESTEL model can sort out the effects of the multiple dimensions influencing OA publishing. And next to this, how theses dimensions cause uncertainty for the development of OA in the future.

This research is relevant for the higher education publishing industry. First of all, using the PESTEL analysis will gain insights in the development of OA. Next to this, this research can identify the uncertainties for the future developments of OA. This research and its findings serve as a starting point for the industry to identify alternative strategic options due to OA. Predictions can be made about which alternatives paths should be considered due to trends in OA publishing.

2. THEORETICAL FRAMEWORK

The PESTEL framework consists of broad environmental factors that impact organizations (Johnson, Whittington, & Scholes, 2011). This framework categorizes external influences into six main dimensions: political-, economic-, social-, technological-, environmental- and legal influences (Kremer & Symmons, 2015; Walsh, 2005; Ignacio, Fernandez, Cala & Domecq, 2011; Shilei & Yong, 2009). Analysing how these dimensions are changing is important to draw conclusions on changes and future trends occurring in an industry because these changes might have strategic implications for companies within the industry (Walsh, 2005; Ignacio, Fernandez, Cala & Domecq, 2011; Johnson, Scholes & Whittington, 2005).

No complete PESTEL analysis has been done for the Higher education publishing industry. Research in literature only gave partial ideas about which factors might be important in a PESTEL analysis for the Higher education publishing industry. Ware & Mave (2015); Rojers (2010); McGuigan & Russel (2008); Galin & Latchaw, (2010); Björk, & Solomon (2012); Björk, Laakso, Welling, & Paetau (2014) mention several factors which are stated below.

• Political factors: government decisions made in the Higher education publishing industry.

• Economic factors: green- and gold-business models, self-archiving, Article processing charge (APC), costs of scholary communication, page charges and subscription fees.

• Social factors: disagreements on subscription fees, disagreements on business models, trends on reading behaviour and author attitudes and behaviour

• Technological factors: technical solutions for plagiarism could be a sub-factor.

• Environmental factors: No information available on this topic.

• Legal factors: copyright & licences restrictions, mandates for OA, IP law, CC BY and re-use rights.

Since many PESTEL dimensions influence each other, key drivers for change need to be identified to create structure. These key drivers for change are the factors likely to have a high impact on the success or failure of a strategy and thus relevant (Johnson, Whittington, & Scholes, 2011). Identifying key drivers for change helps to focus on the PESTEL factors that are most relevant (Johnson, Whittington, & Scholes, 2011). These key drivers of change can be a combination of different PESTEL dimensions clustered together.

The detailed application of the PESTEL model is not used frequently since the factors which are analyzed in PESTEL, are usually dynamic and changing constantly which makes, keeping up with the industries changes, difficult (Postma & Lieb, 2005; Swayne, Duncan & Ginter, 2008). When a business environment is highly uncertain because of complexity or rapid changes in the industry, forecasting how these PESTEL influences will affect the industry is not meaningful (Johnson, Whittington, & Scholes, 2011). Instead it is important to indentify some scenarios that can be monitored (Walsh, 2005; Johnson, Whittington & Scholes, 2011). Scenarios are plausible views of how the business environment of an organisation might develop in the future based on groupings of key drivers for change about which there is a high level of uncertainty (Johnson, Whittington, & Scholes, 2011).

According to Postma & Lieb, 2003, to sketch a scenario, it is most valuable to choose drivers which are highly uncertain and highly relevant because the uncertainties and relevance give

better insights in changes that might happen but were not considered. Highly uncertain means that it is not clear how the driver is going to change since there are more ways in which the uncertainty can develop itself over time (Vecchiato & Rovenda, 2010). According to Vecchiato and Rovenda (2010) uncertainty can be split up in three different ones; State-, effect-, and response uncertainty. State uncertainty is how components in the environment might change. The effect the uncertainty has on the organization or industry is called effect uncertainty. Response uncertainty deals with viable response towards the uncertainty. State uncertainty is most commonly looked at. However for the strategic survival of companies in a fast changing industry it is vital to also try to identify the effect- and response uncertainty (Vecchiato & Rovenda, 2010).

Purpose of the scenarios is not to predict the future but merely to sketch scenarios based on uncertainties which could be monitored in the future.

This theoretical framework was applied on the higher education publishing industry to give an answer on the main research question. To answer the research question, the following sub-questions will be answered. Which of the PESTEL dimensions play a role in the higher education publishing industry?; Which of these dimensions is uncertain?; How do these uncertainties influence OA?

3. METHOD

The information obtained for this research is based on secondary sources, specifically full text trade journals. Secondary sources were chosen rather than experts since the secondary sources can give more reliable information about the past, this data is without a recall bias (Chi, 2006). These trade journals were gathered from the LISTA database on the EBSCOHOST platform. The LISTA database was selected for retrieving articles because EBSCOHOST is a leading provider in e-resources and LISTA in particularly covers a wide range of subjects including librarianship, information management and online information retrieval (Kumar, 2014). Since the database contains 700 journals, books and reports within the librarianship and information sciences field, it is a representative database for the research question which investigates this specific field. The database continuously produces new trade journals and specific kinds of journals, dates, languages can be selected when using a search term which makes selection of data easy.

Based on the LISTA database, a systematic literature review of trade publications was done to answer the main research question. Articles in trade journals were chosen as a source since these trade journals display a lot of information and are meant to keep the higher education publishing industry up to date. Also these journals will provide this research with latest opinions and changes in the industry and there are many available.

The search term 'OA publishing' was used since the definition OA publishing covers more specific the higher education publishing industry whereas OA covers a wider range of industries, were industries as the medicine industry is also included (Mahajan, Barthel, & Marshall, 1996). A citation from Mahajan, Barthel & Marshall (1996) to illustrate a definition for OA when search for OA instead of OA publishing: 'Open-access endoscopy allows nongastroenterologist physicians the opportunity to directly schedule elective common endoscopic procedures for their patients without having them first examined in the gastrointestinal clinic'. Since this definition of OA is of no use for this research, OA publishing is chosen. This resulted in 249 trade journals starting from 2003 until 2016.

Moreover only English written articles were selected. This resulted in a list of 214 trade journals.

I reviewed the 214 selected articles as follows. To find an answer for the first sub-question , I made a summary of every article. Then I determined which dimension of the PESTEL model was mentioned in the summary of the article. If an article was classified in one of the PESTEL dimensions, I put the information in the literature matrix. Next to this, I determined what role this PESTEL dimension played in the turbulence of the Higher education publishing industry. I also searched for connections between this PESTEL dimension and other PESTEL dimensions in the article because this could possibly show trends in the development of OA publishing. I included the year of the article in the matrix since the PESTEL model was applied to a dynamic and fast changing environment (Postma & Lieb, 2005). It could be interesting to see whether certain dimensions of the PESTEL model gained earlier attention and have created momentum for other PESTTEL dimensions in OA publishing. Based on the results from the matrix, the second sub-question was answered. The uncertainty was identified by scanning dimensions in the higher education publishing industry for which there is no set future and multiple developments are possible. To answer the third sub question, I clustered the uncertainties to identify the most pressing uncertainties for OA publishing. I clustered the uncertainties by looking at relationships between uncertainties. If for example there would be a political and legal uncertainty which would be related towards each other and influence each other, these two uncertainties are clustered since one of the dimensions has a direct impact on the other dimension. I used these clustered uncertainties as a starting point to identify how these uncertainties could possibly influence the future of OA publishing for the next five years.
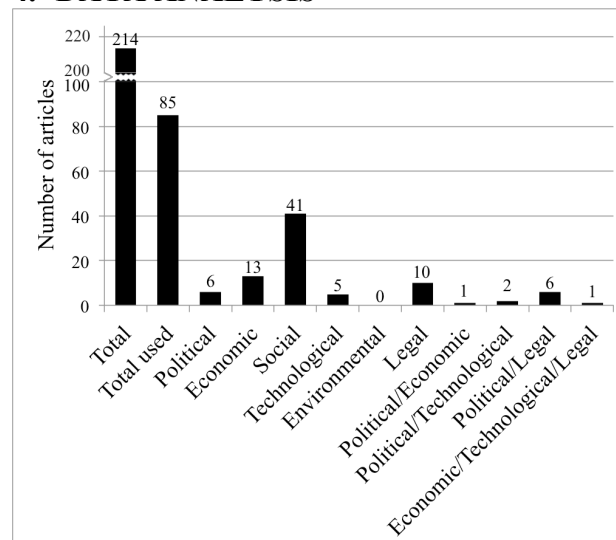
4. DATA ANALYSIS

Figure 1. Distribution of PESTEL dimensions in articles

In this data analysis, the five dimensions of the PESTEL model influencing the higher education publishing industry will be explained. Also this section will explain the possible links among the PESTEL model. Next to this, these dimensions will be scored on uncertainty. In 4.1 and 4.2 these uncertainties will be used to explain the future turbulence for OA.

From the 85 articles which were included in the matrix, 6 articles were defined as the political dimension, 10 articles were defined as economic, 41 articles discussed the social dimension of OA, 6 articles were technological and 10 articles discussed the legal PESTEL dimension. Moreover 6 articles discussed the political- and legal dimension, 2 articles discussed the political- and technological dimension, 1 article discussed the political- and economic dimension and lastly 1 article discussed the economic-, technological- and legal dimension.
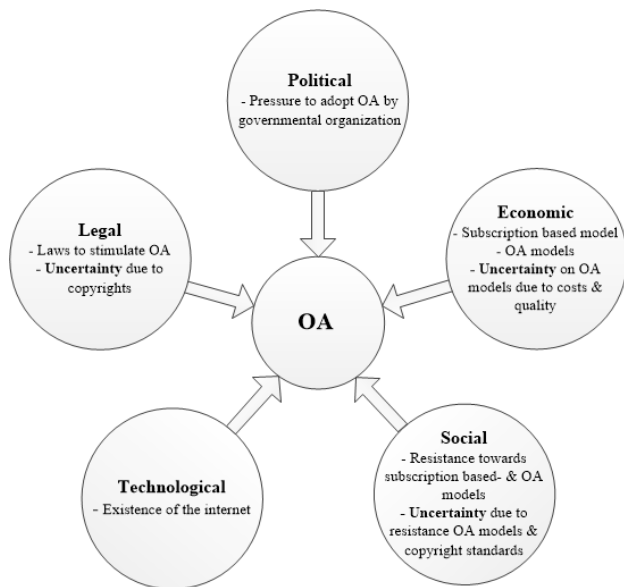
Figure 2. PESTEL factors and uncertainty

4.1 Political
The main finding for the political dimension is the political pressure and support on adoption of OA by the congress, government and presidents (Quint & Hane, 2008; Kaser, 2008; Pike, 2009; Peek, Reports on Access to Research, 2011; Schwartz, 2013; Kaufman, 2013; Chant, 2014; Peet, 2014).

In 2004, the government should take a leading role in the development of OA. According to Albanese, UK Report Calls for Publicly Available STM Research (2004) *'The report recommends that UK institutions 'establish institutional repositories on which their published output can be read free-of-charge online' and that the government appoint "a central body" to oversee implementation'.* The articles published in 2006 and 2007 repeat this statement by reporting that there is political momentum and pressure to publish OA in Europe, UK and US (Information Today., 2006; Peek, The Battles of OA ., 2006; Peek, Stickers, a Pit Bull, and Brussels: A Busy Month for OA., 2007). These pressures are intended to ensure that OA publishing will be implemented in the higher education publishing industry. From 2008 until 2014 there are several bills which are signed into laws to pressure governmental funded organizations to publish OA (Quint & Hane, 2008; Kaser, 2008; Pike, 2009; Peek, Reports on Access to Research, 2011; Schwartz, 2013; Kaufman, 2013; Chant, 2014; Peet, 2014).

Schwartz, (2013): *' The House of Representatives and the Senate passed an omnibus spending bill that contained a language requiring the National Institutes of Health (NIH) to adopt an OA (OA) mandate. President Bush signed it into law just before the end of the year.'* These policies do not only result in compliance by the governmental organizations that are pressured to comply. Other organizations use this as an example to implement the OA policies as well while they are not obligated to implement those (Enis, 2013). In 2008 and 2009 there were two articles that reported some objections towards OA by the White House and congress (Peek, The OA drama of it all., 2008; Pike, 2009). The White House softly objected a bill that stated that the National institute of Health (NIH) should make all their research OA. There was objection because the research needed to be made available immediately after publication. The White House believed it to be unfair for publishers since this would undermine their revenue stream. This part of the bills was adapted and allowed publishers to make the articles available within one year after publication. The bill was then signed into law by President Bush later that year (Quint & Hane, 2008). The other debate in congress was about legal issues concerning OA and the uncertainty of how these legal rules should be shaped (Pike, 2009). In 2008, when the first bill was signed into law and congress softly objected a bill, there was more attention towards the political and legal dimensions of the PESTEL model. I found that almost half of the articles published in these years wrote about the political dimension.

I found, that the political dimensions has build up momentum over time since the political attention resulted in actions from the government to actively stimulate the adoption of OA with the use of laws. The government does not only want the higher education publishing industry to adopt OA. The government also wants to develop a framework in which the adoption of OA should take place. The political aspect of the PESTEL analysis can be identified as highly relevant since there are pressures from this dimension to establish OA in the higher education publishing industry. These findings show that it is very likely that the trend to politically pressure the OA industry to adopt OA will remain in the upcoming years. On the contrary, there is little uncertainty about whether the political dimension will keep pressuring the industry to adopt OA.

4.2 Economic
The economic dimension is dominated by the prices of the old subscription based model, the prices of the OA models and the different OA business models. The inflated prices of the subscription based model are the reason why OA was introduced and adopted by the industry (Crawford, 2005; Kaser, 2007; Peek, Stickers, a Pit Bull, and Brussels: A Busy Month OA., 2007; Schwartz, McGuire & Warhurton, 2013; Bosch & Henderson, The winds of change., 2013).

Schwartz, McGuire & Warhurton (2013) report that organizations launched OA since they can no longer afford to pay for the prices journals ask. According to Kaser, (2007) *'Instead of prices decreasing over the last few decades, they have risen may-fold, which defies economic laws'.* All the articles reporting on the prices of the subscription based model agree that the prices for journals were too high which resulted in OA. However there is also a discussion whether OA prices are more expensive or cheaper than the subscription based model. (Albanese, Report: OA Cheaper 2004; Albanese, Cornell: Open Access Costly, 2005; LaGuida, 2005; Ashling, 2009; Schwartz, McGuire & Warhurton, 2013 Enis, 2015). From 2004 and 2005 there are mixed signals about the prices of OA compared to the old subscription based model. Articles which were published after 2008 report that OA will save money. According to Ashling (2009) the change from the subscription based model towards the gold OA model will save 80 million per year for the UK. Moreover going from the subscription based model towards the green OA model will

save 116 million per year. However Albanese, Cornell: Open Access Costly (2005) explains that OA publishing cost more per article published.

Next to this, there are concerns about the shifts in costs. The costs which were previously paid by the reader are now shifted towards the authors. LaGuida (2005) *'OA recognizes the real costs associated with publishing but shifts the burden…. from publishers to authors'* (LaGuardia, 2005). The shifting costs due to changes in the business models are not appreciated by the entire industry. Next to this, Enis (2015) explains that OA only increases the revenue streams of publishers since they can make use of double-dipping.

Next to the struggles with prices of the OA business models, there are more uncertainties about the different OA business models. The green- gold and hybrid models were mentioned by several authors. However the industry has not developed OA business models that seem to suit part of the industry. The industry acknowledges that publication costs need to be paid (Oder, Blumenstein, & Hadro, OPEN ACCESS FUNDING BOOST., 2009). But whether the costs should be paid by the author is not agreed upon by the industry (LaGuardia, 2005). Moreover the quality guarantee of the articles in the current OA business models is questioned (Ojala, 2005; Quint, 2006). Also all the OA business models are implemented differently by publishers. This results in struggles about knowing how to publish the articles correctly (Hawkins, 2005). Therefore most of the articles discuss the development of a new OA business model (Hawkins, 2005; Peek, Stickers, a Pit Bull, and Brussels: A Busy Month for OA., 2007; Oder, Blumenstein & Hadro, Open access funding boost.,2009; Oder et al., 2010; Bosch & Henderson, The winds of change., 2013; Hodgsons, 2014).

According to Bosch & Henderson, The winds of change (2013); Hawkins (2005); Oder et al. (2010) and Hodgsons (2014), the current OA business models do not solve the problems of the subscription based model as the prices and costs related to publishing articles OA are seen as equally expensive. These authors believe that there should be a new OA business model introduced in the industry. However none of the writers explain what the model should look like. According to Hawkins (2005) *'Author fees are currently dominating the OA discussion, but this restricts the issues to fields where large grants are normal. OA has wider applications than the author-pays model; the current debate must include the entire field'*.

I found that the OA business models are not set since there are struggles with all of the current models. The industry is curious about another OA business model which can solve some of the OA struggles. I also found that the economic dimensions is linked towards the social dimension. The resistance towards the high inflated subscription fees result in the adoption of OA. However the struggles with the OA business models and the financial sustainability cause resistance against OA. Next to this, there are uncertainties for the economic dimension since there is no OA business model which everyone agrees upon. Several articles opt to create a new OA business model. How the OA business models are shaped and establish itself in the industry is uncertain. Next to this there is also uncertainty about the pricing of the OA business models.

4.3 Social
The social dimension was most often addressed in the articles. The main findings are the adoption of OA, resistance of OA or the resistance against the old business model (Hane, 2003; Poynder, 2005; Van Orsdel & Born, 2005; Ojala, 2005; Boetcher, 2006; Ashling, Opening the Door to Public Access to

Publicly Funded Research, 2007; Crawford 2008; Peek, The tide has changed, Get over it., 2009; Berry, 2010; Kennedy, 2012; Clobridge, 2013; Peet, Academic: Open Humanities Library Progresses., 2014; Anderson, 2015).

Most of the articles do not explain why the resistance or adoption of OA occurs. The articles only reported that the resistance or adoption exists. The adoption of OA, when explained, is caused by the high prices for subscription fees (Ojala, 2005; Boetcher, 2006; Drake, 2007; Asling, 2007; Peet, Academic: Open Humanities Library Progresses., 2014). The adoption of OA also results in struggles. There is too little government funding available to make OA establish itself in the publishing business (Van Orsdel & Born, 2005). Also OA cannot guaranty the quality standards of the articles (Ojala, 2005; Quint, 2006). The resistance for OA comes partly from publishers, since OA will harm their revenue streams (Orsdel & Born, 2007; Albanese, Open Access: ARL vs. Publishers., 2007; Crawford, 2005).

Crawford (2005) states *'OA also threatens existing business models. Some publishers make money selling copies of already-published articles. Other journal publishers fear that if refereed articles are available for free, many libraries will cancel subscriptions, driving them out of business'*. Also there is resistance on OA because OA might require a mandate system (Peet, Academic: Open Humanities Library Progresses., 2014). In addition, OA is resisted since the movement does not relieve the price pressures in the industry (Bosch & Henderson, WHOLE LOTTA SHAKIN' GOIN' ON., 2015; Anderson, 2015). According to Bosch & Henderson, WHOLE LOTTA SHAKIN' GOIN' ON, 2015 *' OA may no longer be the disruptive force on commercial publishing for which many had hoped.'*

I found, that the social dimension of the higher education publishing industry is not set and prone to change. OA is adopted but also resisted. The struggles result in uncertainty for the social dimension. In addition, I found, that several of the social articles are linked towards the legal dimension. An article discusses the need for new standards and laws if OA is adopted (Peek, With growth comes growing pains., 2008). Next to this, articles discuss authors, who would like to adopt OA but legal requirements as CC BY copyrights concern them (Anderson, 2015; Peet, Academic: Open Humanities Library Progresses., 2014). Lastly legal mandates are implemented to ensure the adoption of OA (Peek, Harvard Faculty Mandate OA., 2008; Oder, Albanese & Lau-Whelan, 2009).

The social aspect of the PESTEL analysis causes pressures in the industry due to the adoption or resistance towards OA. People adopt OA because of dissatisfaction for the high prices in the subscription based model. The resistance of OA is caused by struggles with the implementation of OA as loss of revenue, copyright rules and costs for publishing. Next to that, the social dimension is uncertain since the struggles with OA cause resistance. As there are doubts about OA, it is not clear how the adoption and resistance will develop itself. I found that the adoption and resistance of OA is based on the changes occurring in other dimensions as the legal- and economical dimension. The development of the economic- and legal dimension influences the social dimension.

4.4 Technological
The technological dimension expresses that the internet made OA possible (Hogan, 2004; Drake, 2007; Ojala, FRONT Lines. Dynamic Disruption., 2015; Ratner & Meadows, 2014). According to Hogan (2004*) 'David Worlock, chairman of*

Electronic Publishing Services, Ltd believes that changes in communication habits and patterns, particularly the pervasive use of the Internet by scholars and researchers, were more likely the cause of many OA initiatives'. Next to this, one article states that the infrastructure surrounding OA and the development of software and systems are not up to date for OA publishing (Hodgson, 2014). Ratner & Meadows (2014) suggest that the internet could play a vital role in preserving the quality of articles by creating systems.

I found that the technological dimension is relevant since the internet enabled the existence of OA. Next to this there is some uncertainty about univocal software or system to help develop and support of OA. This system is not yet developed and one article states that the system should be developed to solve some problems for OA. However since there is only one article which discusses the uncertainty of technological applications the uncertainty will not be taken into account when developing alternative scenarios.

4.5 Legal

For the legal dimension, I found an increase in laws and regulations pressuring the adoption of OA. These laws and regulations create resistance among parts of the industry, especially for copyright issues.

In 2003, an article discussed that bills would help to spread OA (Albanese, Bills would boost the public domain., 2003). Two years later, bills that stimulate OA, are first introduced by the NIH which created a policy to publish OA (Peek, NIH's Embattled Policy., 2005). Next to this, half of the research councils in the UK sign a mandate to stimulate OA in 2007 (Peek, 2007 Will Be More Open., 2007). In 2008, the bill from NIH to make all research OA within twelve months is signed by Bush and becomes a law (Quint & Hane, 2008). After the bill was signed into law, more bills passed to congress and several other laws are adopted by the US, UK and Europe to stimulate OA (Chant, 2014; Peet, Academic: CA Mandates OA for Tax-Funded Research., 2014; Library Journal, 2013). However some of these laws also cause resistance (Peek, NIH OA Mandate Passes., 2008; Peek, Peek, The Battle Over PubMed Central Continues., 2008). According to Peek, The Battle Over PubMed Central Continues (2008) *'On Sept. 9, Chairman of the House Judiciary Committee Rep. John Conyers, introduced H.R. 6845 (the Fair Copyright in Research Works Act) that is designed to strike down the NIH Public Access Policy and prevent other federal agencies from implementing similar policies.'* This resistance comes from publishers who are afraid that the laws of OA will undermine their revenue stream. The publishers object to mandatory OA publishing of articles funded by government (Peek, NIH OA Mandate Passes., 2008; Orsdel & Born, 2007). The publishers want the law which was signed by President Bush in 2008 to be reversed.

Next to this, there are struggles surrounding copyright and re-use rights. There is a debate about copyrights and how the copyrights should be linked to OA publishing. There are different opinions for articles to published OA. Whether the articles should be for non-commercial re-use only or whether these articles can be used for all purposes, is debated (Albanese, OA Reuse Statement., 2007; Hodgeson, 2014; Neylon, Pentz & Tanabaum, 2014; Anderson, 2015). Anderson (2015) reports a phenomenon CC BY: *'This license lets others distribute, remix, tweak, and build upon your work, even commercially as long as they credit you for the original creation.'* However CC BY causes resistance among authors since their articles can be used for commercial purposes (Anderson, 2015). Next to this, there

are signs that CC BY can aid the adoption of OA since all information can be distributed freely (Oder et al., 2010). Since there is uncertainty about the use of different copyright standards, several organizations release reports on copyright guidelines and moral right of the authors to ensure that the industry uses copyright correctly (Peek, SPARC Europe Seal Clarifies Legal Rights on OA Journals., 2008; Albanese, Open access reuse statement., 2007). The copyrights issues are also debated in congress since the government wants to ensure that there are no restrictions on using articles (Pike, 2009).

I found that there is a trend on adopting laws which pressure the establishment of OA in the industry. In addition, I also find that the industry does not maintain one standard copyright rule. The current CC BY rules cause resistance among authors while other parts of the industry favours information which can be distributed freely. Lastly, the legal dimension is linked towards the social dimension since legal CC BY issues influence the adoption of OA by authors. Next to this there are uncertainties about the implementation of laws and copyrights. Authors resist CC BY copyrights because of commercial purposes while publishers resist laws to publish OA because of loss in revenues. The government expresses itself positively about CC BY. Also it is not clear how laws are going to be implemented to ensure OA adoption. Is the government going to pressure the industry to adopt CC BY as copyright rules? Is the industry allowed to make their own rules? The different options cause struggles and uncertainty in the industry.

4.6 Summary

In sum, I have analyzed the articles per dimension and I found these answers towards my sub-questions. The political-, economic-, social-, technological-, and legal dimension of the PESTEL model play a role in pressuring OA publishing in the higher education publishing industry. The political dimension pressures the adoption of OA. Government decisions about signing bills into laws and establishing rules for OA stimulate the adoption of OA. Next to this the economic dimension plays a role. The high prices of the subscription based model cause adoption of OA. However the prices of the OA business models restrain adoption of OA. Also the struggles with quality guaranty of articles within these models and who should pay the costs for OA restrain the development of OA. Third, the social dimension restrains and stimulates OA. The adoption of OA is a result of the high prices for the subscription based model. The resistance of OA is a result of the struggles with OA business models and copyright rules. The technological dimension expresses the internet as the main reason why OA can exist. Next to this, technology could help to support the development of OA by using applications to ensure quality. Lastly the legal dimension stimulates the adoption of OA by implementing laws to ensure compliance with OA. However the copyright rules for OA cause resistance among parts of the industry.

Of these five dimensions which play a role in the higher education publishing industry, three dimensions were identified as uncertain, the economic-, social-, and legal dimension. The economic dimension is uncertain since there is no OA business model which suits the industry. Several articles opt to create a new OA business model. How the new OA business models are shaped and establishes itself in the industry is uncertain.

The legal dimension is uncertain because of the implementation of laws and copyrights. Authors resist CC BY copyrights because of commercial purposes while publishers resist laws to publish OA because of loss in revenue and the government expresses itself positively about CC BY. How the copyright rules are going to be implemented is uncertain. Also how this

will affect the industry and how the different players in the industry are going to react is uncertain.

The social dimension is uncertain as a result of the uncertainties in the economic-, and legal dimension. The resistance of OA is caused by struggles with the implementation of OA as copyright rules and costs of OA business models and quality guaranties. As there are doubts about OA, it is not clear how the adoption and resistance will develop. I can conclude that the adoption and resistance of OA is based on the changes happening in the legal- and economical dimension. The development of the economic- and legal dimension influences the social dimension.

5. SCENARIO ANALYSIS

5.1 Business models and copyright standards

The results from the research show that I can use the economic, social and legal dimensions of the PESTEL model in a scenario analysis of OA in the higher education publishing industry as these three dimensions are uncertain. Since the legal- and economic dimension are linked with the social dimension of the PESTEL model, the uncertainties of the social dimension will be clustered with the economic- and the legal dimension to sketch scenario analysis. The OA business models will be clustered with the resistance or the adoption of OA. So for the scenario analysis, the current OA business models will be accepted and for the other scenario analysis the current OA business models are resisted. These scenarios will be integrated with either the acceptance of the current copyright standards or the resistance of the current copyright standards. The current copyright standards are CC BY, non commercial re-use, copyrights held by the publisher and copyrights help by the authors. The green- gold and hybrid models are the models which currently exist in the industry. In the literature, I find a link between a business model suited for an industry and growth and success of this industry (Johnson, Christensen & Kagermann, 2000; Osterwalder, 2004; George & Bock, 2010). Therefore if the OA industry would find business models which would be accepted, this would lead to more adoption of OA. However literature studies also point out that organizations do not often focus on business model innovation (Chesbrough, 2010; Johnson, Christensen & Kagermann, 2000). Uncertain environments cause greater risks for organizations to change their business models. There is no certainty about the future developments and this could potentially result in loss of profits (Osterwalder, 2004). Next to this, business model innovation causes difficulties because new business models require new organizational structures and strategies (Chesbrough, 2010; Johnson, Christensen & Kagermann, 2000; Osterwalder, 2004). Changing structures and strategies takes time but when a valuable business model is invented it usually creates growth and increases revenue streams (Chesbrough, 2010). The copyright standards are also resisted and adopted. Literature point out that resistance against changes is critically important for the implementation success (Waddell & Sohal, 1998). If there is no resistance against, in this case, copyright rules, the adoption of OA would increase.

5.2 Scenario analysis in higher education publishing industry.

There are two scenarios which were elaborated on in more detail. Scenario 1, the combination of acceptance on current OA models and the acceptance of current copyright standards. In addition, scenario 2, is the combination of resistance on current OA business models and the resistance of current copyright standards. Only these scenarios were elaborated on as these scenarios are most suited to determine the boundaries in which all the different scenarios could take place. Since there is a lot of uncertainty about the further details and interpretation of the business models and copyright standards it seems less valuable to sketch the other two scenarios. These scenarios would merely become a combination of scenario 1 and 2 without any further details and in-depth analysis of the environment since the information retrieved from the database is limited and time is limited.

5.2.1 Scenario1: Acceptance of current OA business models and acceptance of current copyright standards.

- Acceptance on current green, hybrid and gold OA business models.
- Acceptance of the current copyright standards
- An industry with high diversity in OA models and copyright standards.

In this scenario there is acceptance on the green- gold- and hybrid- OA business model. Also the copyright standards are accepted. Based on the results from the research, the gold OA business model will be most dominant. This model will cover the costs for publishers and will guaranty the quality standards of articles. The other models will still remain in the industry as is the subscription based model. Literature points out that new business models will never fully replace the old dominant model (Markides, 2006). They will coexist next to each other. The industry has found a way to create value for the customers through the existing business models otherwise these models would not been accepted (Chesbrough, 2010). For the copyright standards it seems likely that either the CC BY copyrights will be dominant in the industry or the copyrights in which distribution is allowed only for non-commercial purposes. The CC BY could be dominant since there is some political momentum for CC BY copyright among congress. There could be political pressure to adopt CC BY copyright rules. However since other organizations favor the non commercial copyrights, this could also be adopted.

5.2.2 Scenario 2: Resistance on current OA business models and resistance current copyright standards

- Resistance on current green, hybrid and gold OA business models.
- Resistance on the current copyright standards
- Heavy investments
- Join forces to explore strategies.

In this scenario the industry is resisting the current OA business models. This results in experimenting with new OA business models. Organizations should put their focus upon business model innovation to create new opportunities. This results in great amounts of investments to explore new options (Chesbrough, 2010; Johnson, Christensen & Kagermann, 2000;

Osterwalder, 2004). Since experimenting with new business models takes time there will still be chaos in the industry. New business models require new strategies and organizational structures (Osterwalder, 2004; Chesbrough, 2010). This creates risks for organizations since they can lose a lot of money if they invest in the wrong business model innovations. Since the industries structures and strategies will change, departments, process, visions and goals need to be restructured in order to implement new business models. If the organizational processes will be adopted towards new OA business models, this will result in larger profits and growth for the industry. In this scenario, organizations need to be willing to invest heavily in OA business model innovation. Moreover the results of the research show that authors only expect that the development of a new OA model will work when different players from the industry join forces and collaborate. Oder, Blumenstein & Josh Hadro (2009) state '*We could put our shoulders behind open access and digital scholarship that isn't distributed through corporations. We could make open information a bigger part of our instruction and collection development efforts. But it will take more than libraries. It will take the will of the creators, reviewers, and editors of scholarly content and that will take money, because open access is free as in kittens.*' The resistance of current copyright standards will lead to exploration of new copyright standards. However research point out that innovation and creation of new standards can be difficult since innovation can only be explored under the restrictions of standards; this creates somewhat of a paradox (Allen & Sriram, 2000). Therefore it will be difficult for the OA copyright standards to explore new options towards copyrights. If there would be new copyrights emerging, these would probably be a combination of the already existing copyright rules.

6. CONCLUSION

I can conclude that there is turbulence in the higher education publishing industry due to OA. There are several factors as government decisions and laws pressing the adoption of OA. However the struggles with OA also restrain OA to establish itself in the industry. The main aim of the research was to find information on how the PESTEL model explains the development of OA publishing. The political-, economic-, social-, technological-, and legal dimension all influence the adoption of OA. The political dimension pressures the adoption of OA. Government decisions about signing bills into laws and establishing rules for OA stimulate the adoption of OA. Next to this, the economic dimension plays a role. The high prices of the subscription based model cause adoption of OA and the implementation of multiple OA business models. Third, the social dimension restrains and stimulates OA. The adoption of OA is a result of the high prices for the subscription based model. The resistance of OA is a result of the struggles with OA business models and copyright rules. The technological dimension expresses the internet as the main reason why OA can exist. Next to this, technology could help to support the development of OA by using applications to ensure quality. Lastly, the legal dimension stimulates the adoption of OA by implementing laws to ensure compliance with OA.

Several of the dimensions also struggle with the adoption of OA. The OA business models restrain adoption of OA due to costs and quality guaranty of articles. Also the copyright standards of the legal dimension cause resistance among parts of the industry to adopt OA. As a result, the social dimension is uncertain since the copyright rules and struggles with the OA business models create uncertainty about how the industry will react towards OA. The uncertainties caused by the economic-,

social-, and legal-, dimension restrain the adoption of OA. In the near future the focus of the higher education publishing industry should be on developing OA business models and agreements on copyright standards. It is clear that the uncertainties mostly deal with the infrastructure surrounding OA publishing. The OA business models and copyrights are factors which support the OA movement. The lack of decision making on the OA business models and copyright standards causes resistance and uncertainty. The current OA business models have not yet established itself in the industry permanently since there is resistance towards all of these models. The scenario analysis points out that alternative scenarios are possible. To establish a new OA business model, the industry should join forces. Next to this, investments in business model innovation should be made. If the current OA models will remain in the industry, then the industry should create value for the customers in these OA business models. Next to this, the copyright rules can establish themselves in the industry or new copyrights can be created. The current industry consists of different copyrights applied in the same industry. There are uncertainties, especially about CC BY. The acceptance of CC BY copyrights only exists when there is political pressure to adopt the CC BY copyrights since authors are resisting this copyright. If the uncertainties of the models and copyright standards are addressed, a more specific future for OA can be sketched. This results in more knowledge about the future developments of OA. OA is here to stay in the industry. However how OA will establish itself in the industry is unclear.

7. DISCUSSION

There are several discussion points of this research. First, the application of the PESTEL model. The model is used to frame pressures from the external environment. Because the environment depends on the industry in which the PESTEL model is applied, there is no univocal pre coded scheme. For future research the PESTEL model could be applied in the higher education publishing industry to strengthen the sub-factors used in this research. Next, the classifications of the different PESTEL dimensions. Not all the articles could be framed within the model. Some articles discussed the quality of trade journals without further elaboration. These articles could not be placed within the framework but could have been useful to strengthen the research. From the 214 trade journals, 85 were used within this research. This can either be a result of the PESTEL model which could not frame these factors or the interpretation of these articles.

The PESTEL model explains external factors pressuring the industry. Analyzing these factors is useful to identify the factors which the entire industry needs to take into account. Since the model does not explain the forces working from within the industry. Future research can take this research as a starting point to analyze the forces working within an industry. Next to this, this research can be used as a starting point for companies in the higher education publishing industry to do a SWOT analysis. The opportunities and threats of the higher education publishing industry are identified by the PESTEL model. This information can be used to apply the SWOT analysis within companies and make strategic decisions.

The data in this research was retrieved from one database. This database slightly focused on the UK, US and Europe. Also the journals in which most of the articles were published were either Information Today or Library Journal. Out of the 214 trade journals, 117 were published in Information Today and 63 were published in Library Journal. For future research it could

be interesting to use another database to see whether additional information can be retrieved on OA.

The uncertainties chosen for the research have implications for the scenario analysis. Other uncertainties would have resulted in different scenarios. It seems likely that there are more uncertainties which can be explored in other databases. These uncertainties could be explored in further research to see what kind of different scenarios this might give. These new scenarios could complement this research and gain valuable insights for the industry. Next to this, future research could use the scenario analysis as a starting point to develop the other two scenarios or to create a more in-depth scenario analysis. This could lead to additional insights for the higher education publishing industry.

The choice for trade journals also has implications for the results of the research. Trade journals are not based on qualitative or quantitative research but on the opinions and events happening at that moment. It would be interesting to see whether scientific articles could complement the results from the research. Lastly, the results of the research showed a relative great amount of OA trade journals writing about the PESTEL dimensions, and especially the social dimension, between 2005 and 2009. It might be interesting to see whether future research also comes up with these numbers and whether there is a trend in writing about the social dimension between 2005 and 2009.

8. ACKNOWLEDGEMENTS

9. REFERENCES

Albanese, A. (2003). Bills Would Boost the Public Domain. *Library Journal* , 16-17.

Albanese, A. (2005). Cornell: Open Access Costly. *Library Journal* , 19-20.

Albanese, A. (2007). Open Access Reuse Statement. *Library Journal* , 16.

Albanese, A. (2007). Open Access: ARL vs. Publishers. *Library Journal* , 14.

Albanese, A. (2004). Report: Open Access Cheaper. *Library Today* , 24-25.

Albanese, A. (2004). UK Report Calls for Publicly Available STM Research. *Library Journal* , 16-17.

Allen, ,. R., & Sriram, R. (2000). The Role of Standards in Innovation. *Technological forecast and social change* , 171-181.

Anderson, R. (2015). CC BY and Its Discontents: An OA Challenge. *Library Journal* , 16.

Ashling, J. (2007). Brussels 2007: The OA Debate Rages On. *Information Today* , 28-29.

Ashling, J. (2007). Opening the Door to Public Access to Publicly Funded Research. *Information Today* , 22-23.

Ashling, J. (2009). Report Examines Costs of OA Publishing. *Information Today* , 22-23.

Berry, J. (2010). New Hope for Open Access. *Library Journal* , 10.

Besancenot, D., & Vranceanu, R. (2016). A model of scholary publishing with hybrid academic journals. *Springer Science + Business* .

Björk, B. -C., & Solomon, D. (2012). Pricing principles used by scholarly open access publishers. Learned Publishing, 25(2), 132-137.

Björk, B. C., Laakso, M., Welling, P., & Paetau, P. (2014). Anatomy of green open access. Journal of the Association for Information Science and Technology, 62(2), 237-250. 3

Bjork, B.-C., Roos, A., & Lauri, M. (2009). Scientific journal publishing: yearly volume and open access availability . *Information research* , 1-14.

Björk B, Welling P, Laakso M, Majlender P, Hedlund T, et al. (2010) Open Access to the Scientific Journal Literature: Situation 2009. PLoS ONE, 1-9

Boettcher, J. (2006). Framing the Scholarly Communication Cycle. *Online* , 24-26.

Bosch, S., & Henderson, K. (2013). The Winds of Change. *Library Journal* , 28.

Bosch, S., & Henderson, K. (2015). WHOLE LOTTA SHAKIN' GOIN' ON. *Library Journal* , 30-35.

Bull, J., & Atchison, A. (2015). Will Open Access Get Me Cited? An Analysis of the Efficacy of Open Acces Publishing in Politial Science. American Political Science Association , 129-137.

Bulock, C., Hosburgh, N., & Mann, S. (2015). OA in the Library Collection: The Challenges of Identifying and Maintaining Open Access Resources. *The Serials Librarian: From the Printed Page to the Digital Age* , 79-86.

Calmthout, M. v. (2015 , 10-december). Universiteiten en Elsevier sluiten deal over artikelen. volkskrant .

Chant, I. (2014). Academic: Buget Good News for Open Access. *Library Journal* , 19.

Chesbrough, H. (2010). Business model innovation. Opportunities and barriers. *Long Range Planning* , 354-363.

Chi, M. (2006). Two Approaches to the Study of Experts Characteristics. In *Th Cambridge Handbook of Expertise and Expert Performance* (pp. 21-31). Cambridge: Cambridge University Press.

Clobridge, A. (2015). Introducing 'Generation Open': The Next Generation of Open Advocates. *Online Searcher* , 68-70.

Clobridge, A. (2013). You Say You Want a Revolution? *Online Searcher* , 38-43.

Crawford, W. (2008). Open Access: It's Never Simple. *Online* , 58-60.

Dawson, D. (2014). The Scholarly Communications Needs of Faculty: An Evidence Based Foundation for the Development of Library Services. *Evidence Based Library & Information Practice* , 4-28.

Dekker, S. (2016, mei 27). Hoog tijd voor vrij verkeer van kennis en data in Europa. *Volkskrant* , p. 1.

Djurkovic, H. (2014). Debate: Open Access in academic journal publishing. *Public Money & Management* , 8-10

Drake, M. (2007). Scholarly Communication in Turmoil. (cover story). *Information Today* , 1-19.

Eger, T., Scheufen, M., & Meierrieks, D. (2015). The determinants of open access publishing: survey evidence from Germany. *European Journal Law & Economics* , 475-503.

Enis, M. (2015). ER&L Highlights E-Resource Trends. *Library Journal* , 15-16.

Galin, J., & Latchaw, J. (2010). From Incentive to Stewardship: The Shifting Discourse of Academic Publishing. *Computers and Composition* , 211-224.

George, G., & Bock, A. (2010). The Business model in practice and its implications for entrepreneurship research. *ET&P* , 83-111.

Greenwoord, R., Diaz, A. M., Xiao Li, S., & Cespedes Lorente, J. (2010). The Multiplicity of Institutional Logics and the Heterogeneity of Organizational Responses. *Organization Science* , 521-539.

Guardon, C.-J. (2004). The "Green" and "Gold" Roads to Open Access: The Case for Mixing and Matching. *Serials Review* , 315-328.

Gumport, P. (2000). Academic restructuring: Prganizational change and institutional imperatives. *Higher Education* , 67-91.

Hane, P. (2003, March). New Developments in Content Licensing, Open-Access Publishing, and More. *Information Today* , 7.

Harnad, S. (2015). Optimizing Open Access Policy. *The Serials Librarian* , 133-141.

Hawkins, D. (2005). Does Open Access Publishing Really Work in Practice? *Information Today* , 40-41.

Hodgson, C. (2014). OPEN ACCESS INFRASTRUCTURE: WHERE WE ARE AND WHERE WE NEED TO GO. *Information Standards Quarterly* , 4-14.

Hogan, T. (2004). The Fall 2004 ASIDIC Meeting. (cover story). *Information Today* , 1-54.

Hsieh, H.-F., & Shannon, S. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research* , 1277-1288.

Ignacio, J., Fernandez, P., Cala, A., & Domecq, C. (2011). Critical external factors behind hotels' investments in innovation and technology in emerging urban destinations. *Tourism Economics* , 339-357.

Information Today. (2006, February). *Open Access Update.* Retrieved June 10, 2016, from Ebscohost: http://web.b.ebscohost.com/ehost/detail/detail?vid=12&sid=645 91572-170a-4c79-aeab-f1cd3468e80b%40sessionmgr107&hid=123&bdata=JnNpdGU9 ZWhvc3QtbGl2ZQ%3d%3d#AN=19715361&db=lxh

Information Today. (2016, May). Sci-Hub, Elsevier, Piracy, and the Future of Scholarly Publishing. *Information Today* , pp. 1-26.

Johnson, G., Scholes, K., & Whittington, R. (2005). *Exploring Corporate Strategy.* Harlow: Pearson Education Limited.

Johnson, G., Whittington, R., & Scholes, K. (2011). *Exploring Strategy.* Essex: Pearson Education Limited.

Johnson, M., Christensen, C., & Kagermann, H. (2000). Reinventing your Business model. *Harvard Business Review* , 58-68.

Kaser, D. (2008). OA and the End Game. *Information Today* , 14.

Kaser, D. (2007). OA in 2006: Three Tidbits. *Information Today* , 14.

Kaufman, R. (2013). The OA Movement Will Continue to Gain Momentum. *Information Today* , 33.

Kennedy, S. D. (2012). Dazed and Confused. *Information Today* , 25.

KNAW (2016). Open boek over open access. Onderzoekers aan het woord, Amsterdam, KNAW.

Kremer, P., & Symmons, M. (2015). Mass timber construction as an alternative to concrete and steel in the Australia building industry: A PESTEL evaluation of the potential. *International Wood Products Journal* , 138-147.

Kumar, K. (2014). A Scientometric Study of Digital Literacy in Online Library Information Science and Technology Abstracts (LISTA). *Library Philosophy and Practice (e-journal)* , Paper 1044.

Laakso, M., Welling, P., Bukvova, H., Nyman, L., Bjork, B.-C., & Hedlund, U. (2011). The Development of Open Access Journal Publishing from 1993 to 2009. *Plosone* .

LaGuardia, C. (2005). Readers' Delight. *Library Journal* , 27.

Library Journal. (2013 йил 1-June). *California Open Access Bill Clears Committee.* Retrieved 2016 йил 8-June from Ebscohost: http://web.b.ebscohost.com/ehost/detail/detail?vid=30&sid=486 f53bb-965d-4982-bed2-60d8e58ca488%40sessionmgr107&hid=124&bdata=JnNpdGU 9ZWhvc3QtbGl2ZQ%3d%3d#AN=87800328&db=lxh

Mahajan, R., Barthel, J., & Marshall, J. (1996). Approppriateness of Referrals for Open-Access Endoscopy. How Do Physicians in Differen Mediacal Specialties Do? *JAMA Internal Medican* , 2065-2069.

Markides, C. (2006). Disruptive Innovation: In Need of Better Theory. *Journal of product innovation management* , 19-25.

Neylon, C., Pentz, E., & Tananbaum, G. (2014). Standardized Metadata Elements to Identify Access and License Information. *Information Standards Quarterly.* , 35-37.

Oder, N., Albanese, A., & Whelan, D. L. (2009). OPEN ACCESS APPROVED AT MIT, OSU, HARVARD'S K-SCHOOL. *Library Journal* , 12.

Oder, N., Berry, J., Hadro, J., Horrocks, N., & Lau-Whelan, D. (2010). Reality Check on Open Access Monographs. *Library Journal* , 15.

Oder, N., Blumenstein, L., & Hadro, J. (2009). OPEN ACCESS FUNDING BOOST. *Library Journal* , 13-14.

Ojala, M. (2015). FRONT Lines. Dynamic Disruption. *Online Searcher* , 4.

Ojala, M. (2005). open open Sesame or opening Pandora's Box? *Econtent* , 30-35.

Osterwalder, A. (2004). *The business model ontology. A proposition in a design science approach.* Lausanne: l'Université de Lausanne.

Peek, R. (2007). 2007 Will Be More Open. *Information Today* , 15-16.

Peek, R. (2008). Harvard Faculty Mandates OA. *Information Today* , 15-17.

Peek, R. (2008). NIH OA Mandate Passes. *Information Today* , 15-16.

Peek, R. (2005). NIH's Embattled Policy. *Information Today* , 17-18.

Peek, R. (2011). Reports on Access to Research. *Information Today* , 25.

Peek, R. (2008). SPARC Europe Seal Clarifies Legal Rights on OA Journals. *Information Today* , 19-20.

Peek, R. (2008). The Battle Over PubMed Central Continues. *Information Today* , 17-18.

Peek, R. (2006). The Battles of Open Access. *Information Today* , 17-18.

Peek, R. (2009). The Tide Has Changed, Get Over It. *Information Today* , 13-15.

Peek, R. (2008). With Growth Comes Growing Pains. *Information Today* , 17-18.

Peet, L. (2014). Academic: CA Mandates OA for Tax-Funded Research. *Library Journal* , 1.

Peet, L. (2014). Academic: Open Humanities Library Progresses. *Library Journal* , 14.

Pike, G. (2009). Access to Federally Funded Research Back to Congress. *Information Today* , 13-16.

Postma, T., & Liebl, F. (2005). How to improve scenaio analysis as a strategic management tool? *Technological Forecasting& Social Change* , 161-173.

Poynder, R. (2005). Essential for Science. . *Information Today* , 1-58.

Qasim, J., & Khan, A. M. (2015). Awareness and Use of E-journals by the Scientists of CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi, and Indian Institute of Chemical Biology (IICB), Kolkata, India: A Comparative Study. *Library Philosophy and Practice* , Paper 1202.

Quinn, M. M. (2015). Open Access in Scholary Publishing: Embracing Principles and Avoiding Pitfalls. *The Serials Librarian* , 58-69.

Quint, B., & Hane, P. (2008). Google Developments, Access to Public Resources, and More. *Information Today* , 7-12.

Ratner, H., & Meadows, A. (2014). CHORUS Helps Drive Public Access. *Information Standards Quarterly.* , 32-34.

Schwartz, M. (2013). Agencies Required To Open Access, Data. *Library Journal* , 26.

Schwartz, M., McGuire, V., & Warhurton, B. (2013). AMHERST LIBRARIAN LAUNCHES OPEN ACCESS PRESS. *Library Journal* , 18.

Shen, C., & Bjork, B.-C. (2015). ' Predatory' open access: a longitudinal study of article volumes and market characteristics. *BMC Medicine* , 1-15.

Shilei, L., & Yong, W. (2009). Target-oriented obstacle analysis by PESTEL modeling of energy efficiency retrofit for existing residential buildings in China's northern heating region. *Energy Policy* , 2098-2101.

Springer. (2016, 17-February). *Journal price list.* Retrieved 2016 ,30-March from Springer: https://www.springer.com/gp/librarians/journal-price-list

Suber, P. (2004 йил 13-October). Creating an intellectual commons through Open Access. Bloomington, Indiana, America.

Swayne, L., Duncan, J., & Ginter, P. (2008). *Strategic Management of Health Care Organizations.* London: Wiley.

Sweeney, D. (2014). Working together more constructively towards open access. *Information Services* , 181-184.

Van Orsdel, L., & Born, K. (2005). Choosing Sides. *Library Journal* , 43-48.

Vecchiato, R., & Roveda, C. (2010). Strategic foresight in corporate organizations: Handling the effect and response uncertainty of technology and social drivers of change. *Technological Forecasting & Social Change* , 1527-1539.

VSNU. (2016). *The Netherlands: paving the way for open access.* The Netherlands: Ezine.

Wadell, D., & Sohal, A. (1998). Resistance: a constructive tool for change management. *Management decision* , 543-548.

Walsh, P. (2005) Dealing with the uncertainties of environmental change by adding scenario planning to the strategy reformulation equation. Management Decision, 113 - 122

Ware, M., & Mabe, M. (2015). *The STM Report: An overview of scientific and scholarly journal publishing.* Nebraska: Libraries at university of Nebraska-Lincoln.

Watkinson, A., Nicholas, D., Thornley, C., Herman, E., Jamli, H., Volentine, R., et al. (2016). Changes in the digital scholary environment and issues of trust: An exploratory, qualitative analysis. Information Processing & Management , 446-458.

10. APPENDIX

	Social	Related towards other PESTEL dimension
Peet, Lisa, 2014 Academic: Open Humanities Library Progresses.	There is a social behaviour towards adopting and resisting OA. Some favour adopting OA because of the price inflation of journals, while publishers are resisting OA as it undermines their revenue. Moreover resistance because of mandate system for OA	Social dimension is caused by economic dimension. Since the resistance and adoption of OA is based on **inflation of prices** and **undermining revenue costs.** There is also a link towards legal since there is reluctance to adopt because of **a mandate system**

Academic: Open Humanities Library Progresses. By: Peet, Lisa. Library Journal. 11/1/2014, Vol. 139 Issue 18, p14-14. 1p.

Martin Eve builds OA platform

Martin Eve is a lecturer on 20th- and 21st-century American fiction at the University of Lincoln in the UK, with an impressive list of journal articles, book chapters, conference papers, and professional affiliations. His most recent book, Open Access and the Humanities: Contexts, Controversies and the Future, will be published by Cambridge University Press this November.

At the moment, however, he is on research leave in order to concentrate on developing his new venture, the Open Library of the Humanities (OLH). On September 23, Eve spoke at Columbia University's Butler Library on open access in the humanities, at which time he discussed the need for open access (OA) in scholarly publishing, how it works, the challenges it faces, and some workable potential solutions, including OLH.

OA--scholarly work that is peer-reviewed, free to read online, and freely available for reuse--has been gaining traction in the academic and research communities over the past decade, either on the "green" OA model, in which authors self-archive their work in a publicly accessible repository, or the "gold," where the work is published in an OA journal.

At the same time, a fair amount of resistance still exists. Publishers object to OA on economic principles, as it undermines the revenue generated by journals.

Institutional and funder mandates, which require that researchers make their work available on an OA basis, have helped spur compliance both in the United States and abroad. Most of this progress is occurring in the science, technology, engineering, and mathematics (STEM) fields, largely owing to the escalating costs of scientific publications, which make OA journals an appealing alternative. Journal prices have steeply outpaced inflation, not to mention library budgets. But there is also a measure of urgency for OA initiatives within the humanities and social sciences (HSS).

A single ecosystem

Humanities research traditionally has a low deposit rate in repositories. This is in part because journals will keep HSS articles under embargo often twice as long as STEM work, as the citation half-life is longer--scientific data becomes obsolete far more quickly than humanities research. HSS publication cycles and peer-review processes are longer as well.

The gold model of OA journal publishing offers some solutions, but they are not always as feasible for HSS as they are for STEM. Article processing charges can be prohibitive, especially as humanities studies are rarely funded as fully or via the same mechanisms as STEM research.

Eve feels that the economies of HSS and STEM form a single ecosystem, with similar problems and opportunities. The initial concept for OLH, in fact, was modeled on the Public Library of Science, an open access consortium of scientific journals.

Eve envisions OLH as a consortial platform with the authority of established names behind it. Together with his fellow academic project director, Caroline Edwards, Eve has developed OLH on the Library Partnership Subsidy model, in which libraries join forces to support the infrastructure of an OA platform rather than simply purchasing individual journals.

In April 2014, the University of Lincoln secured an initial planning grant from the Andrew W. Mellon Foundation to help build and launch OLH. This will involve developing a business model to ensure its sustainability, soliciting and processing articles, and building the infrastructure. Sign-ups are not yet open, but OLH has had expressions of interest from some 65 libraries, with a firm commitment from the Wellcome Trust, and 150 articles pledged. Eve plans to launch OLH in spring or summer 2015, with 90 libraries and four or five journals to be phased in.

Even given the widespread reluctance to adopt OA practices that necessitates a mandate system, Eve has high hopes for the future of OA. Academic libraries can do their part by talking to faculty about OA, he advises; the same problems exist everywhere, and researchers need to be walked through the process in order to demystify it. And while gold--scholarly work freely available in OA journals--is the ultimate goal, Eve told LJ, "Green [is] the way to go in order to fix the mess we've made."

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