Questioning Authority: Patents and Source Evaluation in an Era of Misinformation

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Abstract

In the world of academic research, patents are classified as primary literature, and are recognized as “a rich source of technical, legal and business information presented in a generally standardized format and often not reproduced anywhere else” (World Intellectual Property Organization, 2015, p.4). Because of their status, patents are often left out of conversations surrounding source credibility and evaluation. Recent news relating to the conspiracy theories surrounding the COVID-19 pandemic and several patents, however, demonstrates the potential use of patents in spreading misinformation and disinformation. Through applying source evaluation techniques in keeping with the Association of College & Research Libraries’ (ACRL) Framework for Information Literacy for Higher Education, particularly the frames “Authority is Constructed and Contextual” and “Information Creation as a Process,” librarians and other educators can encourage students to take a more nuanced view of patents as information sources.

Introduction

When false information is spread, various information sources such as research articles, editorials, and statistics are often misquoted or misinterpreted. We see this in the current COVID-19 ‘infodemic’ where both accurate and false information about the virus’ origins, transmission rates, impact, and vaccine is spread via different platforms and organizations (Ghebreyesus, 2020). Part of the current state of misinformation and disinformation surrounding COVID-19 involves the misinterpretation of patents. Recent conspiracy-based documentaries like Plandemic (since removed from social media and streaming sites) have used patents as evidence in their claims that COVID-19 was a human invention, obscuring the fact that the word "coronavirus" refers to a subfamily of viruses, and the patents in question were tied to other related viruses, not COVID-19 (Jarry, 2020). Because patents are widely considered to be trusted information sources, however, using (or misusing) them in support of arguments carries a certain weight.

Source evaluation techniques, often highlighted by librarians trying to fight misinformation, are not generally applied to patents. Patents’ status as official legal documents detailing inventions ascribes them with an inherent credibility. As source evaluation techniques adapt to address the serious problem of misinformation by interrogating the concepts of authority and information creation, however, it is important to look at how patents fit into the current infodemic, and how to critically evaluate them as information sources. In this paper I will briefly review how disinformation, misinformation, and conspiracy theories work, and why they are difficult to eradicate. Then I will examine how source evaluation techniques have changed over the past several years to try and address this growing concern, and how the Association of College & Research Libraries’ (ACRL) Framework for Information Literacy for Higher Education, particularly the frames, “Authority is Constructed and Contextual” and, “Information Creation as a Process” (Association of College & Research Libraries, 2015), reflect and encourage this change. Finally, I will discuss how these techniques can be applied to patents, and the ways in
which looking at patents can improve students' source evaluation skills overall.

Disinformation, misinformation, and conspiracy theories

As terms, disinformation and misinformation are often used interchangeably. The difference is difficult to discern, as it relies on intent, but disinformation generally refers to false information that is knowingly spread, while misinformation is false information that is spread with or without the intent to deceive or mislead (Jaiswal et al., 2020). A conspiracy theory, according to Keeley (1999), is "a proposed explanation of some historical event (or events) in terms of the significant causal agency of a relatively small group of persons--the conspirators--acting in secret" (p.116). Conspiracy theories can be created using misinformation and disinformation, and feed on fear, anxiety, and uncertainty, which can often lead people to reject scientific consensus (Douglas et al., 2019; O’Connor & Weatherall, 2019). "Conspiracy theories are primarily built upon negative evidence - gaps or ambiguities in current knowledge" (Brotherton, 2013, p.25). The effects of misinformation, disinformation, and conspiracy theories are significant, and are felt acutely during the current pandemic. In March of 2020, the Pew Research Center conducted a survey that showed that 29% of Americans believed that COVID-19 was a human-made virus created in a lab (Schaeffer, 2020). According to another recent survey, approximately fifty percent of Americans intend to get the COVID-19 vaccination (Cornwall, 2020), and their hesitancy is tied to misinformation about the virus and the vaccine, especially within the online environment (Santos-Rutschman, 2020).

The spread of false information within public health is not a new phenomenon. Viruses, pathogens, and vaccinations have long been surrounded by misinformation (Heller, 2015; O’Connor & Weatherall, 2019; Owen, 2018). The spread of misinformation is difficult to counteract, as once someone is exposed to misinformation, it can be very difficult to change their mind (Lewandowsky et al., 2017; Sullivan, 2019). Psychological and social drivers like cognitive authority—how people determine what is true based on their own experience and secondhand information from others (Angell & Tewell, 2017; Russo et al., 2019)—and conformity bias—where people align their opinions with others even if they feel they are incorrect (O’Connor & Weatherall, 2019)—both factor into the difficulty present when trying to correct the harm of misinformation. The spread of false information also disproportionately affects marginalized groups (Jaiswal et al., 2020), which can place those already at a disadvantage in receiving quality healthcare through structural inequalities in even more danger. It will take ongoing, widespread efforts to even attempt to curtail the current infodemic, and information literacy education is certainly not the beginning and end of that effort (Sullivan, 2019), but teaching students to develop a critical mindset remains an important task.

Source Evaluation and The ACRL Framework

As the problem of misinformation has grown in severity, librarians have begun rethinking and evolving source evaluation techniques in library instruction. The ACRL Framework for Information Literacy for Higher Education emphasizes the complex nature of the information landscape and the changing information literacy needs of students. Two of the frames in particular, "Authority is Constructed and Contextual" and "Information Creation as a Process," apply directly to the growing complexities within source evaluation.

In the "Authority is Constructed and Contextual" frame, experts "view authority with an attitude of informed skepticism and an openness to new perspectives, additional voices, and changes in schools of thought" (Association of College & Research Libraries, 2015, para. 8). The balance between informed skepticism and openness is important, as misinformation, disinformation, and conspiracy theories feed on doubt and uncertainty. As O’Connor & Weatherall (2019) note in their work on misinformation, the goal of source evaluation is not to reach one hundred percent certainty, but to be confident enough to make an informed decision based on evidence, to work off of "evidentially-grounded belief" (p.29). The frame emphasizes moving from relying on indicators of authority (such as peer review) to a more balanced perspective of understanding the importance of expertise while “remaining skeptical of the systems that have elevated that authority and the information created by it” (Association of College & Research Libraries, 2015, para, 8), learning to not only
work with and recognize authoritative sources, but to develop one’s own authoritative voice.

The “Information Creation as a Process” frame underscores the importance of viewing sources as information products. Learners analyze sources based on the processes by which they were created, and factor this into their critical evaluation, recognizing that “information may be perceived differently based on the format in which it is packaged” (Association of College & Research Libraries, 2015, para.13). Examining formats this way exposes a lot of the nuance inherent in information creation. If an information product is published in a peer-reviewed journal, for instance, it is widely considered to have more credibility as a source. A letter to the editor is significantly different from a research article, however, and both can be present in a peer-reviewed journal and show up in the same list of search results.

Even prior to the publication of the ACRL Framework, research on source evaluation reflected the points emphasized in these two frames. The checklist method of source evaluation, which relies on specific metrics students can review to decide whether content in a source is credible or not, has been criticized as being too mechanistic and discouraging critical thinking (Meola, 2004; Ostenson, 2014). Recently, several studies have suggested alternative and supplemental methods. The results of Wineburg and McGrew’s (2017) study showed that both students and faculty had trouble critically evaluating websites using standard checklist methods, and recommended modeling source evaluation instruction on fact-checking techniques such as lateral searching. This type of searching allows researchers to view how information is being reported across sources, providing context. Other methods proposed focus on metacognition and collaborative learning in an effort to acknowledge and deal with the psychological and social factors present in the spread of misinformation. Russo et al. (2019) proposed an evaluative strategy which acknowledges the complexities inherent in source evaluation and emphasizes the role an information source’s format can play. Lenker (2017) proposed a developmentalist approach, focusing on evaluating information sources based on how much they contribute to students’ learning. Tewell and Angell (2017) have emphasized the importance of promoting student authority in the evaluation of sources, and having students explain the criteria they use when assessing credibility.

**Patents as an Information Source**

These evolving ideas of source evaluation reflect the themes in the frames “Authority is Constructed and Contextual” and “Information Creation as a Process” by placing information sources in the context of the larger information landscape, and by delving deeper into sources and their formats. They also stress the importance of examining how students critically interact with information. Though research on source evaluation typically focuses on websites, articles, or information in a more general sense, these ideas and themes can be applied to patents. Examining the context and creation of patents as an information source reveals the complex nature of patents and illustrates the importance of evaluating them critically.

Patents are legal documents which grant exclusive rights of manufacture, sale, use, and import of inventions. A patent includes detailed technical information and specific legal claims relating to the invention, all of which are made available publicly. Researchers can use patents to trace the history of technological advancement, find the most recent breakthrough technologies, and find prior art if they are interested in patenting their own inventions (Zwicky, 2019). In order to be granted a patent in the United States, an invention must be determined to be novel, non-obvious, and useful by examining technology centers that are part of the United States Patent and Trademark Office (USPTO). Once patents are granted, they are in effect for a set period of time, provided that the patent owner, or assignee, pays the required maintenance fees. Throughout the patent’s term, no one outside of the owner is permitted to manufacture, sell, use, or import any invention that infringes on the claims in the patent (United States Patent & Trademark Office, 2015).

Because patents are formally examined before being granted and can be litigated in cases of infringement, they are considered to be factual, and representative of unique, new inventions (Segal, 2018). While this might suggest patents don’t require source evaluation, there has been considerable research published dedicated to exploring the flaws in the patent granting process and the questionable validity of many patents. The large number of patents that have
been litigated has led researchers to wonder whether the USPTO has overgranting tendencies (Chien, 2018; Frakes & Wasserman, 2015; Henkel & Zischka, 2019; Lemley et al., 2005). The patent litigation process has also been called into question (Gugliuzza, 2016; Yelderman, 2014), and the criteria for patent granting has been accused of being ill-defined (Abbott, 2019; Chien, 2018). Even if patents are determined to be valid, that is not necessarily a comment on the inventions’ quality. “Inventions can meet all of the relevant criteria to be granted a patent without being the optimal solution to a given problem” (Zwicky, 2019, p.11).

There are other ongoing controversies surrounding patents and their quality. Patent trolls make patent language deliberately vague and broad in order to cover a large area for which people need to pay licensing fees to use during the patent term, even if the patent holder has no intention of actually making anything during that time (Zwicky & Stonebraker, 2021). United States Supreme Court rulings in 2013 and 2014 discouraging the behavior of patent trolls led to tension surrounding patent specificity requirements (Ledford, 2013, 2015). There is also quite a bit of controversy over how patents are used during pandemics. Because patents restrict who can manufacture, sell, import, and use inventions, they have the potential to impede drug discovery and access during public health crises (Santos Rutschman, 2020; Sherman & Oakley, 2003).

The specialized technical and legal information in patents make them invaluable for researchers who are interested in design, invention, or intellectual property across disciplines, and patents represent information that is not often included in scholarly literature (Segal, 2018). Because of the specialized legal and technical information they contain, however, patents are notoriously difficult to interpret for non-experts. They are filled with scientific jargon and legalese, and are typically refined and reviewed by legal professionals with expertise in the type of technology being described (Zwicky, 2019). The technical description of the invention in a patent, known as the specification, is very particular to the invention; “words and phrases in a specification do not have the same meaning they have in everyday life. Their meaning is determined by the way they are defined in the specification” (Segal, 2018, p.3). Though the technical background and description might seem somewhat similar to a research article, the references are often to other patents rather than scholarly literature (MacMillan & Thuna, 2010).

These barriers to the interpretation of patents are where misinformation, disinformation and conspiracy theories can proliferate. This can occur with any technical information that is difficult to interpret for a nonexpert, with added confusion caused by patents’ unique structure and layout. The misleading documentaries about COVID-19 involving patents exploited a lack of knowledge of medical terminology. They claimed the existence of patents mentioning the word “coronavirus” indicated that the virus was human-made since only human-made inventions can be patented. The patents cited in the documentaries and other false sources were not for the invention of the current coronavirus, COVID-19, but other viruses that are termed ‘coronavirus’ because they belong to that particular subfamily of viruses. This subfamily includes coronaviruses, both naturally occurring and human-made which cause illnesses in birds and pigs, as well as SARS-CoV, the virus responsible for SARS (Jarry, 2020).

Because patents have a unique format and vocabulary, searching for patents can also present challenges. Databases and search tools for patents offer a variety of ways to find patents, but are not easily navigable without prior knowledge of patents as an information source. Patents are organized by classification systems, so it is important to be able to search for patents using both the controlled vocabulary of the patent system and appropriate keywords (MacMillan & Thuna, 2010). The USPTO recommends using the Seven Step Strategy, which includes brainstorming keywords and navigating Cooperative Patent Classification (CPC) schemes (United States Patent & Trademark Office, n.d.). The hierarchical structure of the CPC might not be intuitive to researchers in different disciplines who are accustomed to a different organization of concepts (Härtinger & Clarke, 2016).

Keyword searching also presents a challenge. Patent titles and abstracts do not resemble those of journal articles, and do not lend themselves to standard keyword searching (MacMillan, 2005). Inventors often file patent applications without being able to anticipate all possible future use applications, and the technical details of patents focus on describing the invention in a way that it can be reproduced. For
instance, a patent for a prosthetic leg will likely devote more words to the mechanism controlling its movement or the way it attaches to the body than to how it aids in walking or climbing. MacMillan and Thuna (2010) suggest that students searching for patents need to learn to think about how inventions work rather than how they are used. Patent search tools like Google Patents have become increasingly user friendly over the past several years, making it easier to find related patents through citation tracking and classification numbers. Still, researchers need to become familiar with patents to understand the different features of search tools. For instance, both granted patents and patent applications are indexed in Google Patents, and are listed together in search results, which could lead to confusion to researchers unfamiliar with the distinction. Similar confusion can be caused with regard to expired patents, or patents that have been litigated.

Source Evaluation Instruction

Understanding the complexities inherent in patent creation, organization, and authority gives a clearer idea of how students can be taught to critically evaluate patents. MacMillan and Thuna (2010) advocate for having students consider whether or not a patent they found should have been granted, and why or why not. This type of task addresses the question of patent validity, and positioning students in the role of examiner increases their own sense of authority (Zwicky & Stonebraker, 2021). Once students determine whether or not the patent should have been granted, they can share their reasoning with each other and explain how they arrived at their decision (Angell & Tewell, 2017). This can prompt a discussion of some of the controversies surrounding patents and the patent granting process. Depending on the students’ familiarity with the technical language used in the patent, it might be more effective to have students examine patents that have been litigated, or compare two patents that had been involved in an infringement case, and have them weigh in. Students new to learning about patents but more familiar with scholarly literature might benefit from analyzing the patent granting process alongside peer-review, and looking at the benefits of and criticisms to both.

Because patents are so difficult to interpret by non-experts, it is important to call attention to that difficulty and, in addition to trying to mitigate it where possible through search strategies and familiarizing students with patent layouts, to acknowledge the risk of misinterpretation. When teaching patents, Garnai and Gauder (2020) used learning objectives from the Society of American Archivists’ (SAA) Guidelines for Primary Source Literacy, which state that investigating a primary source “may require the ability to read a particular script, font, or language, to understand or operate a particular technology, or to comprehend vocabulary, syntax, and communication norms of the time period and location where the source was created” (Society of American Archivists, 2018, p.5). This reinforces the idea that patents require work to interpret. Another way to highlight this is to look at how patents are reported on in popular news sources, and have students compare the original patent to the reporting with guiding questions. This type of activity will give students the opportunity to examine and evaluate both sources critically (Majetic & Pellegrino, 2014).

Because of their unique format, terminology, and creation process, understanding and interpreting patents to evaluate them requires time and critical and information literacy skills. Through this process, students are able to develop a greater understanding of how authority is conferred and how the process by which an information product is created and distributed can influence how it is interpreted (and misinterpreted). Learning this and knowing that even sources considered inherently authoritative should be evaluated will be invaluable for students when approaching any given information source critically.

Conclusion

With the increased presence of misinformation, disinformation, and conspiracy theories, source evaluation techniques have been evolving to recognize the nuance and complexity of information. Source evaluation techniques that demonstrate the importance of breaking down concepts like authority and exploring the processes by which information is created are well suited for applying to patents. By examining patents more critically rather than accepting their given authority without question, students can better understand the principles of critical source evaluation.
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