Conclusion
In this dissertation I argue that the analysis of digital media content needs an approach that takes into account the specificities of how platforms and engines serve, format, redistribute and essentially co-produce content. These specificities are what I refer to as the technicity of content. The foundational work that established the field of content analysis, developed within communication science, paved the way for the analysis of (large) bodies of text for features or (recurring) themes, in order to identify “cultural indicators” (Gerbner) or make other inferences about societal trends and issues. While content analysis has seen a tremendous uptake across scientific disciplines, the application of these methods to networked web content has presented an ongoing challenge for researchers of various scholarly disciplines. In this dissertation, I therefore propose to improve the adaptability and fit of content analysis to networked content through a range of digital methods and tools that I show to be conducive to the task. The work of Klaus Krippendorff, a major proponent and methodological innovator of content analysis as a field of media research, is a key driver of my own development of what I name and develop in this dissertation as networked content analysis. As content analysis has been inclusive of content (in all shapes and forms) and its context since its early beginnings, its methods only need to be amended to suit the digital era, and deal explicitly with the technicity of networked content (Krippendorff, 2004). I propose to utilize controversy mapping and digital methods to do so, building on these methods’ respective actor-/issue-centricity and medium-specificity.

In this dissertation, I develop these research techniques through the analysis of the climate change controversy, an ongoing debate that takes place across scientific disciplines and into the public realm, across platforms, sources, and studies, from the first international climate skeptics
conference of 2008 all the way to 2015. When I started this research, the climate controversy was publicly understood as historic but hard to historicize, as it was being lived in real-time. It also experienced an upswing in debate temperature once skeptics began organizing themselves in these annual conferences, and as several publications rose in response to debunk their status and unveil skeptics’ entanglement with industry funding, especially tobacco and oil industries. Upon the date of completion of the research of the PhD, 198 countries have now signed the ‘Paris Agreement’ to cut back on CO2 emissions and perhaps turn the tide of climate change. With this dissertation, I do not aim to contribute to climate science, which is well outside of my area of expertise, but instead to offer a contribution to the study of online content by developing a networked content analysis of the climate controversy as it is specifically formatted and transformed by platforms and actors. The study accordingly follows the climate change debate in science, as well as on the web (and Google Web Search), in Wikipedia and in Twitter, and analyzes how content is networked there, in order to propose adaptive and sensitive research techniques appropriate to networked content analysis.

These research techniques draw from existing approaches and methods developed to study controversies and their actors (controversy analysis) and social and cultural issues with the web (digital methods). Controversy analysis gives direction to the study of controversy without the translation of actor language (Latour, 2005) into preset categories listed in a codebook. On the contrary, it makes a case for descriptive research and advises researchers to launch their inquiries “in medias res” (Latour, 2005, p. 27) and describe what they see. There is no single specific protocol, toolkit or methodological framework for controversy analysis, but there are “commandments” (Venturini, 2009, p. 260)
as well as “sources of uncertainty” (Latour, 2005, p. 27), publications, and an educational program at Sciences Po in Paris that provide many guidelines for the operationalization of the mapping of controversies. In my case studies, which analyze the climate change debate on the web, Wikipedia and Twitter, this leads me to describing the group formations (on the web) of climate actors, following actors across networked and forked articles about climate change and related topics (Wikipedia), and exploring and describing climate change co-hashtag networks in Twitter. Digital methods are developed at the educational program at the University of Amsterdam in close kinship to controversy mapping and provide concrete tools and methods for the study of web-based dynamics of social and cultural issues. Similar to controversy analysis and content analysis, digital methods put forward non-intrusive methods, views, aspirations and affiliations of issues and their actors, collecting its data from websites and social media activity.

The differences that I outline between content analysis as it was incepted, controversy mapping and digital methods, all with certain limitations, are reiterated throughout the dissertation. Krippendorff’s robust articulation of content analysis for a prior media age, conceptually acknowledges but strains methodologically, and tool-wise, to grapple with the networked qualities of online content, where issues, debates and actors may spread out or recur across platforms and other carriers. The addition of controversy analysis offers a research outlook to follow actors and describe the many viewpoints and stakeholders present in a debate, while being under-attentive to operationalizing this with regard to networked content by offering mapping methodologies that deal with digital media content. This is where digital methods come in, which offer tools to capture and analyze an issue through networked web content that otherwise are not available in content-driven com-
munication research. My main contribution here in this dissertation lies in the combination of these approaches that makes possible the content analysis of networked content.

Networked content analysis, as content analysis that is amended to suit online networked content, enables a researcher to jump in the middle of a controversy, follow actors and describe these actors’ viewpoints in the actors’ own words, employing digital methods to capture and analyze the substance of a debate across platforms. My proposition here is similar to Susan Herring’s 2010 study in so far as I also am interested in widening of the paradigm of content analysis with methods from adjoining scientific disciplines. However, while Herring regards content as contained in media documents, I argue that such a separation between content and its carrier cannot hold with networked content. Furthermore, tracing the discipline of content analysis backwards, I note that such a division between content and form or carrier is quite antithetical to the way that content analysis was originally conceived by Krippendorf. Nevertheless, Krippendorf’s formulations are pre-web. Understanding the technicities of the platforms that serve and co-produce content today entails studying platforms’ characteristics and identifying the queries or tools that are necessary to demarcate and analyze networked content. Studying platforms as socio-technical systems is of the utmost importance, as they are “increasingly embedded in our societies” (Lazer et al. 2014, p.1205). In this dissertation, I develop such a socio-technical perspective on the controversy surrounding climate change as presented and debated on the web.

Krippendorf in his foundational work stressed that it is one’s definition of what content is and how that is delimited that leads to specific kinds of analytical results. As we have seen with the analysis of web content in the various case studies, it is indeed this very refinement of
defining (the materiality of) content that, with the recognition of the technology as an active material agent and part of content, leads to specific demarcation of content online. As I argue in Chapter 2, the definition and demarcation of content has never been so straightforward in the case of offline materials, and changing technologies have further complicated these matters. The digitization also of analogue content has changed the nature of materials already, raising new questions regarding the inclusion of features and formatting in the analysis. With hyperlinks, content became networked and thus it became harder again to demarcate and to establish where so-called content ends. Search engines brought about new ways of presenting and ranking data, and platformization gives further shape to the far-stretching entanglement of social media with other web content (Helmond 2015). Network Content Analysis aims to be adaptive to the specific technicities of platform content; therefore, I approach the climate change debate on each platform with platform-specific ways to define and delineate the corpus to analyze. In my case study of the web, I demarcate sources, for instance by taking the speakers list from an international climate skepticism conference and looking up their respective websites to use for further research, and by taking the top results for the query “climate change” in various languages to measure the resonance of prominent actors. In the Wikipedia chapter, I discuss a study of climate change-related articles in which the demarcation occurs by taking those articles that are reciprocally linked from the climate change article. In the Twitter study, I demarcate tweets by a query that includes tweets containing climate change or global warming.

The inclusion of web content’s technicity into the idea of content

109 – ‘Reciprocal linking’ here means both linking to and receiving a link from the article on climate change.
itself then leads to analyses that make use of, and deal analytically with, these technical agents. The collection and analysis of web content that follows the specificities of each platform, and operationalizes the specific technicities at play, will lead to a more precise analysis, one that is sensitive to the networked nature and dynamical movement of online content. I realign my work with Krippendorff’s inceptive call to keep the content together with its carrier (or context), and accordingly propose that in networked content analysis, researchers include not only the carrier (e.g. the search engine result, the Wikipedia article, the tweet) but also the technicity thereof (e.g. the ranking of the search results, the editing history and content robots of the Wikipedia article, and the hashtags and retweets networking a collection of tweets) as part of their analytical approaches. This dissertation offers up new ways forward for content analysis approaches, methods, and techniques that are suitable for the study of online networked content. Rehabilitating the inceptive work of Krippendorff, the contemporary web-literate approach to networked content analysis that I demonstrate here remains open to all kinds of content and includes contents’ technicity as part of its research method.

**APPLICATIONS OF NETWORKED CONTENT ANALYSIS I: THE WEB**

In the first case study, I approach the climate controversy by assessing the positions and affiliations of its actors, starting at the time of the first international skeptics conference organized by the Heartland Institute in 2008. I analyze the networks of climate change debate actors (including the conference’s keynote speakers) using scientometric analysis, as well as techniques that I propose as being fruitful for networked con-
tent analysis. Namely, these are hyperlink analysis and search engine results resonance analysis, which I use to research the place and status of climate skepticism within both climate science and the climate change debate as it takes place beyond the scientific literature. I approach the networkedness of content through hyperlinks to analyze networks of association. Subsequently, by using Google Web Search (to many a dominant entry point to the web) to demarcate top sources for the query of climate change, the case study zooms in on climate change actors and their prominence, as identified by the search engine. Here, I ask how the technical logic of search might be used to measure such prominence of actors in a specific issue, in this case looking at the resonance of climate change scientists (both skeptical and non-skeptical) within a demarcated set of websites. I zoom in on a particularly heated moment of the debate in the Dutch context, immediately following a publication on the scientific consensus regarding climate change, published by the Royal Academy of Sciences of the Netherlands (KNAW, 2011).

Hyperlink analysis shows a distinct profile for the Dutch skeptics, who strongly associate themselves with the Anglo-American network that gathers at the Heartland conferences. Meanwhile non-skeptical scientists, those ‘climate-concerned’ if you will, show a much more heterogeneous network, with links to science, government, UN, Worldbank and mainstream media. Resonance analysis, in this case, shows less strong differences between skeptical and non-skeptical scientists, with both sets of actors resonating across sources, and coming in at the top and bottom of the search results. There are no sources that mention only the small sample of non-skeptical scientists without also mentioning the skeptics, but two sources that only give attention to skeptics. Lastly, through a close reading of the climate skeptics’ websites, I find that their ‘skeptical’ delegitimizing campaigns extend to
coverage of topics well outside of the realm of climate science (e.g. the health dangers of second-hand smoke). Paired together here, traditional scientometrics and techniques of networked content analysis offer a fine-grained picture of the status, group formation and issue commitments of climate change skeptics (compared to non-skeptical actors). While with scientometrics alone I have not been able to identify the skeptics as entirely separate from climate science as an academic field or inter-discipline, with networked content analysis I have found divergent networking behavior, as well as the aforementioned related issues, which qualified them more as professional skeptics rather than professional climate experts.

The main challenge that web-based media presents to traditional content analysis is that web content is networked, for instance by hyperlinks. Another way that it is linked and processed is through social media buttons, which pull the content of websites into various platforms (see also Helmond (2015)). Furthermore, the fact that web content is often accessed through search engines such as Google Web Search, which rank and suggest content through undisclosed and ever-evolving algorithms, is just as problematic (McMillan, 2000). Asking subsequently what kind of climate change debate the web puts forward through such search technicity, I would conclude from this case study that it demonstrates actor alignment in networks of affinity, association, critique (as the skeptics linking to their main object of criticism: IPCC), and aspiration (e.g. in the case study, Dutch skeptics are hyperlinking to their Anglo-American colleagues, who do not link back). Resonance analysis reveals on one level the sources present in the top results of a query, but also the mention such sources make of specific keywords, or, in this case actors. Close reading of these actors’ websites establishes the image of their professional skepticism, problematizing and delegit-
imizing the apparent professionalism of their commitment to climate change as an issue.

APPLICATIONS OF NETWORKED CONTENT ANALYSIS II: WIKIPEDIA

My second case study focuses on the climate change debate on Wikipedia, the most well known go-to online and free reference system on the web. Characterizing the project as a socio-technical platform for knowledge production in the encyclopedic format, in this chapter, I discuss the dependency of the platform, its various user groups, and its content, on the (underlying) technicity of Wikipedia. In its status as an encyclopedia, it seems initially counterintuitive to think of Wikipedia as a space to study controversy. However, due to the way Wikipedia content is networked, designed and managed, the platform has emerged to be recognized as a unique site for controversy mapping; this is because an online encyclopedic project is ever exposed as being ‘in the making.’ After discussing in detail the technicities and protocols of the Wikipedia project, I present two studies that each offered a close reading of a controversy that takes place behind the scenes of Wikipedia articles. I choose these specific studies and approaches in order to make a case for a networked content analysis that uses the (ever-evolving) technicity of this ubiquitous platform of Wikipedia in the analysis of a particularly contested and major controversial topic.

Subsequently, the networked content analysis of the climate change debate on Wikipedia by Gerlitz and Stevenson deploys the hyperlinks between articles on the topic of climate change to demarcate a network of related articles, which allows for the study of the composition of its editors (including active bots) as well as editing activity over time. Here,
networked content analysis permits a historical reconstruction of the debate, and indicated generic Wikipedia editing trends over time, but also recognizes issue attention cycles, where ‘new news’ around the controversy or debate has the effect of spiking Wikipedia activity across specific pages. Lastly, heat maps may be used to signal significant moments in Wikipedia’s ‘management’ of the issue of global warming, as I discuss extensively in the chapter. Here, the technicity of the platform formats content in a way that both its historicity and conditions of production (e.g. the talk pages) become visible to both users and researchers.

I am attentive here also to the periodization of research on Wikipedia, and its uptake by researchers as a tool. The first generation of scholarly Wikipedia research has focused mainly on the platform’s capacities for crowdsourcing knowledge production, as well as on the reliability of its co-produced content. I argue for more attention to the machinery that facilitates and formats this knowledge production. While traditional content analysis reaches its limits to struggle with the omnipresence of technical agents in the wiki-platform of Wikipedia, networked content analysis provides means to properly assess Wikipedia’s content, across articles and language versions. It can of course also still be used to compare web-based encyclopedia content to more static encyclopedia projects. All such potential research queries demand appropriate research frameworks and tools capable of capturing how Wikipedia is socio-technically modulated towards reliability and consensus over time.

\[^{110}\] These general trends include an overall increase of editing interventions over time, a relative decrease in activity in the months of June and December, and the existence of an incubation period between an article’s creation and its maturation, where after initial editing and a period of inactivity are followed by more regular editing.
In the final case study of Chapter 5, I study the state of the climate change debate in Twitter, which I commence by assessing the logic of this platform and how it networks and circulates its content. Here, I demarcate a set of climate change related tweets using a tool called TCAT, and query the set for the resonance of recognized keywords from various discourses within the climate change debate. I present the results of this so-called resonance analysis as discourse-specific keyword profiles, which allows for zooming in on the main actors and the main content circulating within this subset, providing insight in the different phases of the climate change debate. Importantly, and counter to practices of pattern recognition, close reading of the data proves necessary to further filter collected data towards improved relevance.

The early applications of traditional content analysis discussed in Chapter 2 stem from the pre-platform era. Thinking back to the warning issued by McMillan to researchers wanting to use search engines, we can imagine the hesitation to work with APIs, and the differences between free APIs (offering limited amounts of data) and real-time full access to data (as opposed to for instance Twitter’s ‘Firehose’ API), which often comes with a price tag. The main methodological contribution of this chapter is its development of a means to perform resonance analysis, where the demarcation of content (based on literature of input from subject-matter experts) provides a sample in which the resonance of actors or keywords can be mapped. Similarly, the demarcation of tweets visualized through hashtag clusters allows for a descriptive and exploratory analysis of the debate around climate vulnerability (Savage, 2009; Tukey, 1977). The hashtag cluster network, I argue, could be read as a time slice, presenting the status quo of an issue or debate. In the case of
climate change, this time slice does not merely state “what’s happening” but rather serves as a progress report or awareness system, addressing present challenges of climate change adaptation and what is at stake. The keyword profiles, on the other hand, enable a comparative view, which give insight into how the discourse has shifted from mitigation to adaptation, confirming the ‘adaptation turn,’ which has been declared in different realms. Furthermore, these methods enable a close-up study of the actors at the level of these distinct discourses. In this way, the Twitter study thus also underlines the persistent mutual interrelation between news media and platforms, whereby the platforms may produce news or act as a channel of distribution and amplification of content, sources and actors, which I will reflect upon further in this conclusion.

**FIVE KEY POINTS**

In this dissertation, I discuss different research techniques that I propose together as an integral starting point for a practice of networked content analysis. Some of these methods pre-exist my use of them for this purpose while others are methodologically amended tools and techniques of digital methods. I would like to rehearse five key points in this dissertation, which establish the need for such techniques. Firstly, the main goal of this dissertation is to develop an adaptive toolkit able to deal with the fact that different web platforms and engines serve content with different technicities. As each platform or engine has its own technicity and therefore requires specific methods and analytical tools, I try to stay true to the strengths of traditional content analysis for the humanities and social research—the non-intrusiveness of the method, the inclusion of
content in all its shapes and forms, and the attention to the context of content—while further developing techniques that better adapt to the specificities of networked content.

Secondly, I find it important to emphasize also in my conclusion that content currently exists in and through the platforms and engines that produce it, which means a clean separation of content from its carrier is no longer feasible. It is now impossible or, at least, unadvisable to regard a Wikipedia article as entirely separate from its publicly available production process. Who were the authors? Were there bots involved? What are being presented as related articles? Which sub-topics (of an entry on Wikipedia) have become their own dedicated articles? Which were forked as a means of controversy management? Answers to these questions are likely to be of great interest and utility to those invested in Content Analysis in a networked era, and to anyone embarking on the mapping of a contemporary debate. Krippendorff has laid the groundwork for such analysis, well prior to content analysis having to deal with online content.

A third point I want to underline is that networked content also folds in traditional media content. Television news is published online, discussed in websites; news reports and images populate search engine results, lead to the creation of Wikipedia articles, or are linked to by tweets and amplified by retweets. This leads to the entanglement of news (and other mass) media content, more traditional objects of study of content analysis, and networked content, the object of study in networked content analysis. The entangled nature of any media or content relation is where the focus and benefits of networked content analysis lie. In the Wikipedia study (of chapter 4) I mention how news events tend to cause heightened editing activity in related articles. In the Twitter case (of chapter 5), I discuss how Twitter as a micro-blogging
platform could be approached through more conventional news cycle analyses but also through “meme-tracking” (Leskovec et al., 2009). In the latter mode, Twitter as a micro-blog could then be seen as highly responsive to or even parasitical or imploding of conventional news ‘sites,’ echoing and amplifying news snippets by tweeting and retweeting. Further, as Twitter is often moving information faster than the news, Twitter content in some cases is news. Of course for these reasons, Twitter is a popular medium for professional journalists. They bind tweets to their story, and when their work has been published they may tweet a link to that article, using it as a channel for the distribution of their own work. As news and mass media sources strive to make their content “platform-ready,” a term by Helmond (2015), the entanglement of news, other mass media content and new platforms has entered the next level. Networked content analysis proposes to take this entanglement as a given and demarcate content through the logic of the platform (as developed in digital methods) and thus follow the actors across sources (as key to controversy analysis). The rise of digital media does not mean the end of traditional mass media, but its reconfiguration as part of online networked content.

Fourthly, and more conceptually, I would like to propose that when studying the climate change debate through online content, we may regard the different platforms as different windows on the debate. Rather than asking ‘What does Twitter say about the controversy,’ or critically asking ‘Who is on Twitter these days, anyway?’ or ‘Who uses hashtags?’ we may productively ask: ‘What kind of climate change debate does Twitter present?’ ‘And how does this compare and relate to the climate change debate as presented by Wikipedia (for example)?’ In the climate change case studies in this dissertation, the web presents a climate change debate maintained by professional skeptics with distinct net-
working behavior and related issues and specific controversy objects. Wikipedia offers a view on a successfully forked issue, where the debate had been taken out of the main article and the skeptical editors stayed true to the debate itself, migrating along to the new ‘debate-article’ established to address the controversy. Twitter presents a progress report of climate change adaptation, attentive to the landscapes and animal species endangered by climate change. In these ways, considering social media platforms as *windows on an issue* is also productive for creating a better understanding of the cultures of use of such platforms.

A fifth point worth mentioning is that while Wikipedia offers public views on its technicity, the other platforms studied in this dissertation do not. Google Web Search, through its terms of service, does not allow for the use of its search engine for anything other than search. So repurposing the engine as a research device (as discussed in detail by Weltevrede 2016) goes against its rules and regulations. Twitter has various APIs, however, on an interface level, Twitter disclose its mechanisms of ranking and prioritizing content (and neither does Google or any social media platform). This point was central to a critical project titled *The People’s Dashboard*, which I developed together with Esther Weltevrede, Erik Borra and others in 2015, and find relevant to mention briefly here.** The People’s Dashboard** is a social media platform plugin that visualizes the entanglement of content and users with the platform and its technicity. The dashboard is intended to be a critical layer on top of six different social media platforms: YouTube, Facebook, Twitter, LastFM, LinkedIn, and Instagram, in order to discover and highlight “people’s content” as a layer on top of the interface. The plugin, which

111 – *The People’s Dashboard* is described extensively on the wiki project page (Digital Methods Initiative, 2015b), and the team members are listed in the ‘Acknowledgements of co-authored articles’ section of this dissertation.
currently works for the interface of Facebook, color-codes interfaces of social media platforms according to whether it presents content of the people, or of the platform (Figure 18).

Figure 18: The People’s Dashboard. This mockup of the People’s Dashboard was developed during the Digital Methods Winter School of 2015, as a critical layer on top of the interfaces of dominant social media platform interfaces, revealing content of the people (pink) and of the platform (blue). Turquoise is mixed content, indicating that people’s content has been re-ordered or repurposed (e.g. Facebook News feed or birthday notifications). The plugin works with Facebook and is available on Github: http://bit.ly/peoplesdashboard (Digital Methods Initiative, 2015b).

The project tries to increase understanding around what is actually social on social media nowadays. For researchers, such an understanding stresses the necessity to regard technicity as omnipresent, and make
explicit how it is dealt with. This idea is recognized by scholars working with networked content such as Marres and Moats (2015), who, in a tradition of Science and Technology Studies (STS), call for a symmetrical approach to the study of controversies with social media content, in which there is as much attention to “media-technological dynamics” as there is to “issue dynamics” (Marres & Moats, 2015). Networked content analysis has a slightly different approach, as it proposes to include technicity by, straightforwardly, taking the networkedness of content into account. In the various case studies, I describe how platforms network content differently, and—as stressed in the first point—how this calls for an adaptive approach to the analysis of networked content, which is amendable to suit the technicity of a platform. Making technicity explicit in this way is comparative to the functionality of the People’s Dashboard, as it offers a view on the entanglement of user content with the platform.

I would like to conclude here that networked content analysis remains true to its roots in content analysis as an unobtrusive method, while adapting to the web through medium-specific digital methods and taking on the research outlook of controversy mapping as a means by which actors may be followed, viewpoints traced, and presumptions left behind, in order to capture the richness and specificities of actor language. As such, it combines the adaptability and medium-specificity of digital methods and the richness of controversy mapping with the rigor of content analysis. Networked content analysis, as proposed through these kinds of imbrications, will give renewed significance to modes and methods of content analysis appropriate in and for the digital era.
TECHNICITIES IN NEED OF ATTENTION?

In this dissertation, I discuss the technicity of web search and interlinked websites, Wikipedia articles and tweets. Of course, I have encountered many technicities beyond these that I did not discuss. Furthermore, there are many other platforms that could be studied in a networked content analysis of the climate change debate. One could analyze climate activism in a large social media platform like Facebook, or a smaller image-based platform such as Pinterest, or study websites of climate change initiatives in a specific geographic region. For each platform it is in any case crucial to ask questions that take into account the technicity of networked content: how is content networked in the platform and what kind of issue does the platform present?

Perhaps one technicity that remained especially under-discussed and under-visualized in the maps is geo-location. And it is this question of place, as an important technical aspect of networked content, which brings me to address the relationship between my thesis’ proposed approaches and the directions and implications it has for future research. In the case studies, I map the major controversy of climate change, not by visualizing viewpoints on a traditional geographical map, but by tracing actors and (sub-) issues across online platforms. I discuss how platforms and engines such as Google Web Search enable researchers to focus on a national or language-specific content space, for instance in the study of Dutch climate change skeptics (in Chapter 3) in the comparison of language versions of a Wikipedia article (as discussed in Chapter 4), and through mention made of places in Twitter hashtag clusters (as described in Chapter 5). However, there are other ways in which content is geo-located (or geo-tagged) on platforms. There are social media platforms that are based centrally on the utility of geo-lo-
cation, such as Foursquare, a service that allows for ‘checking in’ on a specific location and thus sharing where you are with your followers, or Instagram, which offers the possibility to give your photo a geo-tag and is for this reason an app often used to share pictures of hotspots in specific places. Here again, social media can offer a lens or window to a specific place, and it could be interesting and productive to ask not only what kind of place is this, but also what kinds of mediations of such places, do specific platforms put forward.

As an example outside of my focus on climate change, in a study of the city of Amsterdam through social media data, our work at the Digital Methods initiative recently found that Instagram offers a collected ‘boutique view’ on the city, while meetup.com (a platform for organizing social gatherings) highlights the ‘tech’ and ‘sports’ venues of the city of Amsterdam. This connects to the work of Barrechene (2012), in which he discusses the inscription of place in location-enabled platforms. For the case study of my dissertation, this means I could select in the Twitter dataset only the geo-demarcated tweets, or instead look at user profiles and only select those that state a location. This way, I could research how the state of the debate differs across geo-locations by looking at the origin of a tweet or of the Twitter user (profile). On a methodological level, I could assess the possibilities and limitations of studying place through networked content analysis, assessing how different platforms deal differently with the demarcation of place.

..............

112 – The layered interactive map is available on: http://bit.ly/amsterdamcartodb, the project page is on the Digital Methods Initiative wiki. Its project page can be found at: https://wiki.digitalmethods.net/Dmi/TheCityAsInterface.

113 – A project that explicitly deals with these questions is The Knowledge Mile Atlas, in which I am working with information designers to create an atlas of a small urban area in Amsterdam. Here, we represent different online data sets of a geographic
As other technicities add layers to the analysis of an issue or debate, the diversity of content types included in such a ‘layered’ networked content analysis adds complexity to the analysis. Here, we can learn from controversy mapping, whose scholars have warned against the creation of an all-encompassing ‘mother map’ that includes all actors, viewpoints and sources of a certain debate as seen from above (Venturini 2009, 2011). As there is no above in controversy mapping, these layers should not be used to create a summary but rather treated as separate mappings, in which each offers a detailed window through which we can navigate a debate in all its richness (Venturini, 2011).

In my dissertation, networked content analysis is developed to study the climate change debate, a controversy that takes place in science and well beyond, in news media and public debates, and echoing complexly across online platforms. While this dissertation has put forward several research techniques, the example of geo-location indicates that further research will only lead to more material for the content analyst who wants to use networked content for researching debates and controversy. Furthermore, it underlines the need for a more thorough un-

area, by using different methods of geo-demarcation, data analysis and visualization. First, by geo-locating addresses coming from administrative databases, we showed the density of and the connections between companies registered in the area. Secondly, using natively digital geo-coded objects, such as Foursquare checkins and geotagged photos, we layered the social media view of the area. Finally, querying street names in the dominant search engine, we collected the online image of each street. Each layer offered a methodological exercise in rethinking geo-location based on the specificity of each platform and the technicity of its content. What is relevant in such methods is the ability to layer the online activity on top of the map of the actual geo-location. The Knowledge Mile maps show the online presence and resonance of an urban area under development in Amsterdam that cuts through the city center and crosses many district and neighborhood ‘borders’ (Niederer, Colombo, Mauri, & Azzi, 2015b).
derstanding of technicity of content and the adaptive analytical attitude researchers of online networked content need to develop.

THE FUTURE OF CONTENT: CHALLENGES FOR FURTHER RESEARCH

The biggest challenge for researchers who want to work with networked content may be the multifariousness of content types, data sources, and technicities, which, in order to be compared need to somehow be comparable. Here, it is useful to consider how both controversy mapping and digital methods approach this issue. Controversy analysis does not strive for a clean objective picture to arise from the analysis of complex issues and debates. Rather than striving for objectivity, controversy analysis tries to reach what Latour calls “second-degree objectivity” which is “the effort to consider as much subjectivity as possible. Unlike first-degree objectivity, which defines a situation of collective agreement, second-degree objectivity is attained by revealing the full extent of actors’ disagreement and is thereby typical of controversial settings” (Venturini, 2010, p. 270). In second-degree objectivity, it is not necessary to normalize or objectify content in order to make it comparable. Instead, it is the wide array of viewpoints, actors and sources that build a cartography that Latour himself describes to his students as “observing and describing” (Venturini, 2010, p. 270). As controversy mapping does not offer an operationalization of this approach, let alone how to apply it to networked content, it is useful here to look at digital methods for “cross-platform analysis” (Digital Methods Initiative, 2015a).

Digital methods have proposed three approaches to cross-platform analysis, which are strongly related to the methodological difficulties discussed of disentangling content from online platforms. The first ap-
approach can be summed up as *medium research*, and takes as a point of departure the question of what the platform does to the content. How does the platform rank, obfuscate or amplify specific content, and what do we know of its cultures of use? A second approach is that of *social research*. Here, platform technicities are not included in the study, as the researcher focuses on the story told by the content. A third approach is the combination of the two, asking both what the platform does to the content and what stories does the content tell (Digital Methods Initiative, 2015a). This approach would be most suitable to Networked content analysis, where we could explicitly add how the platforms network content, and how content is “inter-linked, inter-liked and inter-hashtagged” (Digital Methods Initiative, 2015a). However, noting the size of data sets and the necessity of close reading, the scaling up of such methods remains a challenge, which is dealt with by various scholarly fields (ranging from humanities to data science).

The comparability of content from different platforms and the web also becomes an issue in its visualization, or more specifically in its side-by-side representation in dashboards. As analysts, activists and decision-makers increasingly make use of dashboards, there is increased urgency to developing critical dashboards, as I alluded to in my mentioning of the *People’s Dashboard*. A critical dashboard would show the technicity of content and explain what is left out, what is foregrounded, and what is being amplified by the logic of the platform.

In the preface to his 2010 manifesto *You are not a gadget*, Jaron Lanier writes:

\[\text{\ldots\ldots\ldots}\]

---

114 – In networked content analysis, this would be explicitly: ‘how does the platform network content?’
It is early in the twenty-first century, and that means that these words will mostly be read by nonpersons – automatons or numb mobs composed of people who are no longer acting as individuals. The words will be minced into atomized search-engine keywords within industrial cloud computing facilities located in remote, often secret locations around the world. They will be copied millions of times by algorithms designed to send an advertisement to some person somewhere who happens to resonate with some fragment of what I say (Lanier, 2010, p. xiii).

The future of content presented by Lanier, as material increasingly intertwined with its carriers and platforms, is a future of content networked to the extreme. We will find content made for the network, rehashed, redistributed and copied by network infrastructure, and then clicked on, liked or retweeted by its recipients. The future of content then is content that is written for exponentially networked technicity. As content will evolve along with the technicity of its medium, researchers will have to expand the techniques and tools for networked content analysis, continue to develop a critical vocabulary, and produce further concepts and visual languages for the mapping, analysis and description of networked content.