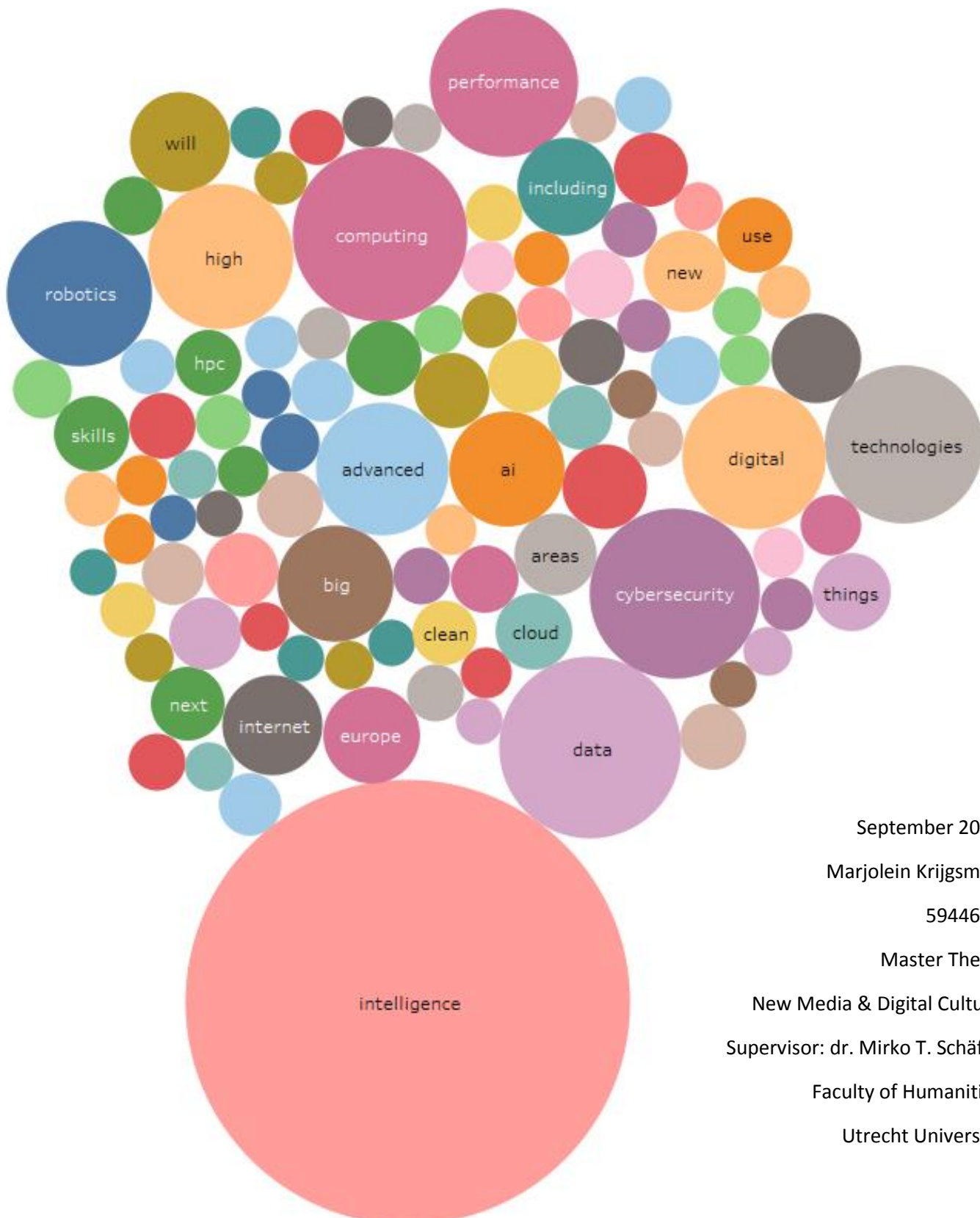


The Language of the European Union on Artificial intelligence:

A distant reading of the rhetoric on Artificial Intelligence in the European Union's online publications



September 2018

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Master Thesis

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Preface

As some of you might have noticed immediately, the title of this thesis is a clear reference to Moretti and Pestre's "Bankspeak" article from 2015. This article has inspired me to dive into the realm of quantitative text analysis, aided by computational tools. The visualisation on the front page of this thesis represents the words in the total corpus with the highest frequency. In combination with the title, it shows to some extent what my research is about: the quantification of EU's publications on Artificial Intelligence, or zooming out. However as will be evident early on, my research is not solely quantitative.

I would furthermore like to take the opportunity here to thank several people who supported me during the writing process of this Master thesis. First of all, my supervisor dr. Mirko Schäfer for his thoughtful insights and feedback. Furthermore, several people of the Utrecht Data School with whom I often discussed my thesis and who could always help me to get my focus back on track. 2018 has been an eventful year for me, with ups and downs, but your support, understanding and insights helped me through it. And last but certainly not least, I would like to thank my fellow students, friends and family for their love, feedback and most of all their support.

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1. Abstract

In light of the recently published Artificial Intelligence strategy for Europe and the European Union's claim of focusing on innovation and legal and ethical frameworks, this study examined the rhetoric of the European government on Artificial intelligence in 361 of their online publications that available on EUR-Lex (from the timeframe of 1977 to 2018). By drawing from an approach grounded in the Digital Humanities and literary history studies, this study employed distant reading through quantification and text mining of the corpus with the software tool AntConc. This explorative approach was selected for its ability to examine patterns, temporal transformations and outliers within large corpora, ultimately with the goal to finding themes within the corpus. Additionally, by further examining the results within AntConc and Tableau using a close reading approach, which is supported by a theoretical framework on imaginaries, framing theory and discourse metaphors, it was found that Artificial Intelligence is mainly referred to in these publications as an emerging and innovative technology, which is considered to be the key to finding a solution to the problems within the European society. AI is largely connotated with positive rather than negatively implications and AI is frequently found in proximity of other emerging or supposedly new technologies. The publications analysed contain only a few mentions of possible risks or challenges of AI, suggesting a mainly optimistic view on AI by the European government. Potential discourse metaphors have been observed within the corpus. Lastly, the methodological challenges of using a distant reading approach are discussed.

Keywords: Artificial Intelligence, Distant Reading, Text Mining, European Discourse, Digital Humanities, Sociotechnological Imaginaries, Discourse Metaphors, Framing

2. Introduction

In April 2018 the European Commission published their Artificial Intelligence (AI) strategy for Europe, in which they aim to boost Europe's AI research and innovation, while preparing for these innovations on a socio-economical level with new legal and ethical frameworks. The European Commission suggests the emphasis lies on ethical aspects (European Commission 2018a). In the political strategy by the European Political Strategy Centre (EPSC), they even take into consideration prospective dangers of AI, citing sources such as the initiative of Stop Killer Robots and the 2015 Petition against autonomous weapons signed by the world's leading AI and Robotics researchers (Future of Life Institute 2015). Such outings are a clear example of the concern of possible dystopian scenarios that may arise parallel to AI innovations. On the contrary, Robotics Engineer Rodney Brooks argues that people's views on AI are too dystopian, stating "Mistaken predictions lead to fears of things that are not going to happen" (Brooks 2017).

The development of new or improved AI technologies is generally accompanied by a discourse on these new technologies (boyd and Crawford 2012, 664). The examples given above show different perspectives of AI exist, ranging from utopian to dystopian and somewhere in between. These perspectives can be examined through the lens of a technological imaginary, which has got many different definitions throughout the years, however is roughly defined as a longing for new technologies as opposed to old or existing inadequate technologies, which are considered an ultimate solution to a variety of problems in a society. In this, the technological imaginaries are not only shaped and sustained through a specific discourse, but is moreover part of the active process of technological innovation and policymaking (Flichy 2004, 10-11; Flichy 2007, 209; Jasanoff and Kim 2009, 123). Importantly, this also includes "warn against risks or hazard that might accompany innovation if it is pushed too hard of fast" (Jasanoff and Kim 2009, 123), which refers to more dystopian views on the advancement of technological innovation. It is because imaginaries are not only shaped by the media through their so-called discursive frames, but are also inherently part of the innovation and policymaking processes as is argued by Jasanoff and Kim, that governmental institutes play an important role in the creation and perseverance of imaginaries. Imaginaries and rhetoric are part of the discourse and can ultimately determine which views are considered dominant in a society.

Just like the buzzword Big Data, the term "AI" has certain connotations and is closely linked to various imaginaries, fed by popular culture and media narratives. The term AI itself is even dubbed as the "new Big Data" in some circles, as the two technologies seem to be perpetually connected. These imaginaries of AI are shaping our social, economic and political spheres according to Elish and boyd (2017, 1-2). As such, technologies like AI and Big Data can be seen as socio-technical

phenomena¹ whose assumptions and biases should be critically inquired (boyd and Crawford 2012, 663) and whose context of development and usage should be studied thoroughly (Elish and boyd 2017, 2). Moreover, these socio-technical concepts can trigger both utopian and dystopian rhetoric (boyd and Crawford 2012, 664). It is my intention within this study, to examine the rhetoric of AI used by the European Union in their online publications from the EUR-Lex that mention “Artificial Intelligence” specifically. I specifically focus on the processes as seen on the political and government level of the European Union as Jasanoff and Kim deem these policy-making processes crucial for the existence of sociotechnological imaginaries (2009, 123). A way to examine this rhetoric is by zooming out, approaching it via distant reading. The central question throughout therefor this paper is:

What does a distant reading of online official European government documents addressing Artificial Intelligence reveal about the European government’s rhetoric on Artificial Intelligence?

I consider this research to be highly explorative in nature, as I aim to examine how Artificial Intelligence is framed within a large database of European publications. Into answering my main question, I first examine the rhetoric on Artificial Intelligence used by the European government in its online publications more generally. This is done by using a distant reading approach based on Franco Moretti (2000), which is grounded in study of literary history. Using the text mining tool AntConc, I initially use a means of quantitative analysis. Secondly, I examine this rhetoric into closer detail through the lens of a framework about imaginaries, framing and metaphors. I furthermore take into account the existing historical applications and cultural perspectives of AI. Even though this study is mostly quantitative, this combined approach of distant and close reading, allows me to examine the corpus on not only a linguistic level, however furthermore enables looking for distinct patterns and outliers (or the absence thereof) and themes throughout, and examine them in detail with the help of my constructed theoretical framework. I thus tackle these questions using a distant reading and close reading approach and by conducting text mining on the corpus. I have gathered a corpus of 361 EU online publications from the EUR-Lex. First, as this corpus is quite sizeable, text mining using digital tools is used to examine word frequencies. Interesting word patterns and uses are then more closely examined in their textual context by employing the concordance tool and collocates tool of the AntConc software application.

¹ In Science and Technology Studies (STS), socio-technical systems are infrastructures within society that are concerned with human interaction with machines and organisational factors. “The underlying premise of socio-technical thinking is that systems design should be a process that takes into account both social and technical factors that influence the functionality and usage of computer-based systems”, thus indicating a socio-technical relationship (Baxter and Sommerville 2011, 4-5).

Additionally, Moretti and Pestre have conducted a quantitative linguistic analysis to study the “operations and outlook of the international financial institutions” (2015, 75) in which they gained insights in the language used by these institutions. Even though such analysis might suggest it is solely quantitative, they have shown that by taking a closer look to the specific textual context of certain words and comparing them to historical contexts, financial institutes have a certain rhetoric. Therefore, I argue that distant reading can gain much from a close reading approach, which I will more in detail further in chapter 4.1.

According to Elish and boyd “These new phenomena [AI and Big Data] must be taken seriously and interrogated not only as modes of adjudicating in the world, but also and in their very essence, modes of *knowing* about the world” (2017, 18), their epistemological challenges thus should be studied as well. When considering modes of knowing about the world, I consider not only academic research as crucial, political and cultural processes are of importance as well. Gillespie argues to be able to understand the impact of AI technologies (i.e. machine learning algorithms), we need not to study only AI and their workings or developments, but instead also its discourse (2014, 25) in political context. With regard to research done in the field of Science and Technology Studies (STS), Jasanoff and Kim argue:

STS scholarship, however, has devoted substantially more attention to the products of scientific disciplines, labs, clinics, and other professionally bounded spaces than to the promotion and reception of science and technology (S&T) by non-scientific actors and institutions. One result is that the relationship of science and technology to political institutions has tended to remain undertheorized. Even in highly political environments, STS research tends to be drawn to scientific and technological innovation as an end in itself, in preference to more complex relationships among knowledge, its applications, and power (2009, 120).

They call upon scholars to take into consideration the non-scientific actors and institutions when examining science and technology, and specifically mention the under theorisation of the relationship of technology to political institutions. With this research, my aim is to answer to this call, using an approach grounded in the Humanities rather than STS to study the technology of Artificial Intelligence. As Jasanoff and Kim voice the need for examining knowledge applications and power, a Humanities point of view is certainly not superfluous. Likewise, Frank Fischer argues that the study of public policies needs a more discursive approach which addresses power mechanics, social values and meanings and lead towards examining policy in its societal and cultural context (2003, viii-x). To answer to this call, I therefor employ a combined method, as a purely quantitative method would not be able to address these contexts.

I distinguish myself moreover by examining many publications published over such a long timeframe, starting from the first ever published document on the EUR-Lex archive. Relevant to my study, but with a different focus and approach, Nick Couldry and Jun Yu have studied the “naturalization of personal data collection” in general discourses of data within the reports of economic institutions, consultancy firms, European and US government reports and the specific discourses of health and education sectors within public discourse of corporations and research institutes (2018, 6). Their approach relies on the deconstruction of those discourses, making use of the principles of traditional discourse analysis. The authors selected texts they deem relevant to the discourse beforehand. Likewise, Loizos Heracleous and Laura Klaering have studied Steve Job’s rhetoric by selecting three texts, analysing them by means of discourse and rhetorical analysis (2014). Likewise, the article by Simone Natale and Andrea Ballatore called “Imagining the thinking machine: technological myths and the rise of artificial intelligence” has been a profound inspiration for my research. Here, the authors examine the discourse surrounding AI technologies by framing these technologies as technological myths, analysing the notion of AI as being perceived as thinking machines (2017). They conducted this research based on articles about AI in two scientific magazines (based in US, UK and Australia), preselecting 100 articles per magazine for a close reading (the articles occur in a time span of 1950 to 1975). However, I believe it could also be relevant to examine Artificial Intelligence by taking an even broader view and by expanding the time frame of the analysis. In this sense, the wider timeframe of my study on the rhetoric of Artificial Intelligence gives new insights in the temporal changes in the rhetoric on AI. Even though the EU publications are also preselected on their mention of “Artificial Intelligence” (although using the EUR-Lex search function itself), I do not make a distinction between relevant or irrelevant texts. I take all 361 texts into account. My research is led by the corpus, rather than any premature hypotheses I might have, which ultimately makes it explorative and inductive.

By means of giving guidance to the reader, I will shortly elaborate on the structure of this thesis. In the following chapter, I discuss in detail various concepts which constitute the theoretical framework of my thesis (Chapter 3), related to imaginaries, discursive framing and metaphors. However, I start with a discussion on the applications and perspectives on AI. Chapter 4 is dedicated to my methodology. In this chapter I elaborate on the approaches I used to analyse the EU publications (distant and close reading). Furthermore, I discuss my corpus in detail, as well as tools I used to analyse and visualise (AntConc and Tableau). In Chapter 5 I discuss my findings of the analysis and its connection to the theoretical framework as elaborated on in Chapter 3. Chapter 6 is dedicated to the conclusion of my research and a discussion on the methodological challenges of distant reading.

3. Perspectives on Emerging Technologies

In this section I first provide a short historical overview of Artificial Intelligence, discussing briefly the history of AI and the problems with using AI as an umbrella definition (as there are various fields and many different applications of AI). I furthermore discuss various cultural perspectives on AI.

Secondly, I elaborate on various concepts that relate to the understanding and representation of socio-technical phenomena within society, drawing from a theoretical framework of imaginaries, frames and metaphors.

3.1 Artificial Intelligence: Historical Applications and Cultural Perspectives

Defining and explaining Artificial Intelligence is not straightforward by any means. According to Elish and boyd there is no set definition as the concept is decades old and often contested in various disciplines (2017, 3). They furthermore argue the contemporary discourses about AI are not necessarily focused on the actual technical functionalities, but more on the potentials of AI in the future (ibid., 6). In Computer Sciences, the term AI is mostly used to describe Logic and Perceptron based techniques, or “Intelligent Systems” (Kotsiantis et al. 2007), of which Machine Learning is considered a technique. The terms AI and Machine Learning are often used interchangeably, which raises confusion among people and scholars. However, AI is much older than one would think, originating back to the 1950s. It brought together “the latest advances in the “system sciences” (Mindell, 1998), including cybernetics, information theory, systems theory, and cognitive science, researchers during this time predicted rapid advancements in solving “the artificial intelligence problem” (McCarthy, Minsky, Rochester, & Shannon, 1955)” (in Elish and boyd 2017, 4). Lister et al. argue there are two main approaches to AI: Classical AI and Connectionist AI. The former “is concerned to imitate human intelligence in machines” and the latter is “concerned to bring about machine intelligence regardless of whether or not it resembles human intelligence” (2009, 372).

Within the branches of AI, one can find Robotics, as well as Cybernetics, Neural Networks and Expert Systems (also called “Knowledge Systems” or “Knowledge-based systems”) (ibid., 4-5). As AI has so many branches, a single definition is not possible. Therefore, within the scope of this research, I analyse not solely based on the word Artificial Intelligence, but I take into account other definitions and branches as well. Expert Systems are considered to be part of the Classical AI. These systems emulate human reasoning and skill to help with decision-making processes (Lister et al. 2009, 373). The knowledge-based systems were proliferating in the 1970s and 1980s (Elish and boyd 2017, 5).

Contrarily, Neural Networks are considered part of Connectionist AI, which is concerned with building models that are similar to the brain’s physical functions and its ability to learn: “In the jargon, classical AI is ‘top-down’, in that it imposes a program on the machine; connectionist AI is ‘bottom-up’, in that it wants the machine to ‘grow’ intelligence” (Lister et al. 2009, 374). Machine

learning, for example, can be considered a learning technique in the field of computer science and AI, and is defined as the ability for an algorithm to learn from data without being explicitly programmed and to make informed decisions. Machine learning combined with large datasets can accomplish algorithmic calculations faster than a human because of the availability of increased computer power (Elish and boyd 2017, 4-6). Machine learning thus is simply an automated process to make decisions based on data and can be considered a branch of AI (Kitchin 2014, 103). Not surprisingly, AI is closely related to Big Data, and even sometimes called “the New Big Data” (Elish and boyd 2017, 2). Consequently, the vast application of techniques such as machine learning and deep learning (considered a ‘rebranding’ of neural networks) within computer science, Big Data practices and even games, presidential elections, social networks create a renewed attention for AI applications (ibid., 5-11), but I would say, also its ethical considerations.

Within the scope of this research, it is important to think of the rhetoric and cultural determined perspectives associated with AI. The business community hypes and shapes the rhetoric on AI as new AI technologies are being developed, often containing unrealistic, sci-fi-like and hyped cultural imaginaries and unreachable promises and possibilities (Elish and boyd 2017, 2, 5). In the late 2015, large companies tried to differentiate themselves from the Big Data hype and began renaming their algorithmic machine learning as “AI” (ibid., 4), consequently representing AI as a new and emerging technology.

Concerning the visual representation of AI, AI is mainly depicted as a machine or computer, often containing human characteristics in popular culture depictions. Elish and boyd state the imaginaries of AI “always waiver between the real and the imaginary” (2017, 6), combining the what-is-known to imaginaries and giving machines human-like activities. AI in popular culture may take the forms of super-intelligent (killer) robots, cyborg humanoid figures (Barbrook 2007, 151; Brooks 2017) and even all-knowing assistants on mobile devices (Elish and boyd 2017, 6-7) such as Cortana or Siri. These are not only based on imaginations but incorporate inherently human characteristics.

In their research, Natale and Ballatore conclude that the technological myths of AI prevalent in the 1950s to 1970s often address notions of transcendence within the ideas of transhumanism (2017, 11-12). It was found that the construction of AI myths is based on three patterns. First, “the recurrence of analogies and discursive shifts, by which ideas and concepts from other fields were employed to describe the functioning of AI technologies. Second, “a rhetorical use of the future, imagining that present shortcomings and limitations will shortly be overcome” and the third pattern addresses the “the relevance of controversies” (ibid., 1). They furthermore argue these notions are still influential within the contemporary and future versions of AI, stating “the rhetorical shift form the examination of present state towards the imagination of future horizons and developments still

characterizes contemporary AI myths” (ibid., 12). That is, the contemporary views on AI are still informed by the discourse and research on AI from the 1940s to 1970s. Natale and Ballatore define technological myths based on two scholars’ definitions. First, based on the definition given by information scientist Hamid Ekbia, as “embodiment of a dream – a kind of dream that stimulates inquiry, drives action, and invites commitment, not necessarily an illusion or mere fantasy” (quoted in Natale & Ballatore 2017, 3). Second, based on Vincent Mosco’s definition: “myths are stories that animate individuals and society by providing paths to transcendence that lift people out of the banality of everyday life” (ibid.). I believe their understanding of technological myths connect closely to the idea of sociotechnological imaginaries, a concept I will discuss in detail next.

3.2 Understanding Socio-technical Phenomena: Imaginaries, Frames and Metaphors

To get an understanding of how we can critically reflect on the rhetoric and perceptions on emerging technologies (of which Artificial Intelligence is but one of them) and how they play a role into transforming and constructing the social, cultural, economic and political elements of society, I want to start by discussing various core concepts. Elish and boyd argue regarding socio-technical phenomena that “the logics, techniques, and uses of these technologies can never be separated from their specific social perceptions and contexts of development and use” (2017, 2). To study the construction of emerging phenomena such as AI, we need not only to consider the specific applications of a technology, but also its role in the social and political dimensions of society and the discourse or rhetoric that surrounds it. That is, perceptions on socio-technical phenomena within society vary depending on their societal context and also strongly relate the context of development and innovation within a society. Therefore, I want to take the opportunity here to discuss imaginaries, frames and metaphors and furthermore, reflect on how they are intertwined. That is: how can (seemingly) new technologies be presented and how does it determine our perception on their possibilities and consequently, maybe even our actions?

3.2.1 Sociotechnical imaginaries

A concept that may help to better understand the connection between technology and the social perceptions and context of development is through the idea of imaginaries, which finds its roots in Lacan’s psychoanalytic theory, in which it refers to a “realm of images, representations and ideas” that link to the human desire to complete their incomplete selves (Lister et al. 2009, 67). It has however often been put in other contexts, such as that of the study of culture and technology or sociology. Sociologist Patrice Flichy has for instance discussed the concept of an “internet imaginaire” (Flichy 2004; 2007). He describes an imaginaire as a long-term collective vision which is constructed

through discourse (Flichy 2007, 4, 7). According to Flichy, his study of the technical imaginaire shows that it ultimately has two functions: “building the identity of a social group or society, and providing resources that can be reinvested directly in the preparation of implementation of projects” (2007, 208). The former could relate the perceptions of a socio-technical phenomenon within society, the latter addresses the context of development: how are these technologies developed, what informs them and how do they ultimately form a course of action (in the form of a project for example)?

Imaginaries when applied specifically to the context of technology or new media, often named *technological imaginaries*, draw “attention to the way that dissatisfaction with social reality and desires for a better society are projected onto technologies as capable of delivering a potential realm of completeness” (Lister et al. 2009, 67). As such, the psychoanalytic influence of completeness or wholeness shines through in this definition. It furthermore becomes interesting when linked to a form of utopian or dystopian discourse on technological advancements. It is possible that the fascination with AI can be clarified through the concept of a such a technological imaginary. New technologies are, as opposed to old existing technologies are considered inadequate, viewed as an ultimate solution to the social and technological problems in a society. According to Imar de Vries we strive towards a feeling of wholeness and project this upon technological advancements to ultimately complete ourselves (de Vries 2012, 166), in which we can recognise the influence here of Lacan’s psychoanalytic theory. Technological imaginaries can be considered collective instead of solely individualistic and we project both our desires *and* fears upon these emerging technologies. Imaginaries are also often associated with myths, for example by DeLashmutt, who argues the power of technology is imaginative and that we should examine technology in relation to fantasies, imaginings and myths related to these new technologies (2006, 11). When conceptualising AI in terms of the technological imaginary, the rhetoric may be informed by utopian and dystopian ideas, constructed through long-standing cultural imaginaries of science fiction-like machines based on their imagined highly fantasied potential (Elish and boyd 2017, 6). The business community (ibid., 2) and popular media (ibid., 6; Couldry 2017, 236, Lister et al. 2009, 68) contribute to the construction of imaginaries and myth-building. Robotics Engineer Rodney Brooks argues, with respect to AI, “Mistaken predictions leads to fears of things that are not going to happen” and we should “Watch out for arguments about future technology that is magical” (2017, N.p.). He debunks some of the most common heard fears or mistaken beliefs on AI and warns quite literally people should not believe in magical fantasies about it, which are constructed through imaginaries and discursive frames. However, imaginaries do not only apply to the social or public domain. They can, and often will, find their way into the political domain and its policy-making processes. For instance, when given enough attention by the media to their fears or a technologies’ possibilities for innovation. Other reconceptualisations of imaginaries are done with respect to the

fast emergence of technologies, such as algorithms (algorithmic imaginary)², or regarding national policymaking processes, which I will elaborate on a bit more.

According to Jasanoff and Kim, imaginaries can be viewed as both social and technological, which they have named “sociotechnical imaginaries”. In their Science and Technology Studies (STS) article on imaginaries that are found during the Nuclear War in Korea and the United States, they define the “national sociotechnical imaginaries” as “Collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects” (Jasanoff and Kim 2009, 120). This entails moreover policy making and technological advancement and processes. Imaginaries are both “instrumental and futuristic” (ibid., 123) as they create visions of the good and “warn against risks or hazard that might accompany innovation if it is pushed too hard or fast” (ibid., 123). The most prominent, dominant imaginaries often also help to guide active policymaking by government institutions. Importantly, Jasanoff and Kim make a distinction between media packages and imaginaries. The former are discursive frames or “narratives” that are constantly repeated by the media to influence public opinion, whereas imaginaries create a course of action on political or corporate level (ibid., 123). Imaginaries fuel the direction of technological innovation, they “operate for us in the understudied regions between imagination and action, between discourse and decision, and between inchoate public opinion and instrumental state policy” (ibid., 123), that is, they concern society’s infrastructures (on both a technical and procedural level) and human social behaviour. Similarly, Flichy argues the technological imaginary is inherently part of the processes of technological innovation and cannot be reduced to simply a public debate or a rhetoric (Flichy 2004, 10-11; Flichy 2007, 209).

Sociotechnological imaginaries are therefore highly political in nature, as they concern policy-making processes and “are associated with active exercises of state power, such as the selection of development priorities, the allocation of funds, the investment in material infrastructures, and the acceptance or suppression of political dissent.” (Jasanoff and Kim 2009, 123). In examining such political processes, one should therefore not only examine media frames and the public discourse, but the locations of political processes themselves. The selection of innovation processes, the allocation of funds and investments in infrastructures of technologies of a country are listed in a government’s official publications. It makes sense to examine these more closely when discussing

² A more recent (re)conceptualisation of the imaginary related to algorithms specifically, is the so-called algorithmic imaginary. This is a term coined by media scholar Tania Bucher in 2017. In her research on Facebook, she shows that the ways of thinking about algorithms, specifically what they are, how they are implemented and how they work could lead to different behaviour. According to Bucher, algorithms are “affecting not just what people think about the systems they interact with on daily basis but [...] how different ways of thinking about what algorithms are and do may affect how these systems are used” (2017, 32). In this sense, the imaginary determines human behaviour when interacting with the algorithmic systems.

and studying sociotechnological imaginaries. As these sociotechnological imaginaries are highly dynamic and cannot be considered so-called “static systems” (ibid.) but are formed throughout a longer period, it additionally makes sense to study their temporal transformations.

3.2.2 Frames and metaphors

However as argued earlier, the discursive framing of technologies by media and other (non-)government actors are also an influential factor. Within Media Studies, traditional communication theories such as the Gatekeeping theory, two-step flow model, and Stuart Hall’s notion of Encoding/Decoding theorise the processes of communication and perception. The notion of framing in its most basic sense as defined by William Gamson, “is a “spotlight” that attracts our attention to certain aspects of an issue, and directs it away from other aspects” (in Hänggeli & Kriesi 2010, 142). Within Media Studies, the Gatekeeping theory for instance draws on the assumption of filtering: information is filtered by the (mass) media and then perceived that way by an audience (Van Dijck and Poell 2013, 4). Gatekeeping, “the process through which information about political (and other) events is selected, shaped, and distributed by both journalists and social media commentators, the information going to both audiences and individuals” (Shoemaker and Riccio, 2016, 1), relates to this idea of filtering and can be considered information control (Barzilai-Nahon 2008, 1493). Traditionally, the agenda-setting theory has been widely discussed and seen as the starting point of decision-making processes (Princen 2018, 535), in which the ‘agenda’ is a set of issues that receive attention by the media and/or politicians (ibid., 536). These actors set the agenda and a specific rhetoric (using various rhetorical strategies) may accompany it.

Rhetoric in the Aristotelian sense is understood as a spoken act used to convince or persuade (Aristotle 2000, 2). Often within a political context this is done by political leaders through rhetorical strategies such as framing, the use of metaphors and central themes (Heracleous & Klaering 2014, 132-135). Rhetoric thus can have various shapes: spoken language, written language, metaphors or figures of speech, gestures and performances (Dryzek 2010, 320) and maybe even actions. Media scholar Mirko T. Schäfer argues ideological connotations and the framing of new technologies can be examined through an objects’ technical and discursive affordances. On a discursive level this means the research should be enriched by examining “Political statements, policies, corporate whitepapers, artwork, advertising and even metaphors” (2011, 21) that relate to the object of study. I believe that to understand the rhetoric of Artificial Intelligence within EU policy documents, these metaphors of AI technologies are important to take into account as well. According to media scholar Marianne van den Boomen,

Discourse metaphors are considered to be key framing devices within a particular discourse. They are condensed statements that tie together narrative clusters of associated conceptual metaphors,

assumptions, and legitimations which constitute together a more or less coherent discursive formation that channels behaviour, principles, and policies. [...] Discourse metaphors frame and organize shared narratives (be it in the form of public opinion, political agendas, research programs, or worldviews), but most of all they organize and install standards, rules, norms and procedures – in short, material-discursive formations of power, truth and knowledge (2014, 78).

Shortly put, these metaphors decide what is relevant and what is not, what is maybe even implemented into policy and what is not. In her manifesto for hacking metaphors in *Transcoding the digital: how metaphors matter in new media* (her dissertation), Van den Boomen states discourse metaphors construct the social-political discourse and regulate the power dynamics within a society (ibid., 188). They generate meaning, are not neutral and can take other forms than just language (for example smells, images, and even acts and movements) (ibid., 187).³

Even though framing is traditionally thought to be done by (mass) media, I believe this way of thinking is limiting. Definitions on framing theory, its meaning and uses within communication and cultural studies is more ambiguous than ever (Cacciatore et al. 2016, 8). Often a binary division between “media frame” or “individual frame” is made. However, according to Cacciatore, Scheufele and Iyengar we need to, with the coming of new media and new digital technologies, rethink our understanding of framing theory (ibid., 17). Accordingly, they think “preference-based effects models”⁴, which refer to personalised persuasion mechanics, are more applicable today (ibid., 18).

I draw from these notions of framing and discourse metaphors to be able to understand the rhetoric on AI. The corpus includes a variety of digitalised and typed documents, many of these are based on debates by the EU parliament (i.e. reports). However, as should be clear by now, rhetoric is not only in spoken form, but can take shape in other forms as well.

To conclude, this discussion provides a framework to analyse the how the EU communicates about Artificial Intelligence throughout the publications. It enables me to study the framing of technologies within the documents, touch upon imaginaries prevalent and examine the metaphors that the EU uses when addressing Artificial Intelligence. Discourse metaphors however are not ‘things’ that can simply be pointed out by examining word frequencies; they instead are constituted through shared

³ In her dissertation, Van den Boomen makes the distinction between digital-material and discourse metaphors. She considers digital-material metaphors, which she also calls “sign-tool-objects”, to be found in technological objects themselves. These digital material metaphors “act as signs and metaphors, but also as things and procedures”. In this sense, she considers the medium specificity of an object to be part of metaphors, stating the implications of such metaphors are “discursive and non-discursive, yet by all means material, embodied, and medium-specifically inscribed” (2014, 188).

⁴ Cacciatore et al. consider this model to be the fifth paradigm for framing theory, developed to take the affordances of new media technologies into account (2016, 20). This entails personalising framing: narrowcasting information, often with commercial intentions, and deals with notions of echo chambers and filter bubbles (ibid., 90). This model thus both addresses the media frame and the individual frame.

narratives and recurring narratives which do not have to use the same exact wording. These are derived by examining rhetoric in relation to historical, cultural and political contexts. Discourse metaphors thus relate to themes found within a corpus for instance.

In the next chapter I discuss my methodology in detail, focusing on debates within the Digital Humanities on distant and close reading. Additionally, I elaborate on the corpus, its origin, method of gathering and limitations, followed by a discussion on the two tools used for analysing and visualising the publications and the analysis' results.

4. A Distant Reading Approach to the Rhetoric on Artificial Intelligence

To be able to answer the research questions, this study used an approach grounded in the Digital Humanities and which is furthermore informed by the field of literary history. This research employed a combination of a distant and close reading. Digital Humanities research entails the use of digital methods and tools for both quantitative as qualitative analysis. This section first discusses the role of distant and close reading within the Digital Humanities. Next, I give insight into the corpus, its selection and limitations are elaborated on afterwards and lastly, I discuss two software tools I use in the analysis: AntConc and Tableau.

4.1 A Dialogue between Distant and Close Reading within the Digital Humanities

The first question that is likely raised is: why a distant reading instead of a qualitative approach such as critical discourse analysis? In the scope of this research, an approach which zooms out rather than zooming in is preferred. The size of the corpus needs an approach of distant reading rather than close reading at first instance. I conducted a computer-aided form of text analysis by employing text mining with AntConc on the corpus, effectively quantifying the corpus. Without reading a single text, one can use distant reading to focus on other elements of the text, such as themes, tropes and genres (Moretti 2000, 57)⁵ rather than examining a text in detail. Alan Liu, professor in Digital Humanities and English, also calls it "close reading 2.0" (2012a, 26), which in itself may be problematic terminology as it suggests there is such a thing as a close reading 1.0 or even 3.0. Results from a distant reading approach can eventually take a visual shape in graphs, maps, trees or other types of visualisations such as timelines and tag clouds (Jänicke et al. 2015, 2). Distant reading "aims to generate an abstract view by shifting from observing textual content to visualizing global features

⁵ Distant reading is a methodology first coined by Moretti (2000) to study a large canon of literary texts, effectively quantifying the text and using computational methods to analyse and find patterns. See Moretti's book "Distant Reading" for more examples of Moretti's take on a research conducting distant reading (2013).

of a single or of multiple text(s)” (ibid.). Relationships between texts can for example be visualised in graphs with nodes and lines representing the connections. Text mining is deployed to derive statistical frequencies and patterns from texts, using digital method tools to do so. Distant reading is also a way to better overcome the issue of personal bias which is often prevalent in a close reading and thus more interpretative approach. Even though the strength of a close reading lies in its inherently qualitative interpretation of a text, using *only* close reading on a large body of text is impossible.

I employed text mining on the entire corpus to look for statistical word frequency, patterns, word clusters and collocates in the texts. Searching for collocates in texts can be used to find words often in close connection with each other and to examine the strength of association. As such, I will be able to uncover which terms are often used in proximity of AI-related terms. Furthermore, text mining can uncover interesting patterns in the corpus of texts when used comparatively (Don et al. 2007, 213). Comparing multiple texts may shed light on (temporal) transformations, changes in terminologies and examine development of AI technologies. Not only will the presence of distinguishable patterns allow for zooming in on certain documents, however the absence of an interesting pattern can also be considered a valuable finding and be worth examining further. That is, to say perhaps a bit bluntly in my own words: “no result is also a result”.

Problematic could be however, the inherent reducing characteristic of a distant reading approach. Text mining is a quantitative form of analysis, whereas within the Humanities qualitative approaches are traditionally used (i.e. critical discourse analysis, textual analysis, cultural analysis, ethnographic research et cetera.). These approaches highly lean on the scholar’s interpretation of the object(s) of study, studying their meaning and its role a broader cultural context. However, within the Digital Humanities, using a combination of quantitative and qualitative approaches with the aid of digital methods and tools, enables the analysis of large cultural corpora and digitalised or digital native texts⁶ (Berry 2011, 4-5). Patterns uncovered with text mining may lead to interesting individual cases, encouraging a closer examination of those cases. However, the Digital Humanities faces many challenges, of which five have been identified by Röhle & Rieder (2012) as the lure of objectivity, the power of visual evidence, issues of black-boxing, institutional perturbations and the quest for universalism. These challenges should be taken into account when conducting computer-aided forms of analysis within the Humanities. Additionally, Lev Manovich argues that by reducing qualitative information to convention-based so-called “graphic primitives” is problematic and therefore argues for incorporating the visual information in visualization themselves, for example by

⁶ My understanding of ‘texts’ is not only to be taken in the literal sense of solely a written text. Within the (Digital) Humanities, ‘texts’ can also be considered images, video, audio, data(bases), infrastructures and other cultural artefacts.

using ImagePlot for analysis and data visualisation (2010, 21-24).

It is no surprise then that the approach of distant reading, which is inevitably reducing in one way or the other, undergoes some criticism. Authors such as English Literature scholar Maurizio Ascari and Journalist Kathryn Schulz are critical of the approach. Schulz argues Moretti longs for a certain scientific status, whereas he is not studying a science. Schulz here compares Moretti's approach to a theology: "The counterpoint to theology is science, and reading Moretti, it's impossible not to notice him jockeying for scientific status". She states, "Moretti often mistakes metaphor for fact" (2011, n.p.) and literature could not be thought of a system that conveys truth and that can be considered completely objective. Ascari takes a similar stance in this debate, stating that abstracting literature in models does not do justice to its complexity (2014, 16). He is concerned with Moretti's "tendency to regard distant reading as objective, within the framework of a purportedly scientific approach to the humanities" (2014, 2), in which biases are disguised as objective facts. Scholars within the Humanities should however be aware of their biases and address them in their research papers.

Furthermore, Liu states the current challenge for the Digital Humanities "will be to discover technically and theoretically how to negotiate between distant and close reading" (2012a, 27), and some scholars are rightfully arguing for a combined approach (Ascari 2014, 16; Wilkens 2012, 255). As Digital Humanities and English Literature scholar Matthew Wilkens argues:

We may very well still need to read some of the texts closely, but text-mining methods allow us to direct our scarce attention to those materials in which we already have reason to believe we will find relevant information. Though we're not used to framing our work in terms of rapid hypothesis testing and feature extraction, the process isn't radically different from what we already do on a much smaller scale. Speed and scalability are major benefits of this strand of computational work (2012, 255)

This passage from the edited book *Debates in the Digital Humanities* published in 2012 discusses a plea for a combined approach. In this book Liu's article on the cultural criticism within the Digital Humanities addresses the ongoing debate within literary studies about "distant reading versus close reading". However, according to Liu new digital technologies change the way we need to examine this debate as they give "different methodological context" (2012b, 503). That is, new methodologies are developed to deal with these emerging digital technologies and their new text forms they bring with them such as archives and networks (ibid., 494). "Sophisticated digital humanities methods that require explicit programmatic instructions and metadata schema now take the ground of elemental practice previously occupied by equally sophisticated but tacit close reading methods" (ibid., 493). Distant reading in this sense does however not take over the practice or entirely negate a close reading. Liu mentions the increasingly smaller role of literary passages within Digital Humanities

research. They are replaced by visualisations of patterns and word frequencies. However, Liu argues in the context of Moretti's distant reading approach:

One now close reads graphs and diagrams that have roughly the same cognitive weight (and even visual size on the page) as block quotations of old, even if the mode of "meaningfulness" to be read off such visualizations is of a different order (linking the act of analysis more to breadth of field than to a sense of depth or emplacement) (ibid., 494).

In this sense, Liu is recognising a shift within the traditional Humanities disciplines in which scholars became aware of the increasing importance of digital technologies within their research practice, but also related to their object of study (ibid.).⁷ Liu is clear in his stance: he worries Digital Humanities will be seen as a "purely instrumental" means within the Humanities (he calls it "servants")⁸ and argues that the Digital Humanists should not rely purely on this practical role, but "move seamlessly between text analysis and cultural analysis" (ibid., 495), as the texts studied within the Digital Humanities are considered cultural artefacts. These cultural artefacts need to be studied within their broader context from a critical perspective. Digital Humanists should therefore, according to Liu, both concentrate on continuing their traditional research methodologies, but alongside should go into a dialogue with older fields of new media studies, reflecting on their methodologies and tools (ibid., 501). The rapid changing digital technologies and impact on what can be considered 'text' call for such a reflexive approach.⁹

A "Distant Reading versus Close Reading" would be out of place as the title of this subchapter, as it is not the question of a binary division between the two approaches (Bode 2017, 79), but the question of convergence. As AntConc allows for examining words in their textual context by using the concordance and cluster tool, it means my method is not solely quantitative. Rather, I argue it is a combination of both distant reading and close reading. Even though I quantify texts, I still

⁷ To clarify this further, Liu gives the example of humanists who understand the need to use "a search function to do research", stressing the fact that for online searching we rely on the digital tools and digital humanities research to practice our scholarship (2012b, 494).

⁸ Likewise, David Berry has for example mentioned this in "The Computational Turn" (2011), also warning for Digital Humanities' practical role being treated as "servant" to the Humanities. In this article, he discusses the three waves of the Digital Humanities. The first wave is purely quantitative, in the second wave digital tools are used to *interpret* digital born material and in the third wave (in which we are situated now) scholar start *reflecting* on the medium specificity of their study objects, tools and methods.

⁹ For example, Michael Marcinkowski advocates the need for a "ethnomethodologically-oriented user study" to be able to study ambient literature. This approach is "simultaneously close and distant, one that is founded on both the experiences of readers at large and on the interpretations of an expert reader" (2018, 10). Related to this, Katherine Hayles (2013, 231) also argues for a reader-response theory that combines both close and distant reading.

need to examine, that is, close *read*, them in the context of the sentence to make sense of the words and the context.¹⁰ My approach thus is still highly interpretable and therefore can be considered to have both quantitative and qualitative elements to it. According to Jonathan Culler, crucial to close reading is:

[respecting] the stubbornness of texts which resist easy comprehension or description in terms of expected themes and motifs. The close reader needs to be willing to take seriously the difficulties of singular, unexpected turns of phrase, juxtapositions, and opacity. Close reading teaches an interest in the strangeness or distinctiveness of individual works and parts of works (2010, 22).

Distant reading may help into determining these outliers in a large corpus, often having an explorative function to study the “blank space on our map of the past” (Underwood 2017, 7). But ultimately to fully respect these outliers, a close reading is necessary. I thus utilise the strengths of distant and close reading to my advantage. As the first stage of this research is explorative, distant reading is employed at first. After which close reading aids into the interpretation of passages in the text. Next, I discuss the corpus that I study in this research, its selection, the specific content and limitations.

4.2 Corpus selection and limitations

This section is dedicated to the corpus that is studied in this research. To make future claims about any dataset used in a research, it is important to know the origins of a dataset (boyd & Crawford 2012, 668). Therefore, I discuss the origin and gathering method of my dataset, followed by the contents and a reflection on any weaknesses and limitations.

4.2.1 Corpus: European government publications on Artificial Intelligence

The European Commission (EC) is considered the executive arm which takes decisions on the EU’s political and strategic direction and submits legislative proposals. Publications from both these institutions are therefore important to consider when examining policy documents. Additionally, the dataset will contain European law documents, as these are the official policies. These can be found on the EUR-Lex website. The EUR-Lex contains various types of documents which are freely accessible on the website, including:

the Official Journal of the European Union; EU Law (EU treaties, directives, regulations, decisions, consolidated legislation etc.); preparatory documents (legislative proposals, reports, green and white papers etc.); EU case law (judgments, orders, etc.); international agreements; EFTA documents;

summaries of EU legislation, which put legal acts into a policy context, explained in plain language;
other public documents (“About EUR-Lex” N.d.).

As the EUR-Lex not only contains law documents, but also reparatory documents, it allows for following the procedures leading up to legislation and regulation. Using the EUR-Lex, I searched for “Artificial Intelligence” within their database. This search query resulted in a total of 320 documents published by the EU within a timeframe ranging from June 1977 (the first publication published) to June 2018. Some publications are categorised into multiple years in the EUR-Lex. Especially in older publications, single pages are published instead of the document as a whole. Many furthermore include an Annex, which is a supplement often containing summaries, additional information or law articles, therefore the initial amount of documents gathered was 720. After removing the duplicates, the final dataset gathered from the EUR-Lex contains 361 unique publications (see Appendix B3 for a full list of the corpus and each publication’s title, type and year).

Besides downloading the documents, a CSV file with metadata can additionally be retrieved from the website. Most of the documents have a unique CELEX-number. I however encountered some documents which have no CELEX number and assigned them a number starting with “MIN” + (number). The meta-data file consists of: CELEX number, Title, Form, EUROVOC descriptor_1, Subject matter, Directory code_2, Legal basis_3, Date of document, Date of publication, Author, Document sector, Document type, In force indicator, OJ series, Class of the OJ, Number, Publication Reference.

Only six documents have ‘artificial intelligence’ in their title, suggesting only these texts are mainly about artificial intelligence (see Appendix C5). Three of these are from 1985, one from 2017 and two from 2018. The word count shows that the word ‘artificial intelligence’ is most prevalent in documents originating from 2018. Keep in mind, however, that all documents in the corpus were retrieved based on the search query in the EUR-Lex. Additionally, the EUROVOC indicator is used by the EUR-Lex to describe the contents of a document. ‘artificial intelligence’ is an EUROVOC indicator in 12 publications (see Appendix C6).

4.2.2 Corpus limitations

The distribution of the amount of publications in every year is however not equally divided, which is an important fact to consider in the analysis. For example, the year 2018 contains 150 documents, whereas 2017 contains significantly less entries, namely 67 (see Appendix B1 for full list). Some years are furthermore missing from the dataset, as no data from those years is available on EUR-Lex. This does however not necessarily mean there is no data produced in this period. I am therefore completely dependent on what is uploaded by the EU in the EUR-Lex. Additionally, some documents are Multilanguage to some extent. I filtered out documents written largely in a different language than English, but included ones that contain small sections of other languages.

As AntConc can only read text files and the majority of the documents were PDFs, I used a script in RStudio (version 1.1.414) to convert all PDFs to text files (see Appendix A1). It is therefore possible that some text was lost in the conversion process. By using this script, not only relevant text was converted. Headers, page numbers and other unimportant information is included as well. I tackled this issue by filtering as much as possible in the analysis with AntConc and in Tableau, two software tools I discuss next.

4.3 Text mining in AntConc

AntConc (Anthony 2018, version 3.5.7) is a tool to conduct textual analysis on a large number of texts. AntConc contains a set of tools including a concordancer, word and keyword frequency generators, tools for cluster and lexical bundle analysis, and a word distribution plot (Anthony 2004, 7). The algorithms used in Antcon to determine collocates use either the MI-score or the T-score, which can be configured in the 'Tool Preferences' section of AntConc. To measure the collocates, I used the default option MI-score which is "a measure of the probability that the collocate and key word occur near each other, relative to how many times they each occur in total" (New Castle University 2017, 7). This MI-score is represented as 'Stat' in Antcon and searches for non-sequential patterns. Anthony simply describes it as a "value [that] measures how 'related' the search term and the collocate are" (2017, n.p.). The MI-score uses equations described in Stubbs' "Collocations and Semantic Profiles, Functions of Language" (1995).

I employ AntConc mainly for finding interesting patterns and outliers in the texts, examining words in their textual context. The concordance tool is used to see how words are commonly used in the corpus, as it allows for examining a word in its textual context (see Figure 1 on next page). This is especially valuable as I can filter out any standardised terminology or duplicates by examining a large part of the sentence in which the search word is included. Furthermore, the collocate tool can be used to find words often in close connection with each other and the Stat statistic will then represent the strength of the association. The collocate tool can thus be used to investigate patterns in datasets, as it shows which words are statistically likely to appear in co-occurrence. Furthermore, it is also possible to compare keywords from multiple texts with the keyword list. The keyword tool can be used to look for frequent and infrequent words among texts, comparing two or more texts. Lastly, the cluster tool shows all clusters bases on a search word and the N-Grams tools allows for finding commonly used expression in a corpus as it scans the entire corpus for one or multiple word length clusters (Anthony 2017).

The search query and its result can easily be exported into a .txt file. This file can be imported in Excel to further investigate the data in either Excel or clean the dataset to import it in Tableau. This is especially useful for larger corpora, as the data can be sorted in Excel. AntConc is in that sense

somewhat limited and less user friendly. Furthermore, as results can be saved, they could be included into the appendix, which contributes to the reproducibility and validity of the research or should be available upon request. However, should the dataset contain personal information, the data should be handled ethically. This could entail anonymising the results or in cases of extremely sensitive information, rejecting a request of access.

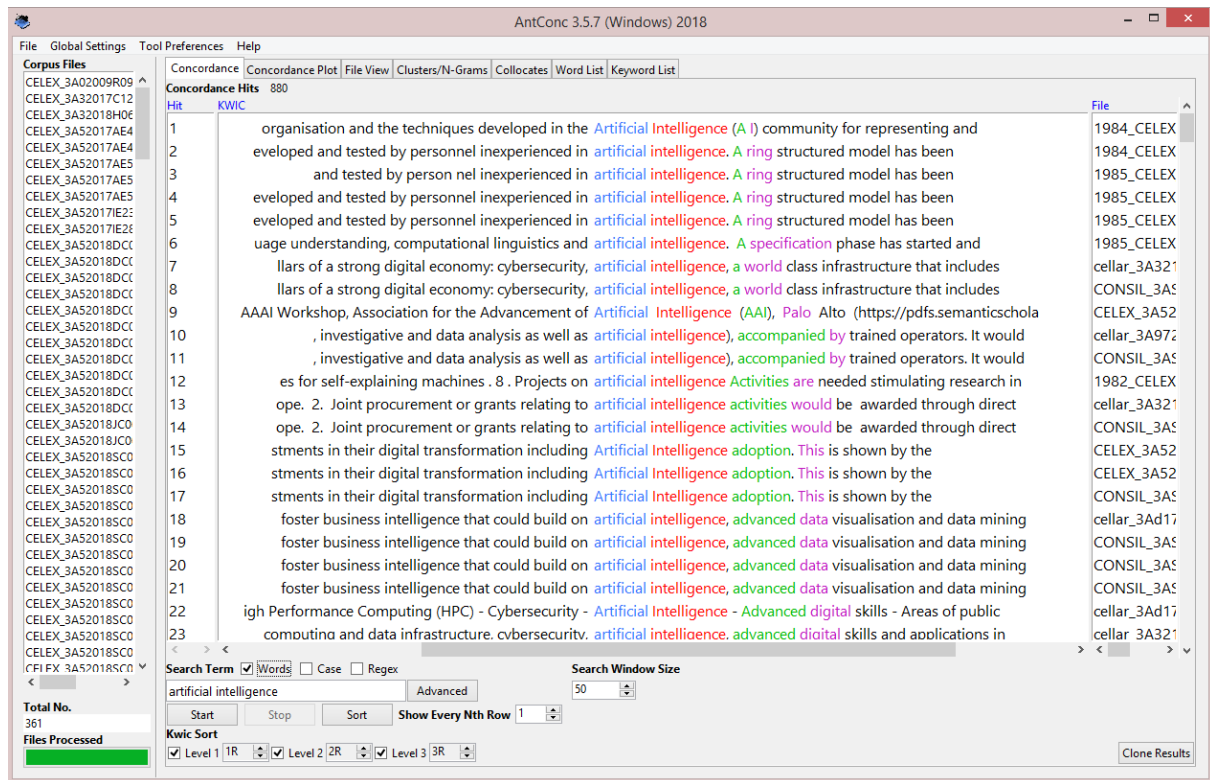


Figure 1. Graphical User Interface of AntConc. Screenshot shows the concordance tool, where I searched for “Artificial Intelligence”. The imported corpus files are shown in the left box, whereas the results are in the middle of the screen. The ‘File’ box at the right of the interface shows in which files the results presented in the middle can be found.

4.4 Analysing and visualising in Tableau

Tableau (version 10.5) is a data analysis and visualisation tool which has many features and functions that allow for quickly uncovering hidden insights in datasets. It allows for simultaneously visualising and analysing large datasets. Using Tableau, visual patterns are quickly spotted and isolated to further investigate.

In the scope of this research, I used Tableau to analyse and visualise my data from the AntConc analyses to look for interesting patterns and outliers within the EU publications. Furthermore, it is possible to completely manipulate graphs and therefore important to note the graphs are always an interpretation of the dataset made by the researcher. Data visualisations contribute towards decision making and determine how we gather and shape our knowledge about

the world we live in (Kennedy et al. 2016; Drucker 2011). Therefore, it is also important to not only critically inquire the visualisation itself, but in this case also the tool used to make this visualisation as many conventions are built into visualisation tools. The choices of graphs types are limited and represent commonly used types. “A convention is a symbolic or social practice that is shared, readily understood and widely accepted by members of a cultural group” (Kennedy et al. 2016, 717). As such, conventions are often used to make a visualisation more comprehensible for the viewer. Consequently, they can also create a false sense of objectivity according to Kennedy et al. (2016), Hill et al. (2016) and Drucker (2011). I would like to put emphasis on the notion that visualisations presented throughout this paper are my interpretations of datasets and are can definitely not be considered a direct or objective representation of the data and the information conveyed through it.

On a last note, when gathering, analysing and visualising my dataset, I will take Röhle and Rieder’s (2012) five challenges to Digital Humanities into account, as well as the six provocations as mentioned by Crawford and boyd (2012) to make sure the data is handled with care, to validate any claims I will make about the datasets and to be transparent as possible about my methodology as such that I can account for my research. In the following section, I discuss the findings of my analysis.

5. The European Government Rhetoric on Artificial Intelligence

In this section, I discuss my main findings of the analysis. It is divided in two parts. First, I discuss my investigation of words frequencies within the corpus. Next, I take a closer look by examining the rhetoric Artificial Intelligence in detail and its context by using the collocates tool and concordancer in AntConc.

5.1 The Language of the European Union

To start off with, I examined the word frequency of all documents both together and separated per year. As mentioned in the corpus limitations, the distribution of words in not equally divided. This graph suggests an immense increase in words after 2013, however parallel to this is an increase in the number of publications (see Appendix B1).

When compared to word frequency divided by year it becomes more interesting. Using AntConc’s wordlist feature, I made a separate word frequency list. This shows the frequency of words used per year. As there is, naturally, a high occurrence of verbs, adverbs, prepositions and linking words, I first filtered on the word amount, selecting only results with a word frequency higher than 10.000. Next, I filtered out common words which ultimately resulted in a list of mostly nouns which could be interesting to investigate (see Appendix D1.1-D1.3 for full filtered list). These are

divided by year, which enables analysis of every year individually. For most of the words in this list, their use over time is similar to the shape of Figure 2. At first instance, some of the most notable outlier words are ‘digital’, ‘community’, ‘communities’, ‘era’, ‘innovation’, ‘funding’, ‘official’, ‘regulation’, ‘research’, ‘security’, ‘systems’ and ‘work’. These differ from the general overall shape of Figure 2.

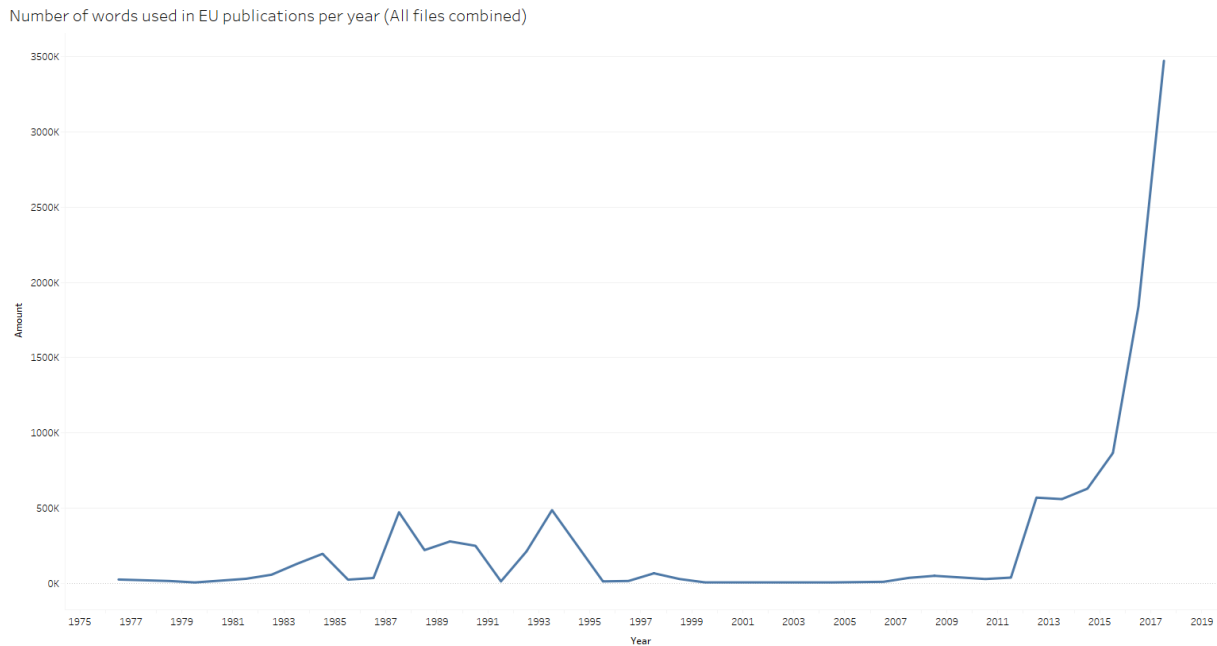


Figure 2. Number of words used in EU publications per year (All files combined). See Appendix C1 for a detailed version. Made in Tableau.

For example, the word ‘digital’ is rarely used before 2013, whereas a word such as ‘communities’ is used most often in the period around 1980 to 1990. Quite interestingly, this word has a peak in 1988, where it is mentioned almost 5000 times. The use of the word ‘community’ is however more equally divided. When investigating these words into more detail in the AntConc program, much of these outliers can be explained. They are for example certain terms often used in EU publications and is part of the EU terminology, such as ‘era’, which stands for European Research Area. A similar situation applies to the word ‘communities’ and ‘official’.

I believe the words ‘development’ and ‘innovation’ are closely linked by nature, however, as Figure 3 shows, they are used differently in different time frames. In the 1980s and 1990s the word ‘development’ was preferred. ‘Innovation’ came up in 2013 and from here we can see both words are used in the EU publications. Closely linked to ‘innovation’ is the word ‘research’, as research is of course needed to innovate (see Figure 4). Words such as ‘development’, ‘innovation’ and ‘contribution’ are frequently found in close proximity of the word ‘research’, a sentence including the cluster ‘research contributes to innovation’ is often prevalent.

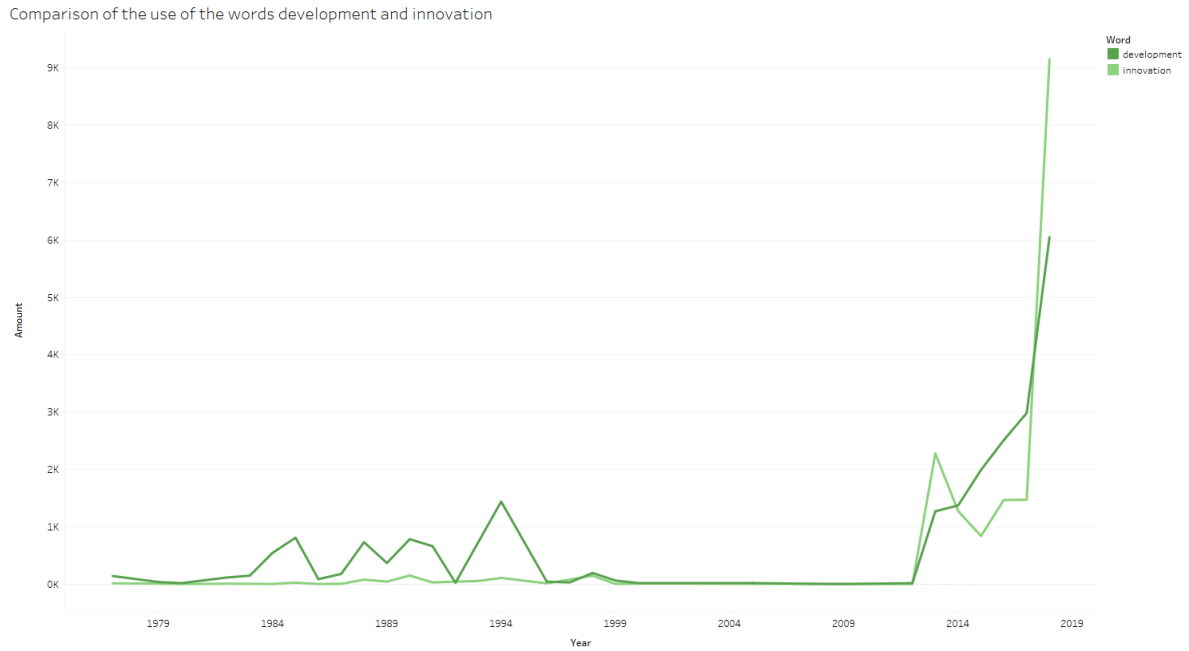


Figure 3. Comparison between the use of the words development and innovation from 1977 to 2018 in EU publications. Made in Tableau.

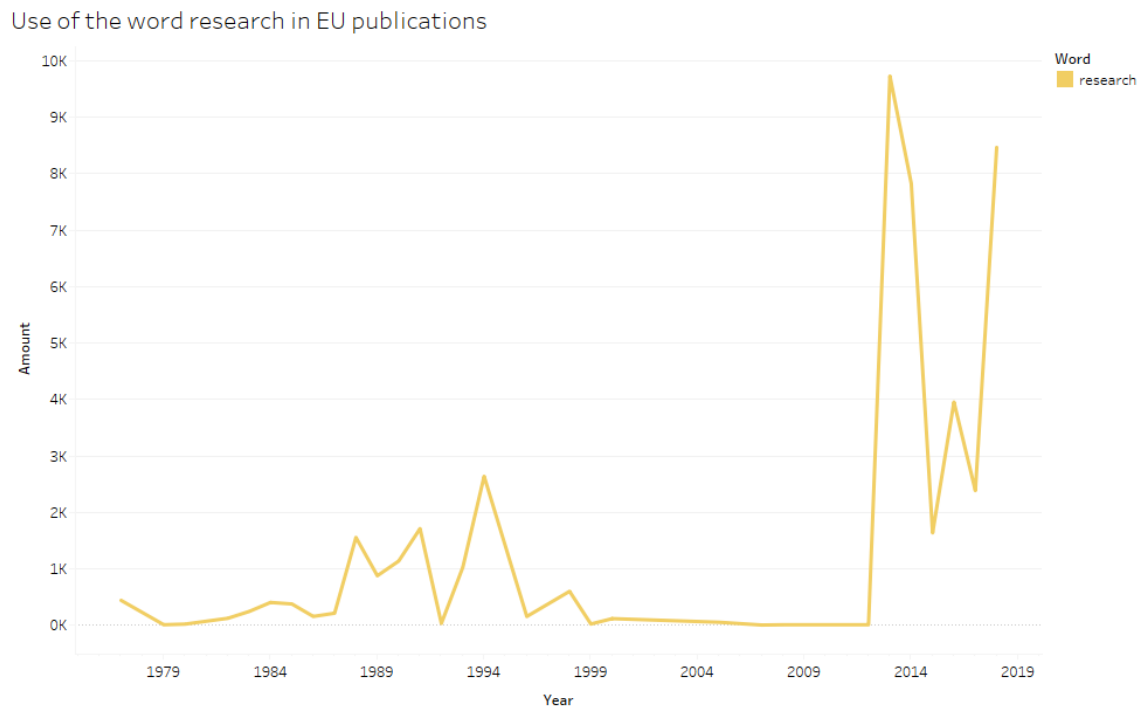


Figure 4. Use of the word research from 1977 to 2018 in EU publications. Made in Tableau.

Additionally, the presence of the word ‘funding’ lies mostly in this second peak period from 2013 to the present. It could suggest that the European Union does more funding in this period. ‘Regulation’ is quite interesting as well, as it has a peak in 1988, goes down and slowly raises again from 2000 on, peaking in 2013 and from there constantly rising.

A final interesting outlier I discuss is the word ‘security’, which is almost not included before 2013 (see Figure 5). In 2017 there is a rise in the use of ‘security’ in the corpus. This suggests that concerning EU documents about AI, security was not an issue often thought of before 2013. A closer examination of the word ‘security’ in AntConc with the concordance and cluster tool shows that the word cluster ‘security of data’ is mostly present in 2017 and 2018. There is only one publication from 1984 which contains this cluster. Zooming in on ‘security of’ shows many different clusters, often focused on the security of IT-related elements (such as IT devices, data, networks, (super)computers, systems, websites, the internet, IT infrastructures, the Cloud, operation systems, data processing, access and data transfer etc.). This suggests the EU has paid more attention to IT security in their publications. However, as early as between 1980 and 2000 security of access to data, software and data transfer is mentioned already, among other topics such as the security of buildings (i.e. surveillance).

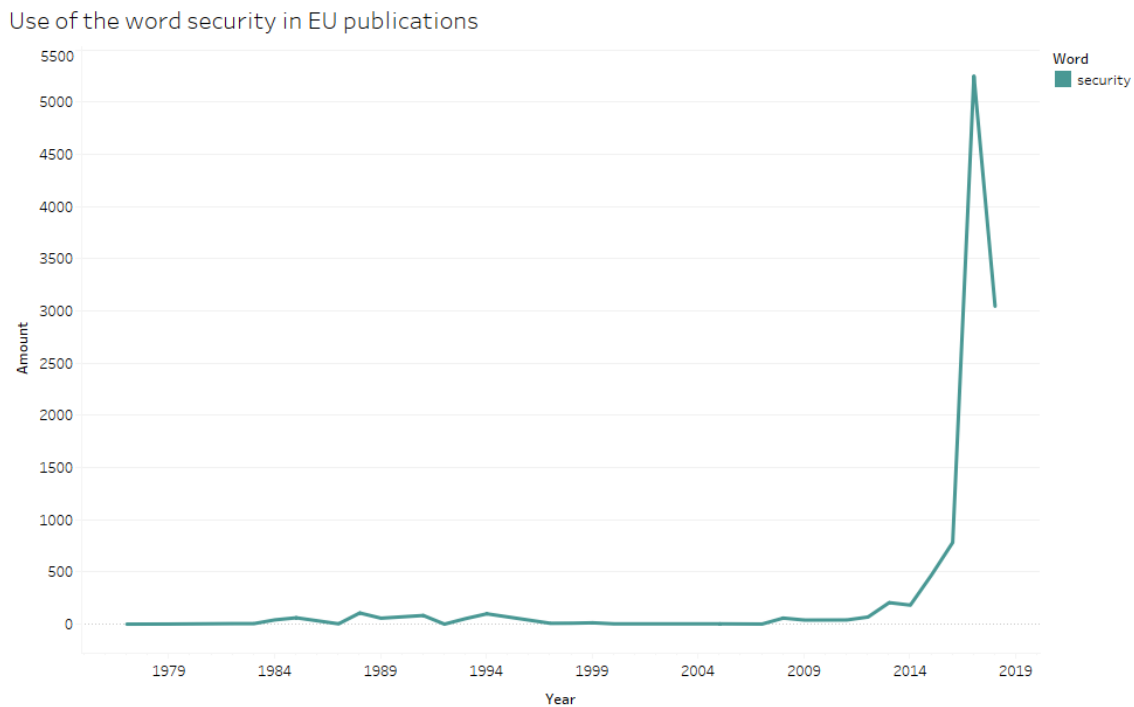


Figure 5. Use of the word security from 1977 to 2018 in EU publications. Made in Tableau.

Number of European publications on Artificial Intelligence over time

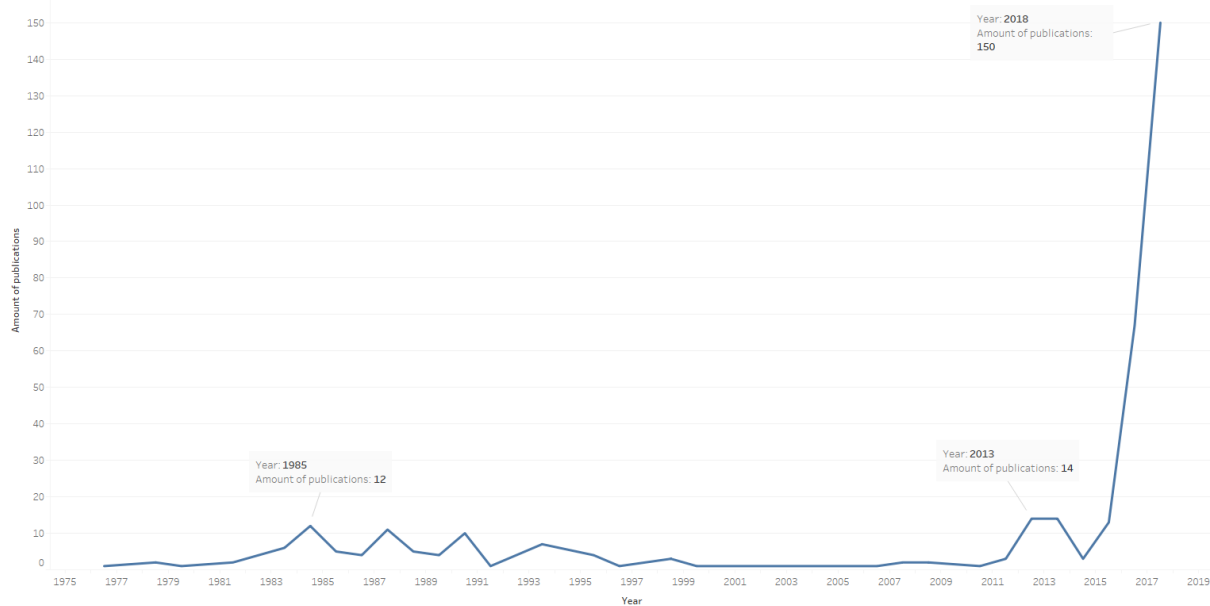


Figure 6. Number of European publications on Artificial Intelligence from 1977 to 2018. The three annotations show the amount of publications at that period in time. Here it becomes prevalent the distribution of publications is not equal. See Appendix B4 for a detailed version. Made in Tableau.

Distribution of publications over time in itself also gives interesting insights (See Figure 6). There is a period between 1995 and 2011 where few publications have been categorised, the average lying around 1 per year during this timeframe. Interestingly, around 1983 a small increase can be spotted, after which small peaks appear in the 9 years after 1983. Between 2000 and 2011 there is an unexplainable absence of publications, which is a curious divergence within the corpus. The next unmissable peak starts around 2013, with a record of publications concerning artificial intelligence in 2018 (from January to June, so only six months' worth of publications). Figure 6 shows AI can be considered an often-discussed topic in EU publications in more recent years. The publications ranging from 2013 to 2018, a total of 261 documents, make up 72.3 percent of the total publications. It is no coincidence artificial intelligence is mentioned more often after 2013 and rising even more rapidly after 2015 as it is one of the fastest emerging technologies. According to Elish and boyd "countless public and private sector actors feel the need to implement AI systems", a phenomenon they define as a "hype-driven ecosystem" (2017, 18) and which are shaping "social, economic and political spheres" (ibid., 1).

Concerning the of types of publications, communication, staff working documents, impact assessment and proposals are the most frequently occurring types (see Appendix B2.1 and B2.2). Communications usually set out a course of plan for the EU, often including proposals for regulations. Impact assessments are studies carried out on topics that may have impact on social, environmental and economic level to determine if there is a need for action ("Impact assessments" N.d.). Notably,

there are few decision documents. The presence of many proposals for regulations or acts suggest the policymaking is still in process. Budget documents entail the entire budget of the EU for a specific year.

5.2 The European Union and Artificial Intelligence

Into studying the rhetoric of AI, it could prove more useful to study words in their specific textual context rather than counting the frequency of relevant words. AntConc allows for such examination by using the in-built concordance, concordance plot and cluster tool. Furthermore, the probability of co-occurrences is measured using the collocates tool. The close reading approach was thus conducted. I will highlight and discuss the most interesting findings in the following section.

Examining the collocates of Artificial Intelligence is the next step into understanding the sociotechnological imaginaries of AI. The MI-score used to calculate the collocates, is “a measure of the probability that the collocate and key word occur near each other, relative to how many times they each occur in total” (New Castle University 2017, n.p.). It measures the strength of the association between words. The Stat statistic represents this strength. However, not only the frequency is important, but also the frequency to the left or right of the search word. Figures 7a and 7b show the collocates of “Artificial Intelligence”, sorted by frequency. This list is filtered, showing only the collocates with a frequency of 10 or higher. I furthermore filtered out words such as ‘the’, ‘a’, ‘it’ to only show meaningful results. The first result, ‘intelligence’ has a frequency of 15 at the left of the word and frequency of 893 to the right of the word. This thus suggest intelligence is often found in close proximity to the right of the word Artificial Intelligence.¹¹

If the complete list of collocates would be sorted by Stat, many of the higher Stats have a low frequency. This is considered a limitation of AntConc, as Anthony mentions himself in an AntConc tutorial video (2014). Therefore, I only included collocates with a frequency of 10 or more in this list. To put the results discussed in this chapter more into perspective: the highest Stat present in the complete list is 13.42545 and the lowest -0.76252. This following next section only addresses the findings from the collocates, unless otherwise said.

Figures 7a and 7b show interesting pointers which show similarities between the use of various words as discussed in chapter 5.1. When clicking the collocates in AntConc, they can be further

¹¹ To prevent any confusion: collocates are not necessarily placed directly after or before the search word. For example, table 7a now suggests ‘intelligence’ is found often to the right of the word ‘artificial intelligence’. This is often due to AI being mentioned twice in a sentence for example. There could be two or three words in between. Furthermore, AntConc cannot ‘read’ blank spaces, as such titles come right before the first sentence of a paragraph. This means for example that a title could be: “What is Artificial Intelligence?” and the next sentence could start with “Artificial Intelligence is..” or “In computer science, Artificial Intelligence..” As the Stat of the collocate intelligence is high, this suggest sentence structures like this are frequent.

examined in their textual context in the concordance tool. It can be seen here that a word such as 'cybersecurity' is often placed both before and after AI, with a relative high Stat of 9.17863. Quite interestingly, the concordance tool shows the word 'cybersecurity' has only been mentioned in publications dating from 2017 and 2018. Furthermore, other associated words to this collocate are media literacy and digital skills, suggesting the incentive of the EU to educate their citizens on these topics, as well as apparently seeing cybersecurity and AI as challenges. 'Performance' has a high frequency as it refers to High Performance Computing in the publications. Closer examination in the concordance tool shows the EU sees it as an emerging technology, trying to reinforce their capacities in High Performance Computing and Artificial Intelligence. Words such as 'research' and 'funding' can be found in the cluster as well, suggesting their desire to invest in these technologies. The EU refers to Artificial Intelligence often as an innovative, new or cutting-edge technology in their 2017 and 2018 publications, as can be derived from the following passages in the publications:

Collocate: technologies

through **advanced technologies**, including artificial intelligence
relevant technologies including cybersecurity or artificial intelligence
stimulate broad adoption of artificial intelligence and other advanced digital technologies
areas that could bring **important innovations** are artificial intelligence and robotics
socially relevant technologies such as cybersecurity and artificial intelligence
new technologies such as artificial intelligence, robotics
exploit vast opportunities provided by technologies like artificial intelligence and big data
key innovative technologies like artificial intelligence, big data and robotics

Collocate: new

new technological developments such as artificial intelligence
artificial intelligence and supercomputing **offer new opportunities**
new technologies such as artificial intelligence

Collocates for Artificial Intelligence (Filtered), sorted by frequency (908 to 17)

Frequency	Freq (L)	Freq (R)	Stat	
908	15	893	12.97471	intelligence
152	85	67	6.02171	data
140	108	32	9.57602	computing
133	52	81	9.17867	cybersecurity
115	81	34	7.42212	technologies
101	85	16	7.91562	performance
98	81	17	6.86883	high
97	23	74	11.71248	robotics
95	27	68	6.54603	digital
91	84	7	6.10839	such
81	32	49	8.04720	advanced
62	33	29	9.67921	big
61	7	54	9.22562	ai
47	22	25	8.25382	internet
43	1	42	5.13511	europe
37	21	16	7.57286	techniques
33	10	23	6.62201	applications
31	23	8	4.13633	new
			5.44191	areas
28	22	6	9.08306	things
27	19	8	7.06400	cloud
26	5	21	6.05510	skills
	6	20	6.03777	analysis
	11	15	7.93978	capacities
	23	3	4.58807	use
25	7	18	6.88878	next
	10	15	4.51424	systems
	17	8	9.72058	analytics
	21	4	5.03313	energy
24	12	12	6.10503	learning
22	8	14	7.62396	generation
	15	7	1.57480	european
21	11	10	7.89444	artificial
20	3	17	10.56747	blockchain
	12	8	2.24710	research
	17	3	5.05128	communication
	18	2	3.67793	innovation
	20	0	7.30236	hpc
19	9	10	5.28779	application
	16	3	8.24502	clean
18	9	9	7.51990	machine
	10	8	9.34745	robots
	18	0	5.89537	building
17	6	11	4.37640	technology

Figure 7a. List of the collocates of Artificial Intelligence, sorted by frequency. Made in Tableau.

Collocates for Artificial Intelligence (Filtered), sorted by frequency (16 to 10)

Frequency	Freq (L)	Freq (R)	Stat	
16	4	12	4.25976	well
	7	9	5.69796	software
	12	4	7.08005	build
15	1	14	12.16242	augmented
	6	9	4.35274	xad
	9	6	3.79330	up
	10	5	1.77219	eu
14	1	13	5.38145	design
	3	11	5.11160	com
	10	4	4.70875	key
			6.36167	media
			8.05539	digitisation
	11	3	3.68014	specific
	12	2	3.22027	services
	14	0	5.54674	change
			6.48966	developments
13	1	12	9.23107	quantum
	2	11	8.19220	virtual
	10	3	2.60503	development
			5.00436	objective
	12	1	5.32176	example
		5.66954	communications	
12	1	11	8.35936	algorithms
	2	10	5.01606	human
	4	8	4.64218	science
			4.92993	networks
	5	7	9.10955	cognitive
	9	3	3.29542	particular
			5.17200	processing
	10	2	3.51393	work
		7.93627	digitalisation	
11	0	11	6.23204	recognition
			9.64648	pattern
	4	7	5.31788	solutions
	7	4	7.15187	distributed
	8	3	5.29056	world
	9	2	3.95415	industry
			6.42340	enabling
	10	1	5.06191	develop
			7.56521	tech
			8.90189	deep
	11	0	3.59414	area
		4.60876	challenges	
		6.04096	notably	
10	2	8	4.95378	etc
	8	2	3.78340	related
			4.80120	economy
			6.15306	strengthen
	9	1	4.16007	field
	10	0	5.45794	climate
		6.23760	manufacturing	

Figure 7b. List of the collocates of Artificial Intelligence, sorted by frequency. Made in Tableau.

This presence of the ‘newness’ of AI is interesting, as AI is a technology which can be traced all the way back to the 1950s. It is suggested here, AI is a completely new technology with undiscovered opportunities. With respect to the technological imaginary, new technologies are considered an ultimate solution to the social and technological problems in a society (de Vries 2012, 166).

Therefore, by presenting AI as a new technology as opposed to an older technology, it keeps its “magical” characteristics.

However, risks of these ‘technologies’ are addressed as well. It is mentioned that certain skills are necessary to deploy the technologies to reduce any risks. However, Figures 7a and 7b include basically no negatively connotated collocates. The only word coming close to such a connotation is ‘challenges’, which often refers to the skill challenges of emerging technologies. The following passages were examined:

Collocate: challenges

continue to monitor the opportunities and challenges brought by artificial intelligence solutions
the **new technological challenges** in the sector (from artificial intelligence)

the **challenges** of artificial intelligence and pattern recognition

proposed research topics within these challenges: artificial intelligence and autonomy

No notion of highly dangerous risks can be found in the corpus, only mentions of challenges. As Jasanoff and Kim argue, imaginaries may also warn against risks of innovations which are pushed too hard of fast (2009, 123). This does not seem applicable to the EU publications. For example, the petition against autonomous weapons (or killer robots) is mentioned in solely one text whereas influential scholars and large companies have signed this petition. There are a few mentions of possible risks or issues, but these are overshadowed by the mentions of possibilities for AI innovations. Even though Brooks has warned against dystopian views on AI (2017), its possible ethical implications should be considered more often. The absence of negatively connotated collocates in proximity of AI shows not enough direct attention is paid to these implications and risks within the publications. In this sense, the AI is attracting attention mostly to innovation and possibilities, “filtering out” as Gamson would say the explicit mentions of risks (in Hänggeli and Kriesi 2010, 142). As such, the positive framing of AI could be a strategical move by the EU to motivate their investments in AI.

Another interesting finding is the high Stat (10.56747) of the word ‘blockchain’, which suggests it has high probability of being mentioned close to AI. Blockchain has been a point of attention of the European Parliament, as they work to stimulate its development (“Blockchain technology” 2018). It is considered as an emerging technology. AI as a solution to problems is suggested in these passages:

Collocate: blockchain

the potential of **digital solutions** such as blockchain and artificial intelligence

Collocate: solution

without **state-of-the-art solution** and equipment (including artificial intelligence)

based on artificial intelligence **solutions**

use of artificial intelligence in different **technological solutions**

Collocate: key

key digital technologies – Advanced material – Artificial Intelligence

key enabling technologies such as artificial intelligence

key innovative technologies like artificial intelligence, big data

artificial intelligence and other **key enabling technologies**

Something that furthermore caught my attention is use of the word ‘deep tech’ when referring to technologies such as AI, biotech, augmented reality, quantum computing and machine learning. Deep tech is a term coined by Swati Chaturvedi in 2014. She refers to deep tech as “companies founded on a scientific discovery or meaningful engineering innovation” and which also seek to make the world a better place (“Deep Tech” n.d.). It once again suggests using these technologies for a good purpose, finding solutions to societal problems. The general rhetoric on AI in these publications are quite positively inclined and focused on future innovations. The publications suggest AI is one of technologies that will help improve society. However, by examining ‘research’, I found that it is surprisingly less prominent in the corpus than I would have initially thought. Even though AI technologies are considered innovative and upcoming, the analysis of the corpus suggest research on AI technologies by the EU is still in its early stages. The use of ‘innovation’ seems to be similar to that of ‘research’. Notably is on the other hand, that these texts are recent, from either 2017 or 2018, showing a rapid increase of research on and innovation of AI by the EU. This coincides with the funding of the EU. For example, in 2013 the EU has pledged to allocate up to 700 million euros for Robotics projects for the period 2014-2020 (Ansip 2017). On 25 April 2018, the European Commission stated in a press release that they will increase their investment to 1.5 billion euros for the period 2018-2020 (“EU Press release” 2018). In one of the communication documents from 2018, AI is defined by the European Commission as:

In Artificial intelligence (AI) refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals. AI-based systems can be purely software-based, acting in the virtual world (e.g. voice assistants, image analysis software, search engines, speech and face recognition systems) or AI can be embedded in hardware devices (e.g. advanced robots, autonomous cars, drones or Internet of Things applications). We are

using AI on a daily basis, e.g. to translate languages, generate subtitles in videos or to block email spam (European Commission 2018b).

Interestingly, the European Commission has furthermore made a statement related to this perception on AI which should not be misunderstood as science fiction:

Artificial intelligence (AI) is not science fiction; it is already part of our everyday lives, from using a virtual personal assistant to organise our day, to having our phones suggest songs we might like. Beyond making our lives easier, smart systems help us solve some of the world's biggest challenges: treating chronic diseases, fighting climate change, and anticipating cybersecurity threats. AI is one of the most strategic technologies of the 21st century ("EU Press release" 2018).

These findings coincide with the notion of imaginaries, as imaginaries are to be considered to project desires for a better society onto technologies (Lister et al. 2009, 67). Putting AI into a box called deep tech strengthens these associations of it being an improvement to society and a solution to problems. "They create visions of the good" (Jasanoff and Kim 2009, 123) and of the possibilities, which in this case of the quote above is "treating chronic diseases, fighting climate change and anticipating cybersecurity threats". Whether it coincidentally fosters to a feeling of completeness or wholeness can only be determined with a more empirical approach. Sociotechnological imaginaries also determine the way of technological innovations (Flichy 2004, 10-11) and the allocation of funds by the government into realising the material infrastructures (Jasanoff and Kim 2009, 123).

Artificial Intelligence is furthermore often mentioned in proximity of 'Big Data', which is no surprise as these technologies are closely linked (Elish and boyd 2017, 2). Additionally, other technologies related to AI often mentioned in close proximity are The Internet of Things, Cloud Computing and Robotics. Four publications from 2017 mention specifically that Machine Learning is an application of AI, making a distinction between the two terms. I consider this to be a good development, as AI is often used as an umbrella term whereas there are many different branches as I have discussed in chapter 3.1. In their definition, the EU furthermore address the notion of machine learning, showing an awareness of the applications:

Many AI technologies require data to improve their performance. Once they perform well, they can help improve and automate decision making in the same domain. For example, an AI system will be trained and then used to spot cyber-attacks on the basis of data from the concerned network or system (European Commission 2018b).

Furthermore, the collocate 'algorithms' is found only in publications from 2018, suggesting algorithms were not a point of interest in relation to artificial intelligence to the EU before this date. Interestingly, whereas 'technologies' is used more often in today's publications, around 1980 to

2000, the word ‘techniques’ is more often used when referring to artificial intelligence technologies. Such as ‘artificial intelligence techniques’ or ‘techniques for artificial intelligence’. There is a change in EU’s terminology concerning AI apparent here.

As I have noted earlier in chapter 4.2.1, ‘artificial intelligence’ is not very apparent in the titles of documents or in the EUROVOC indicators (see also Appendix C5 and C6). The titles of the documents suggest only five out of 361 documents have AI as its main point of discussion. Notably, some documents having artificial intelligence in the title are not included in the EUROVOC documents. However, as the EU has categorised the twelve documents under ‘artificial intelligence’, I would argue these are considered the main documents which discuss AI according to the EU. However, closer examination shows that the 6 out of 12 files do *not* mention AI in the text.¹² Closer examination reveals these frequently mention ‘experts systems’ or ‘information systems’. This is not strange considering the proliferation of expert systems in the 1970s and 1980s.

A:		B:	
Top 15 collocates in entire corpus	Stat	Top 15 collocates in EUROVOC AI	Stat
(1) Intelligence	12.97471	(1) Intelligence	9.42581
(2) Data	6.02171	(2) Cybersecurity	6.72232
(3) Computing	9.57602	(3) Computing	7.58305
(4) Cybersecurity	9.17867	(4) Performance	7.78236
(5) Technologies	7.42212	(5) Digital	3.92503
(6) Performance	7.91562	(6) Advanced	6.36066
(7) Robotics	11.71248	(7) Data	4.64226
(8) Digital	6.54603	(8) Skills	5.11412
(9) Advanced	8.04720	(9) Capacities	5.60953
(10)Big	9.67921	(10)Robotics	7.23513
(11)Internet	8.25382	(11)Objective	6.18450
(12)Techniques	7.57286	(12)Generation	8.13559
(13)Applications	6.62201	(13)Strengthen	7.53152
(14)New	4.13633	(14)World	6.09997
(15)Cloud	7.06400	(15)Services	4.04813

Figure 8. Comparison of the top 15 most frequent collocates (based on the search term ‘artificial intelligence’ between (A) the entire corpus (261 documents, includes all years) and (B) the EUROVOC mention of AI (7 documents, includes documents from only 2017 and 2018). Irrelevant words such as linking words, adverbs etc. are filtered out of this list.

A: Highest Stat A: 13.42545 Lowest Stat A: -0.76262

B: Highest Stat B: 9.45751 Lowest Stat B: 0.3674

Concerning the seven documents including ‘artificial intelligence’ in the EUROVOC indicator (B in Figure 8), it can be observed that the most frequent collocates based on the search term ‘artificial

¹² These include all publications from 1988 and 1989 from Appendix C6.

intelligence' are relatively quite similar to the collocates found in the analysis of the total corpus (A in Figure 8). However, column includes only documents from 2017 and 2018, this is not odd considering the amount of documents from more recent years within the corpus. From Figure 8 however, it is suggested the publications indexed in EUROVOC as 'artificial intelligence' do not differentiate significantly regarding the collocations from the entire corpus. The main associations seem to be 'data', 'robotics', 'computing' and 'cybersecurity', 'digital', 'advanced' and 'performance'.

In "Bankspeak: The Language of World Bank Reports" (2015), Moretti and Pestre examined the rhetoric of financial institutions using quantitative linguistic analysis. They found that policy-making and words ending in -ing were often in close proximity and concluded policies are "always in progress, but also *only* in progress. Many promises, and very few facts" (2015, 99) in which future possibilities are the focus of policy documents. Additionally, in their research they examine the abstraction of social forces in the policy documents. It seems that the corpus analysed in my paper to some extent upholds to this statement. I examined many passages of texts of the possibilities of AI, how it could be used to enhance the digital capacities of the EU and how it is presented as a future solution. Future is the keyword here, as it seems that Artificial Intelligence is still imagined as futuristic in these publications, as was also observed by Natale and Ballatore in the 1950 to 1970s (2017, 1). Imaginaries of course, include futuristic ideas (Jasanoff and Kim 2009, 123) or possibilities, but what makes them sociotechnical imaginaries is their connection to political processes. AI seems to be included in these political processes, but it is talked about as a development in progression.

The European Union lists their goals for Artificial Intelligence for Europe in a fact sheet on their website, published recently in April 2018. They mention their goals for the EU's approach to Artificial Intelligence is based on three pillars: "being ahead of technological developments and encouraging uptake by the public and private sectors", "Prepare for socio-economic changes brought about by AI" and "Ensure an appropriate ethical and legal framework" (European Commission 2018a). The results of the analysis confirm the first pillar. They focus on the technological developments and innovation of AI. Preparations of changes brought about by AI should both include positive and negative changes. But as I concluded earlier, the focus in the publications lies mostly on positive connotations, suggesting utopian thinking. These preparations should therefore pay more attention to the risks and challenges of AI. As such, the third pillar is one that is likely being developed as we speak. However, I could not find distinctive evidence of the ethical and legal frameworks. The need for frameworks was however mentioned within the publications.

It seems though, from my analysis, the terminology on AI has changed throughout the years. The increase of the word 'artificial intelligence' coincides with Elish and boyd's claim of the increase of branding machine learning as AI for example (2017, 5). 'Expert systems' as well is mostly found in

documents from 1980s and 1990s, after which 'artificial intelligence' became more apparent in recent years.

Ultimately, these findings show an overview of the EU's rhetoric on AI. A different point of interest however is the absence of certain statements in the rhetoric, which Foucault deems important for the analysis of discourses (1972, 28). That is, why is it that certain statements prevailed in the discourse and what is not being said? The latter question can be answered partly using the findings. Risks and challenges of Artificial Intelligence are hardly mentioned are the specific incorporations of AI into society. Emerging technologies are accompanied by a certain discourse on these new technologies (boyd and Crawford 2012, 664). I have not examined the entire discourse of course, but I can make some conclusions based on my analysis, which I will discuss in the following chapter.

6. Conclusion & Discussion

This study aimed to shed light on the European government rhetoric on AI, using a combined approach of distant and close reading. It was found that the distribution of EU publications mentioning AI was not divided equally throughout the years, the years 2013 to 2018 making up almost threequarters of the total publications. This suggests that AI is a fast emerging and hyped technology, coinciding with Elish and boyd's claim (2017, 5-11). There furthermore is an unexplainable absence of publications in the years between 2000 and 2011. The type of documents within the corpus vary greatly, but mostly seem to be concentrated around proposals for regulations and acts and communication. This suggests the ongoing policymaking processes regarding AI.

Additionally, using the collocates and concordance tool of AntConc I determined Artificial Intelligence is mainly referred to as an emerging, new and state-of-the-art technology, which is the key solution to solve the problems in the European society. AI is more often connotated with positive rather than negatively implications and the word is frequently found in proximity of other emerging socio-technical phenomena such as Big Data, Blockchain and Cloud Computing. The publications contain few mentions of possible risks or challenges of AI, thus showing a mainly utopian view on AI by the European government. It is however still presented as a technology in development, as the publications show a focus on the future possibilities of AI "for the greater good". This relates to some extent to the notion of sociotechnological imaginaries, which "are associated with active exercises of state power, such as the selection of development priorities, the allocation of funds, the investment in material infrastructures, and the acceptance or suppression of political dissent." (Jasanoff and Kim 2009, 123). The EU's allocation of large funds to AI research for the coming years furthermore shows their desire for innovation and development.

Thus, to come back to my initial research question: *What does a distant reading of online official European government documents addressing Artificial Intelligence reveal about the European government's rhetoric on Artificial Intelligence?* I have examined the ways in which the EU communicates about AI via their online publications and, to some extent, how they do so specifically by using a combined approach. I would argue that there resides a collective framework of utopian thinking about AI within EU's understanding of AI. The distant reading approach has revealed certain patterns within the corpus: AI as new or emerging, AI equals solution, the need to support AI innovation. I would argue, these could be considered discourse metaphors based on Van den Boomen's understanding (2014, 78). These discourse metaphors are framing devices within the EU's discourse on AI. They concern the "assumptions and legitimations" that inform policy-making processes and that will install "standards, rules, norms and procedures" (ibid.) within EU's political strategies on AI. Consequently, my analysis also touched lightly upon the epistemological processes of the EU regarding AI by examining temporal transformations within the corpus. This concerns furthermore what is regarded as truth with respect to AI and how thus knowledge is produced by investing in the development of AI with the assumption from the discourse metaphors as a guide line. That is, the conformation of discourse metaphors such as AI equals solution or AI as a new phenomenon by the EU in their publications will likely inform their next steps and strategies, consequently determining AI research directions.

As a disclaimer, I would like to mention I consider the examination of solely the political domain not adequate into examining notions of the sociotechnological imaginary, as imaginaries are constituted through the interaction of many domains. I could point out a few interesting results of my analysis that coincide with sociotechnological imaginaries of AI, such as the focus on innovation and future possibilities of AI. These however do not give real insights in the constitution of such imaginaries, rather, it gives insights in their institutionalisations or operationalisations, their applications into the political domain. Therefore, I argue that into studying sociotechnological imaginaries one should venture through multiple domains such as corporate, popular media and government. These too are an important part of the construction of imaginaries according to Elish and boyd (2017, 2), Couldry (2017, 236) and Lister et al. (2009, 68). I acknowledge the focus of Jasanoff and Kim to the under theorised political dimension of the study of technology and science, and I wholeheartedly encourage this focus with regard to sociotechnological imaginaries, but in corporation with other domains and focuses.

I have discussed various limitations of my methodology as well as corpus sections earlier in this paper, however it came to my attention while conducting this research that it also shed light on methodological challenges of the distant reading approach. As such, we could take a leap and

rephrase the main research question into: *what does distant reading not reveal about the rhetoric on Artificial Intelligence?* It does not reveal all the various possible interpretations of texts. It does not reveal complete discourses or constructions of sociotechnological imaginaries. Even though distant reading has proven useful to employ on a large corpus, it ultimately also is an approach that is often contested by other scholars as it abstracts inherently qualitative data. I tried to bypass this issue partly by combining distant reading partly with close reading of the fragments of text within AntConc. Therefore, I not only looked for patterns and outliers, but also paid attention to the textual context of words and collocates to be able to make sense of the data. I agree with Ascari and Wilkens that distant and close reading should be a combined approach at all times (2014, 16; 2012, 255), in which I would like to add that this is especially important within the Digital Humanities as the interpretative quality of the Humanities discipline should be preserved. Quantification often takes up the suggestion of objectivity, whereas this is not applicable. The biases of the researcher should be discussed and could even be used to one's advantage. I furthermore consider the use of the distant reading approach to examine sociotechnical imaginaries not sufficient. It needs to be combined with a qualitative approach to better make sense of the text and its connection to the societal and cultural context, preferably a highly qualitative approach such as Critical Discourse Analysis (for example as proposed by Piazza and Wodak 2014). I believe distant reading is a great way to get familiar with the corpus, but for the corpus to be thoroughly examined and interpreted, there is a need to combine both distant and close reading. The need for distant reading within the Digital Humanities however is clear: cultural texts and artefacts are getting larger, but distant reading should be used to point scholars into the direction of interesting patterns and outliers that need to be examined further.

I think I touched upon many interesting findings by using AntConc to examine the publications, which I have discussed briefly, but that could be the focus of further research. In the scope of this research, I examined the European government level. Rather, it could likewise be interesting to conduct a comparative research, taking into consideration the United States and Asian countries. An important critique on academic research conducted in Europe is the lack of diversity and attention to other parts of the world. It is furthermore important to point out sociotechnological imaginaries are not only constituted and preserved by political actors. The interaction between academic, popular media, nongovernment organisations and politics could be another point of interest for scholars. Sociotechnological imaginaries are not only constituted and shaped through political processes, but these actors also play a part in the perseverance of imaginaries. Such a study thus needs extensive research into multiple domains and determine their interactions. A way of conducting this could be done by using the approach of Issue Networks as proposed by Richard Rogers (2002; 2010) and could be informed by Bruno Latour's Actor Network Theory (1996) or theories of the Public Sphere (Habermas et al. 1964; Fraser 1990; Dean 2003; etc.). On a last note,

media framing theories can furthermore help into examining media outlets regarding EU's stance on Artificial Intelligence.

7. Reference list

For clarifying purposes, I have split the reference list in three parts: bibliography for literature either available on paper or online, webography for online articles and other online sources, and lastly the software I mention in the text and/or have utilised during my research.

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8. Appendices

This appendix section contains the larger versions of the graphs from the analysis, as well as tables various full versions of tables mentioned in this paper. In the running text of this paper, I refer to the specific appendix section.

For access to the complete word frequency list, collocates list or texts files of the 361 EU publications, please contact the author. These are available upon request.

8.1 Appendix A

```
folder <- file.path("C:/Users/Krijgsman/Desktop/EU Documents/")
folder
length <- length(dir(folder))
length
dirpdf <-dir(folder)
dirpdf[1]

pdftotext <- "C:/Users/Krijgsman/Desktop/xpdf-tools-win-4.00/bin64/pdftotext.exe"

for (i in 1:length(dir(folder)))
{
  pdf <-file.path("C:/Users/Krijgsman/Desktop/EU Documents/", dirpdf[i])
  system(paste("\", pdftotext, "\" \", pdf, "\"", sep = ""), wait = F)
}
```

Appendix A1: R Script used to convert 361 EU publications from PDFs to text files.

8.2 Appendix B

Number of EU
publications
in dataset,
divided by
year

1977	1
1979	2
1980	1
1982	2
1983	4
1984	6
1985	12
1986	5
1987	4
1988	11
1989	5
1990	4
1991	10
1992	1
1993	4
1994	7
1996	4
1997	1
1998	2
1999	3
2000	1
2005	1
2007	1
2008	2
2009	2
2011	1
2012	3
2013	14
2014	14
2015	3
2016	13
2017	67
2018	150

Appendix B1: Number of EU publications within the corpus in absolute numbers, categorised by year. As can be observed, 2018 has significantly more publications that address Artificial Intelligence then, for example, 2008. Made in Tableau.

Number of document types per year

Budget	1988	2
	1989	1
	1990	1
	2015	1
	2016	1
Call for proposals	1996	1
	1999	1
Common position	2008	1
Communication	1977	2
	1982	2
	1983	1
	1984	1
	1985	3
	1991	1
	1994	1
	1996	1
	1999	1
	2014	1
	2016	3
	2017	14
	2018	19
	Conclusions	2018
Consolidated text	2011	1
	2012	1
	2013	1
	2014	1
	2015	1
	2017	1
	2018	1
Contract notice	1996	2
Corrigendum, Declaration	2018	1
Corrigendum, Joint report	2018	1
Cover note	2017	5
	2018	15
Decision	1984	2
	1985	3
	1987	1
	1988	2
	1989	1
	1990	1
	1991	2
	1994	1
	2007	1
Declaration	2017	1
Exploratory opinion	2017	2
	2018	2
Impact assessment	2013	1
	2017	12
	2018	23
Inception impact assessment	2017	1
	2018	1
International agreement	1985	1
Joint communication	2017	1
Joint report	2018	1
List	1999	1
Minutes	2017	1
Note	2016	1
	2017	1
	2018	9
Opinion	1988	1
	1998	1
	2008	1
	2012	1
	2017	4
	2018	3
Opinion not proposing am..	2016	1
Opinion of the Advocate General	1986	1
	2009	1
	2017	2
Opinion on impact assess..	2018	1

Own-initiative opinion	2005	1	
	2012	1	
	2016	1	
	2017	5	
	2018	2	
Own-initiative report	2000	1	
Own-initiative resolution	2013	1	
	2016	1	
Proposal for a decision	1980	1	
	1985	1	
	1986	1	
	1988	1	
	1989	2	
	1990	1	
	1991	3	
	1994	1	
	2018	2	
Proposal for a decision without addressee	1983	2	
	1989	1	
	1990	1	
Proposal for a directive	2018	2	
Proposal for a recommen..	2018	4	
Proposal for a regulation	1986	1	
	1987	3	
	2017	3	
		2018	17
Proposal for an act	1984	2	
	1985	1	
	2017	3	
	2018	26	
Provisional data	1983	1	
	1984	1	
	1985	3	
	1986	2	
	1988	5	
	1991	2	
	1992	1	
	1993	1	
	1994	1	
	1997	1	
		2013	1
	2014	2	
Recommendation	1991	1	
		2015	1
		2018	1
Reflection paper	2017	5	
Regulation	2009	1	
Report	1979	1	
	1991	1	
	1993	2	
	1994	3	
	1998	1	
		2018	1
Resolution	2017	1	
Roadmap	2018	1	
Staff working document	2013	11	
	2014	10	
	2016	5	
	2017	4	
	2018	14	
Summary of impact asses..	2018	1	
Working document	1993	1	

Appendix B2.1: Number of types of EU publications within the corpus in absolute numbers, categorised by year. Made with Tableau.

Document types in absolute numbers

Form	
Communication	50
Staff working document	44
Impact assessment	36
Proposal for an act	32
Proposal for a regulation	24
Provisional data	21
Cover note	20
Decision	14
Proposal for a decision	13
Note	11
Opinion	11
Own-initiative opinion	10
Report	9
Budget	7
Consolidated text	7
Reflection paper	5
Exploratory opinion	4
Opinion of the Advocate G..	4
Proposal for a decision wi..	4
Proposal for a recommen..	4
Recommendation	3
Call for proposals	2
Contract notice	2
Inception impact assessm..	2
Own-initiative resolution	2
Proposal for a directive	2
Common position	1
Conclusions	1
Corrigendum, Declaration	1
Corrigendum, Joint report	1
Declaration	1
International agreement	1
Joint communication	1
Joint report	1
List	1
Minutes	1
Opinion not proposing am..	1
Opinion on impact assess..	1
Own-initiative report	1
Regulation	1
Resolution	1
Roadmap	1
Summary of impact asses..	1
Working document	1

Appendix B2.2: Number of types of EU publications within the corpus in absolute numbers, categorised by type. Made with Tableau.

A	B	C
1	Form	Date of document
2	Communication	30-6-1977
3	Communication	30-6-1977
4	Report	23-11-1979
5	Proposal for a decision	10-6-1980
6	Communication	26-5-1982
7	Communication	17-8-1982
8	Communication	24-2-1983
9	Proposal for a decision without address	2-6-1983
10	Proposal for a decision without address	14-6-1983
11	Provisional data	28-11-1983
12	Provisional data	13-2-1984
13	Provisional data	23-2-1984
14	Decision	28-2-1984
15	Proposal for an act	14-11-1984
16	Decision	22-11-1984
17	Communication	14-12-1984
18	Communication	11-2-1985
19	Communication	21-3-1985
20	Proposal for a decision	25-3-1985
21	Provisional data	26-4-1985
22	Provisional data	5-6-1985
23	Communication	21-6-1985
24	Communication	30-9-1985
25	Provisional data	1-10-1985
26	Proposal for an act	12-11-1985
27	International agreement	26-11-1985
28	Decision	26-11-1985
29	Decision	10-12-1985
30	Provisional data	15-3-1986
31	Opinion of the Advocate General	25-6-1986
32	Proposal for a regulation	1-8-1986
33	Proposal for a decision	24-9-1986
34	Provisional data	28-10-1986
35	Proposal for a regulation	23-7-1987
36	Proposal for a regulation	24-7-1987
37	Proposal for a regulation	24-7-1987
38	Decision	28-9-1987
39	Provisional data	15-1-1988
40	Provisional data	25-3-1988
41	Provisional data	4-4-1988
42	Provisional data	5-4-1988
43	Provisional data	5-4-1988
44	Decision	11-4-1988
45	Decision	1-6-1988
46	Decision	29-6-1988
47	Proposal for a decision	18-7-1988
48	Opinion	14-12-1988
49	Budget	15-12-1988
50	Proposal for a decision	9-3-1989
51	Proposal for a decision	31-5-1989
52	Decision	20-6-1989
53	Proposal for a decision without address	28-8-1989
54	Budget	13-11-1989

Appendix B3: List of publications in the corpus with name, form (type of document) and date of document. 1 of 7.

	A	B	C
52	89/415/EEC: Council Decision of 20 June 1989 instituting a specific programme for the research and development of statistical expert systems (Doses)	Decision	20-6-1989
53	PROPOSAL FOR A COUNCIL DECISION CONCERNING THE FRAMEWORK PROGRAMME OF COMMUNITY ACTIVITIES IN THE FIELD OF RESEARCH AND TECHNOLOGICAL DEVELOPMENT (1996 Proposal for a decision without address:	Budget	28-8-1989
54	90/26/Euratom, ECSC, EEC: Final Adoption of the general budget of the European Communities for the financial year 1990	Budget	13-12-1989
55	90/221/Euratom, EEC: Council Decision of 23 April 1990 concerning the Framework Programme of Community activities in the field of research and technological development (Decision	Decision	23-4-1990
56	PROPOSAL FOR A COUNCIL DECISION CONCERNING A SPECIFIC PROGRAMME OF RESEARCH AND TECHNOLOGICAL DEVELOPMENT IN THE FIELD OF INFORMATION TECHNOLOGY (1990-1 Proposal for a decision	Budget	23-5-1990
57	91/34/EEC, EC, Euratom: Final Adoption of the general budget of the European Communities for the financial year 1991	Budget	13-12-1990
58	AMENDMENT TO THE PROPOSAL FOR A COUNCIL DECISION ON A SPECIFIC PROGRAMME OF RESEARCH AND TECHNOLOGICAL DEVELOPMENT IN THE FIELD OF COMMUNICATION TECHNOLOGY	Proposal for a decision without address:	14-12-1990
59	Minutes of the sitting of Wednesday, 12 December 1990	Provisional data	31-1-1991
60	ANNUAL REPORT BY THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL ON THE SETTING UP OF THE CADRIA COMPUTERIZED TELECOMMUNICATIONS SYSTEMS AND	Report	31-1-1991
61	91/337/EEC: Commission Recommendation of 6 May 1991 concerning the harmonization within the Community of research and technological development databases	Recommendation	6-5-1991
62	91/332/EEC: Council Decision of 7 June 1991 adopting a specific research and technological development programme in the field of communication technologies (1990 to 1994)	Decision	7-6-1991
63	Call for proposals for the specific programme of research and technology development in the field of communications technologies	Provisional data	12-6-1991
64	91/394/EEC: Council Decision of 8 July 1991 adopting a specific research and technological development programme in the field of information technologies (1990 to 1994)	Decision	8-7-1991
65	COMMUNICATION FROM THE COMMISSION TO THE COUNCIL RELATING TO A COUNCIL RESOLUTION CONCERNING ACTIVITIES TO BE UNDERTAKEN BY THE JOINT RESEARCH CENTRE (JRC) COMMUNICATION	JRC communication	22-7-1991
66	PROPOSAL FOR A COUNCIL DECISION ADOPTING SPECIFIC RESEARCH PROGRAMMES TO BE IMPLEMENTED BY THE JOINT RESEARCH CENTRE FOR THE EUROPEAN ECONOMIC COMMUNITY	Proposal for a decision	22-7-1991
67	PROPOSAL FOR A COUNCIL DECISION ADOPTING SPECIFIC RESEARCH PROGRAMMES TO BE IMPLEMENTED BY THE JOINT RESEARCH CENTRE FOR THE EUROPEAN ATOMIC ENERGY COMMUNITY	Proposal for a decision	22-7-1991
68	PROPOSAL FOR A COUNCIL DECISION ADOPTING A SUPPLEMENTARY RESEARCH PROGRAMME TO BE IMPLEMENTED BY THE JOINT RESEARCH CENTRE FOR THE EUROPEAN ATOMIC ENERGY	Proposal for a decision	22-7-1991
69	Minutes of the sitting of Friday, 10 July 1992	Provisional data	21-9-1992
70	R & D IN ADVANCED COMMUNICATIONS TECHNOLOGIES FOR EUROPE (RACE) - FINAL REPORT ON PHASE I (1988-1992) OF THE 10-YEAR RACE PROGRAMME	Report	30-3-1993
71	Minutes of the sitting of Wednesday, 23 June 1993	Provisional data	19-7-1993
72	WORKING DOCUMENT OF THE COMMISSION CONCERNING THE S AND T CONTENT OF THE SPECIFIC PROGRAMMES IMPLEMENTING THE 4TH FRAMEWORK PROGRAMME FOR COMMUNITY	Working document	6-10-1993
73	FOURTH ANNUAL REPORT FROM THE COMMISSION ON THE IMPLEMENTATION OF THE REFORM OF THE STRUCTURAL FUNDS - 1992	Report	29-10-1993
74	Proposal for a COUNCIL DECISION adopting a specific research and technological development programme in the field of industrial and materials technologies (1994-1998)	Proposal for a decision	30-3-1994
75	SITE VISIT PROGRAMME - ANNUAL REPORT - ACADEMIC YEAR 1992/93 - 'Tempus PHARE' - Trans-European cooperation scheme for higher education between Central and Eastern Europe	Report	22-4-1994
76	XIIIIRD COMPETITION REPORT FROM THE COMMISSION - 1993	Report	5-5-1994
77	REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT - R&D In Advanced Communications Technologies For Europe (RACE) - Mid-term Report on Phase Report	Report	14-7-1994
78	94/571/EC: Council Decision of 27 July 1994 adopting a specific programme for research and technological development, including demonstration, in the field of industrial and Decision	Provisional data	27-7-1994
79	Written question with answer	Provisional data	29-8-1994
80	COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT Final evaluation of the results of Eurotra: a specific programme concerning the pre-Communication	Contract notice	21-9-1994
81	Statistical services	Contract notice	24-5-1996
82	Research work General Invitation to tender Invitation to tender for selection of organizations or individuals to undertake research work relating to various thematic domain	Contract notice	24-5-1996
83	MARTRANS project (VII/19/96) Open procedure	Call for proposals	28-6-1996
84	COMMUNICATION FROM THE COMMISSION - 'INVENTING TOMORROW' Europe's research at the service of its people"	Communication	10-7-1996
85	Index of goods listed in Annex I to Council Decision 96/613/CFSP on 22 October 1996 amending Decision 94/942/CFSP on the joint action adopted by the Council on the basis of Provisional data	Communication	28-2-1997
86	Research and technological development activities of the European Union - 1998 Annual Report	Report	15-7-1998
87	Opinion of the Economic and Social Committee on : - the Fifth Framework Programme for Research and Technological Development (1998-2002) (Commission Working Paper o	Opinion	10-9-1998
88	Index of goods listed in Annex I to Council Decision 1999/193/CFSP of 9 March 1999 amending Decision 94/942/CFSP on the joint action adopted by the Council on the basis of List	List	12-8-1999
89	Communication from the Commission to the Council and the European Parliament - The creation of the single European sky	Communication	1-12-1999
90	Call for proposals for indirect RTD actions under the specific programme for research, technological development and demonstration on Improving the human research pote	Call for proposals	1-12-1999
91	European Parliament resolution on the communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee	Own-initiative report	18-5-2000
92	Opinion of the European Economic and Social Committee on 'The Perspectives of European Coal and Steel Research'	Own-initiative opinion	13-7-2005
93	2008/354/EC: Commission Decision of 11 December 2007 on State Aid C 47/06 (ex N 648/05) Tax credit introduced by France for the creation of video games (notified under doc	Decision	11-12-2007
94	Opinion of the European Economic and Social Committee on The Internet of Things	Opinion	18-9-2008
95	Common Position (EC) No 4/2009 of 17 December 2008 adopted by the Council, acting in accordance with the procedure referred to in Article 251 of the Treaty establishing the Common position	Common position	17-12-2008
96	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or Regulation	Regulation	16-9-2009
97	Opinion of Advocate General Sharpston delivered on 15 October 2009 (European Commission v The Bavarian Lager Co. Ltd) (Appeal - Access to the documents of the Institute of the Advocate General	Opinion of the Advocate General	15-10-2009
98	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or Consolidated text	Regulation	11-1-2011
99	Opinion of the European Economic and Social Committee on the Proposal for a Regulation of the European Parliament and of the Council on online dispute resolution for c Opinion	Opinion	28-3-2012
100	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or Consolidated text	Regulation	28-6-2012
101	Opinion of the European Economic and Social Committee on the 7 th Need for a European Defence Industry: Industrial, Innovative and social aspects? (own-initiative opinion)	Own-initiative opinion	11-7-2012
102	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or Consolidated text	Regulation	8-1-2013
103	Written questions by Members of the European Parliament and their answers given by a European Union institution	Provisional data	3-7-2013
104	COMMISSION STAFF WORKING DOCUMENT Impact assessment Accompanying the document Proposal for a decision of the European Parliament and of the Council on the part impact assessment	Provisional data	10-7-2013
	105.COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH ADEA.FACTS.AND.FIGURES.2013.Acknowledging the document REPORT FROM THE COMMISSION TO THE COUNCIL AND THE PARLIAMENT	Provisional data	20-9-2013

Appendix B3: List of publications in the corpus with name, form (type of document) and date of document. 2 of 7.

	A	B	C
103	Written questions by Members of the European Parliament and their answers given by a European Union Institution	Provisional data	3-7-2013
104	COMMISSION STAFF WORKING DOCUMENT Impact assessment Accompanying the document Proposal for a decision of the European Parliament and of the Council on the partial impact assessment	Impact assessment	10-7-2013
105	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
106	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
107	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
108	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
109	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
110	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
111	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
112	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
113	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
114	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
115	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2013 Accompanying the document REPORT FROM THE COMMISSION TO THE COUNCIL AN Staff working document	Staff working document	20-9-2013
116	European Parliament resolution of 21 November 2013 on the European Defence Technological and Industrial Base (2013/2125(INI))	Own-initiative resolution	21-11-2013
117	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or consolidated text	Consolidated text	1-1-2014
118	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	2-7-2014
119	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
120	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
121	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
122	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
123	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
124	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
125	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
126	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
127	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
128	COMMISSION STAFF WORKING DOCUMENT EUROPEAN RESEARCH AREA FACTS AND FIGURES 2014 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE CC Staff working document	Staff working document	15-9-2014
129	Written questions by Members of the European Parliament and their answers given by a European Union Institution	Provisional data	30-9-2014
130	Written questions by Members of the European Parliament and their answers given by a European Union Institution	Provisional data	9-10-2014
131	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or consolidated text	Consolidated text	1-1-2015
132	EDPS recommendations on the EU's options for data protection reform	Recommendation	12-9-2015
133	Definitive adoption (EU, Euratom) 2016/150 of the European Union's general budget for the financial year 2016	Budget	25-11-2015
134	COMMISSION STAFF WORKING DOCUMENT Accompanying the document Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Communication	Staff working document	19-1-2016
135	COMMISSION STAFF WORKING DOCUMENT Accompanying the document Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Communication	Staff working document	19-1-2016
136	COMMISSION STAFF WORKING DOCUMENT Accompanying the document Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: Communication	Staff working document	19-1-2016
137	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	19-4-2016
138	COMMISSION STAFF WORKING DOCUMENT Advancing the Internet of Things in Europe Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Staff working document	19-4-2016
139	COMMISSION STAFF WORKING DOCUMENT Online Platforms Accompanying the document Communication on Online Platforms and the Digital Single Market	Staff working document	25-5-2016
140	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	10-6-2016
141	Opinion of the European Economic and Social Committee on 'Industry 4.0 and digital transformation: where to go?' (COM(2016) 180 final)	Opinion not proposing amendment	14-7-2016
142	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	14-9-2016
143	European Parliament resolution of 15 September 2016 on application of Council Directive 2000/78/EC of 27 November 2000 establishing a general framework for equal treatment in the workplace	Own-initiative resolution	15-9-2016
144	Opinion of the European Committee of the Regions ? Digitising European Industry	Own-initiative opinion	11-10-2016
145	Review of the Regulatory Framework Proposal for a Directive of the EP and of the Council establishing the European Electronic Communications Code (Recast) Proposal for a Directive	Note	18-11-2016
146	Definitive adoption (EU, Euratom) 2017/292 of the European Union's general budget for the financial year 2017	Budget	1-12-2016
147	COMMISSION STAFF WORKING DOCUMENT on the free flow of data and emerging issues of the European data economy Accompanying the document Communication Building Staff working document	Staff working document	10-1-2017
148	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council concerning impact assessment	Impact assessment	10-1-2017
149	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council concerning impact assessment	Impact assessment	10-1-2017
150	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council concerning impact assessment	Impact assessment	10-1-2017
151	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning impact assessment	Impact assessment	16-1-2017
152	Opinion of Advocate General Wathelet delivered on 9 February 2017 #Jean-Philippe Lahogue v. Ordre des avocats du barreau de Lyon and others Request for a preliminary ruling	Opinion of the Advocate General	9-2-2017
153	Minutes of the sitting of 16 February 2017	Minutes	16-2-2017
154	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or consolidated text	Consolidated text	11-4-2017
155	Opinion of the European Economic and Social Committee on the 'Digitalisation and innovative business models in the European financial sector: impact on employment and own-initiative opinion	Own-initiative opinion	26-4-2017

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154	Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 of Consolidated text			11-4-2017
155	Opinion of the European Economic and Social Committee on the Digitalisation and Innovative business models in the European financial sector, Impact on employment and Own-Initiative opinion			26-4-2017
156	REFLECTION PAPER ON THE SOCIAL DIMENSION OF EUROPE			26-4-2017
157	REFLECTION PAPER ON THE SOCIAL DIMENSION OF EUROPE			26-4-2017
158	REFLECTION PAPER ON THE SOCIAL DIMENSION OF EUROPE			26-4-2017
159	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			10-5-2017
160	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			10-5-2017
161	REFLECTION PAPER ON HARNESSING GLOBALISATION			10-5-2017
162	COMMISSION STAFF WORKING DOCUMENT Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			10-5-2017
163	Opinion of Advocate General Szpunar delivered on 11 May 2017 <i>Asociación Profesional Elite Taxi v Uber Systems Spain, SL</i> Request for a preliminary ruling from the Juzgado Opinion of the Advocate General			11-5-2017
164	Opinion of the European Economic and Social Committee on Artificial Intelligence: The consequences of artificial intelligence on the (digital) single market, production, cOwn-Initiative opinion			31-5-2017
165	COMMISSION STAFF WORKING DOCUMENT Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			31-5-2017
166	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			7-6-2017
167	REFLECTION PAPER ON THE FUTURE OF EUROPEAN DEFENCE			7-6-2017
168	COMMISSION STAFF WORKING DOCUMENT Economic Analysis Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			8-6-2017
169	Opinion of the European Economic and Social Committee on the Digitalisation and Innovation in the European Parliament, the Council, the European Economic and Social Committee and Opinion			5-7-2017
170	Opinion of the European Economic and Social Committee on Implications of the digitalisation and robotisation of transport for EU policy-making? (own-initiative opinion)			5-7-2017
171	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMISSION AND THE COMMITTEE OF THE REGION: Communication			13-9-2017
172	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMISSION AND THE COMMITTEE OF THE REGION: Communication			13-9-2017
173	JOINT COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Resilience, Deterrence and Defence: Building strong cybersecurity for the EU			13-9-2017
174	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for screening of foreign direct investments into the European Union Proposal for a regulation			13-9-2017
175	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for screening of foreign direct investments into the European Union Proposal for a regulation			13-9-2017
176	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a framework for the free flow of non-personal data in the European Union			13-9-2017
177	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Directive of the European Parliament and the Council on combating impact assessment			13-9-2017
178	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on a fair impact assessment			13-9-2017
179	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on a fair impact assessment			13-9-2017
180	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Impact assessment			14-9-2017
181	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Impact assessment			14-9-2017
182	ANNEX TO THE PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for screening of foreign direct investments into the Proposal for an act			14-9-2017
183	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for screening of foreign direct investments into the European Union Proposal for an act			14-9-2017
184	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Directive of the European Parliament and the Council on combating Cover note			14-9-2017
185	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Cover note			14-9-2017
186	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Impact assessment			15-9-2017
187	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on a fair cover note			15-9-2017
188	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT ANNEXES TO THE IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on a fair cover note			15-9-2017
189	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a framework for the free flow of non-personal data in the European Union			15-9-2017
190	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Impact assessment			16-9-2017
191	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Impact assessment			17-9-2017
192	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL Impact assessment			18-9-2017
193	Opinion of the European Economic and Social Committee on the Provision and development of skills, including digital skills, in the context of new forms of work: new public Exploratory opinion			20-9-2017
194	Opinion of the European Economic and Social Committee on The role and opportunities of social partners and other civil society organisations in the context of new forms: Exploratory opinion			20-9-2017
195	Opinion of the European Economic and Social Committee on The impact of the digital healthcare revolution on health insurance? (own-initiative opinion)			20-9-2017
196	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL A Fair and Efficient Tax System in the European Union for the Digital Single Market Communication			21-9-2017
197	Opinion of the European Economic and Social Committee on The transition towards a more sustainable European future? a strategy for 2050? (own-initiative opinion)			18-10-2017
198	Opinion of the European Economic and Social Committee on The Digitalisation and Innovation in the European Parliament, the Council, the European Economic and Social Committee and Opinion			18-10-2017
199	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
200	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
201	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
202	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
203	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
204	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
205	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			24-10-2017
206	Resolution by the European Parliament on lethal autonomous weapons systems			1-11-2017
207	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication			14-11-2017

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205 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication		24-10-2017
206 Resolution by the European Parliament on lethal autonomous weapons systems	Resolution	1-11-2017
207 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	14-11-2017
208 Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union - Policy debate	Note	17-11-2017
209 Definitive adoption (EU, Euratom) 2018/251 of the European Union's general budget for the financial year 2018	Budget	30-11-2017
210 Opinion of the European Economic and Social Committee on the 'European Defence Industrial Development Programme' (COM(2017) 294 final)	Opinion	7-12-2017
211 Opinion of the European Economic and Social Committee on 'Launching the European Defence Fund' (COM(2017) 295 final)	Opinion	7-12-2017
212 Development of digital tools for compliance with inland waterway transport legislations	Inception Impact assessment	15-12-2017
213 Joint Declaration on the EU's legislative priorities for 2018-2019	Declaration	29-12-2017
214 Regulation (EC) No 987/2009 of the European Parliament and of the Council of 16 September 2009 laying down the procedure for implementing Regulation (EC) No 883/2004 or Consolidated text	Consolidated text	1-1-2018
215 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Council Regulation on establishing the European High Performance Impact assessment	Impact assessment	11-1-2018
216 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Council Regulation on establishing the European High Performance Impact assessment	Impact assessment	11-1-2018
217 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Council Regulation on establishing the European High Performance Impact assessment	Impact assessment	11-1-2018
218 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Council Regulation on establishing the European High Performance Impact assessment	Impact assessment	11-1-2018
219 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Council Regulation on establishing the European High Performance Impact assessment	Impact assessment	11-1-2018
220 Corrigendum to Joint Declaration on the EU's legislative priorities for 2018-2019 (OJ C 446, 29.12.2017)	Corrigendum, Declaration	13-1-2018
221 Opinion of the European Economic and Social Committee on 'Adopting a comprehensive approach to industrial policy in the EU? Improving business environment and supp	Exploratory opinion	17-1-2018
222 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	17-1-2018
223 Proposal for a COUNCIL RECOMMENDATION on Key Competences for Lifelong Learning	Proposal for a recommendation	17-1-2018
224 Proposal for a COUNCIL RECOMMENDATION on Key Competences for Lifelong Learning	Proposal for a recommendation	17-1-2018
225 COMMISSION STAFF WORKING DOCUMENT Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Communication	Staff working document	17-1-2018
226 COMMISSION STAFF WORKING DOCUMENT Accompanying the document Proposal for a COUNCIL RECOMMENDATION on Key Competences for Lifelong Learning	Staff working document	17-1-2018
227 Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the European Defence Industrial Development Programme aiming at supporting	Cover note	18-1-2018
228 COMMISSION STAFF WORKING DOCUMENT Accompanying the document Proposal for a COUNCIL RECOMMENDATION on Key Competences for Lifelong Learning	Cover note	18-1-2018
229 ANNEX to the Proposal for a Council Recommendation on Key Competences for Lifelong Learning	Proposal for an act	18-1-2018
230 Proposal for a COUNCIL RECOMMENDATION on Key Competences for Lifelong Learning	Proposal for an act	18-1-2018
231 Opinion of the European Economic and Social Committee on 'Lessons learned for avoiding the severity of austerity policies in the EU? (own-initiative opinion)	Own-initiative opinion	14-2-2018
232 Opinion of the European Economic and Social Committee on 'In-depth change in the health sector? (own-initiative opinion)	Own-initiative opinion	14-2-2018
233 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL AND THE COUNCIL A new, modern Multiannual Financial Framework for a Eur	Communication	14-2-2018
234 Opinion of the European Economic and Social Committee on the 'Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow o	Opinion	15-2-2018
235 Opinion of the European Economic and Social Committee on the 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social	Opinion	15-2-2018
236 COMMISSION STAFF WORKING DOCUMENT Country Report Denmark 2018 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Staff working document	7-3-2018
237 COMMISSION STAFF WORKING DOCUMENT Country Report France 2018 including an In-Depth Review on the prevention and correction of macroeconomic imbalances Accompa	Staff working document	7-3-2018
238 COMMISSION STAFF WORKING DOCUMENT Country Report Croatia 2018 including an In-Depth Review on the prevention and correction of macroeconomic imbalances Accompa	Staff working document	7-3-2018
239 COMMISSION STAFF WORKING DOCUMENT Country Report Austria 2018 Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Staff working document	7-3-2018
240 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	7-3-2018
241 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	8-3-2018
242 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	8-3-2018
243 Opinion of the European Economic and Social Committee on the 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social	Opinion	14-3-2018
244 Opinion of the European Economic and Social Committee on the 'Future of work? Acquiring of appropriate knowledge and skills to meet the needs of future jobs? (Explorat	Exploratory opinion	15-3-2018
245 Communication from the Commission on Improving Health Security in the EU? A one health approach to countering the threat from infectious diseases	Roadmap	19-3-2018
246 Legislative proposal to create a cybersecurity competence network with a European Cybersecurity Research and Competence Centre	Inception Impact assessment	22-3-2018
247 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL AND THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE A New Deal for Consumers	Communication	11-4-2018
248 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL AND THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	25-4-2018
249 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	25-4-2018
250 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	25-4-2018
251 Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the re-use of public sector information (recast)	Proposal for a directive	25-4-2018
252 Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the re-use of public sector information (recast)	Proposal for a directive	25-4-2018
253 COMMISSION STAFF WORKING DOCUMENT Guidance on sharing private sector data in the European data economy Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Staff working document	25-4-2018
254 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Staff working document	25-4-2018
255 COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the re-use of pu	Staff working document	25-4-2018
256 COMMISSION STAFF WORKING DOCUMENT Liability for emerging digital technologies Accompanying the document COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Staff working document	25-4-2018
257 COMMISSION STAFF WORKING DOCUMENT EVALUATION Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the re-use of pu	Staff working document	25-4-2018
258 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGION: Communication	Communication	26-4-2018

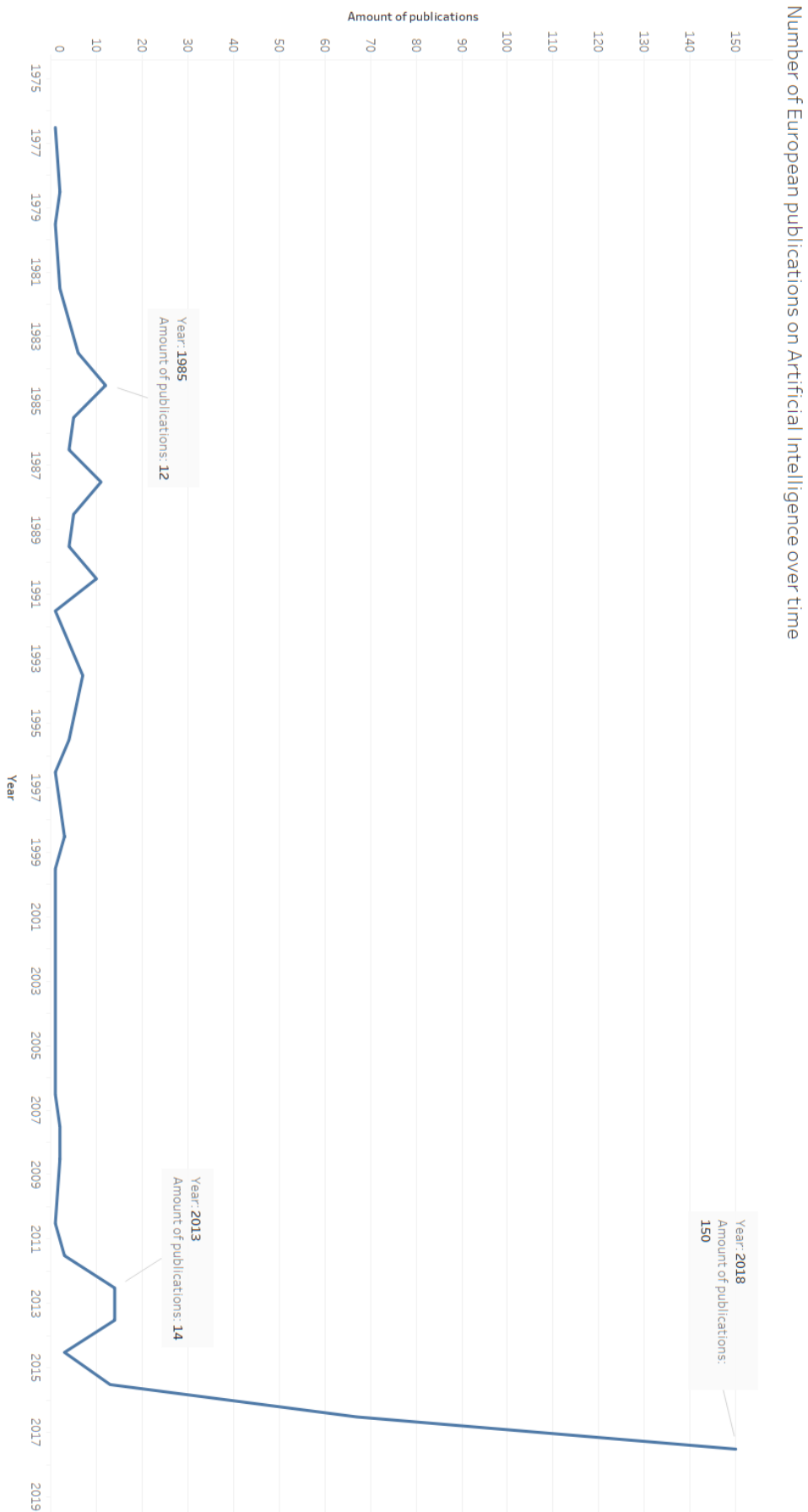
Appendix B3: List of publications in the corpus with name, form (type of document) and date of document. 5 of 7.

	A	B	C
256	COMMISSION STAFF WORKING DOCUMENT Liability for emerging digital technologies Accompanying the document Communication from the Commission to the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for an act	25-4-2018
257	COMMISSION STAFF WORKING DOCUMENT EVALUATION Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	25-4-2018
258	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Proposal for a regulation	26-4-2018
259	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the promotion of the digital skills of citizens	Proposal for a regulation	26-4-2018
260	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the promotion of the digital skills of citizens	Proposal for a regulation	26-4-2018
261	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the promotion of the digital skills of citizens	Proposal for a regulation	30-4-2018
262	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Proposal for a regulation	2-5-2018
263	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Proposal for a regulation	2-5-2018
264	Proposal for a Council Recommendation on Key Competences for Lifelong Learning - Adoption	Note	2-5-2018
265	Proposal for a Directive of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for an act	2-5-2018
266	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	2-5-2018
267	COMMISSION STAFF WORKING DOCUMENT EVALUATION Accompanying the document Proposal for a Directive of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	2-5-2018
268	REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL AND THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE on the Application of the Council Directive Report	Report	7-5-2018
269	COMMISSION STAFF WORKING DOCUMENT Evaluation of Council Directive 85/374/EEC of 25 July 1985 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the harmonisation of the technical specifications for the design, construction and approval of lifting devices	Working document	7-5-2018
270	COMMISSION STAFF WORKING DOCUMENT STAKEHOLDER CONSULTATION - SYNOPSIS REPORT Accompanying the document Report from the Commission to the European Parliament and of the Council on the implementation of the Directive on the harmonisation of the technical specifications for the design, construction and approval of lifting devices	Working document	7-5-2018
271	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Communication	15-5-2018
272	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Communication	15-5-2018
273	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Communication	15-5-2018
274	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE, THE COMMITTEE OF THE REGIONS ON Communication	Communication	17-5-2018
275	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS ON Communication	Communication	17-5-2018
276	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS ON Communication	Communication	17-5-2018
277	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS ON Communication	Communication	17-5-2018
278	Council Recommendation of 22 May 2018 on key competences for lifelong learning (Text with EEA relevance)	Recommendation	22-5-2018
279	COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Communication	Communication	22-5-2018
280	Proposal for a Council Recommendation on promoting automatic mutual recognition of higher education and upper secondary education diplomas and the outcomes of learning	Proposal for a recommendation	22-5-2018
281	Proposal for a Council Recommendation on promoting automatic mutual recognition of higher education and upper secondary education diplomas and the outcomes of learning	Proposal for a recommendation	22-5-2018
282	COMMISSION STAFF WORKING DOCUMENT A New European Agenda for Culture - Background Information Accompanying the document Communication from the European Commission	Staff working document	23-5-2018
283	Council Recommendation on Key Competences for Lifelong Learning	Note	23-5-2018
284	Proposal for a Council Recommendation on promoting automatic mutual recognition of higher education and upper secondary education diplomas and the outcomes of learning	Proposal for an act	24-5-2018
285	Proposal for a Directive of the European Parliament and of the Council on the re-use of public sector information (Recast) - Policy debate	Note	25-5-2018
286	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	30-5-2018
287	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	30-5-2018
288	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	30-5-2018
289	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	30-5-2018
290	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	30-5-2018
291	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	30-5-2018
292	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	30-5-2018
293	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	30-5-2018
294	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	31-5-2018
295	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for an act	31-5-2018
296	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	31-5-2018
297	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for an act	31-5-2018
298	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	31-5-2018
299	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	31-5-2018
300	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
301	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
302	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
303	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
304	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
305	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
306	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
307	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
308	Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Proposal for a regulation	6-6-2018
309	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on the re-use of public sector information (Recast)	Impact assessment	6-6-2018

Appendix B3: List of publications in the corpus with name, form (type of document) and date of document. 6 of 7.

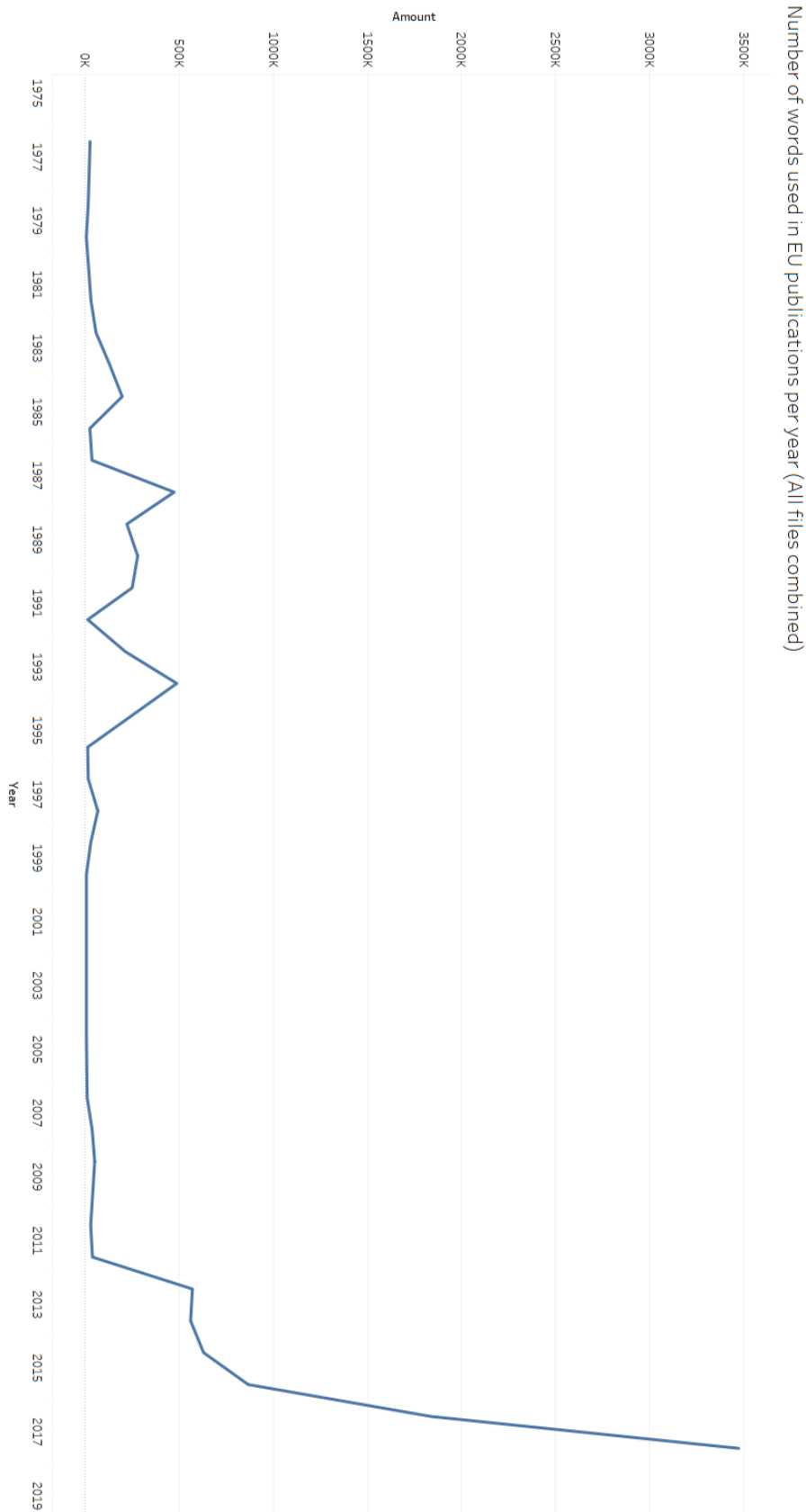
A		B	C
306	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the InvestEU Programme	Proposal for a regulation	6-5-2018
307	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the space programme of the Union and the European Union Agency for the Space Programme and repe	Proposal for a regulation	6-5-2018
308	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the space programme of the Union and the European Union Agency for the Space Programme and repe	Proposal for a regulation	6-5-2018
309	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europ	Impact assessment	6-5-2018
310	COMMISSION STAFF WORKING DOCUMENT EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council e	Summary of impact assessment	6-5-2018
311	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and the Council establishing the Connecting Eur	Impact assessment	6-5-2018
312	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Invest	Impact assessment	6-5-2018
313	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the spa	Impact assessment	6-5-2018
314	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the spa	Impact assessment	6-5-2018
315	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Council Regu	Cover note	6-5-2018
316	Proposal for a COUNCIL REGULATION on establishing the European High Performance Computing Joint Undertaking and Statutes of the EuroHPC Joint Undertaking - Draft general approach	Note	6-5-2018
317	Opinion of the Regulatory Scrutiny Board		
318	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe 2 the Framework Programme for Research and Innovation, laying down its rules for pai	Proposal for a regulation	7-5-2018
319	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe 2 the Framework Programme for Research and Innovation, laying down its rules for pai	Proposal for a regulation	7-5-2018
320	Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on establishing the specific programme implementing Horizon Europe 2 the Framework Programme for Research and I	Proposal for a decision	7-5-2018
321	Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on establishing the specific programme implementing Horizon Europe 2 the Framework Programme for Research and I	Proposal for a decision	7-5-2018
322	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Programme for single market, competitiveness of enterprises, including small and medium-sized	Proposal for a regulation	7-5-2018
323	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Programme for single market, competitiveness of enterprises, including small and medium-sized	Proposal for a regulation	7-5-2018
324	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Impact assessment	7-5-2018
325	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Impact assessment	7-5-2018
326	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Impact assessment	7-5-2018
327	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Pro	Impact assessment	7-5-2018
328	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Pro	Impact assessment	7-5-2018
329	Council conclusions on moving towards a vision of a European Education Area	Conclusions	7-5-2018
330	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Custo	Impact assessment	8-5-2018
331	ANNEXES to the Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe 2 the Framework Programme for Research and Innovation, laying down	Proposal for an act	8-5-2018
332	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Proposal for an act	8-5-2018
333	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Proposal for an act	8-5-2018
334	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe 2 the Framework Programme for Research and Innovation, laying down its rules for pai	Proposal for an act	8-5-2018
335	ANNEXES to the Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on establishing the specific programme implementing Horizon Europe 2 the Framework Programme for	Proposal for an act	8-5-2018
336	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Proposal for an act	8-5-2018
337	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Proposal for an act	8-5-2018
338	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Proposal for an act	8-5-2018
339	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposals for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon	Proposal for an act	8-5-2018
340	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Pro	Proposal for an act	8-5-2018
341	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Pro	Proposal for an act	8-5-2018
342	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Programme for single market, competitiveness of enterprises, including small and medium-sized	Proposal for an act	8-5-2018
343	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Programme for single market, competitiveness of enterprises, including small and medium-sized	Proposal for an act	8-5-2018
344	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the spa	Proposal for an act	8-5-2018
345	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and the Council establishing the Connecting Eur	Cover note	11-5-2018
346	ANNEX to the Proposal for a Regulation of the European Parliament and of the Council establishing the InvestEU Programme	Proposal for an act	11-5-2018
347	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Invest	Cover note	11-5-2018
348	Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the InvestEU Programme	Proposal for an act	11-5-2018
349	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Custo	Proposal for an act	12-5-2018
350	Proposal for a Regulation of the European Parliament and of the Council on a framework for the free flow of non-personal data in the European Union - Discussion on the EP amendments	Note	12-5-2018
351	JOINT REPORT TO THE EUROPEAN PARLIAMENT THE EUROPEAN COUNCIL AND THE COUNCIL on the implementation of the Joint Framework on countering hybrid threats from July 2017 to June 2018	Joint report	13-5-2018
352	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Europ	Impact assessment	13-5-2018
353	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Europ	Impact assessment	13-5-2018
354	Proposal for a COUNCIL REGULATION on establishing the European High Performance Computing Joint Undertaking and Statutes of the EuroHPC Joint Undertaking - Preparation for general appro	Proposal for an act	14-5-2018
355	ANNEXES to the PROPOSAL FOR A REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Digital Europe Programme for the period 2021-2027	Proposal for an act	14-5-2018
356	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europ	Cover note	14-5-2018
357	COMMISSION STAFF WORKING DOCUMENT EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council e	Cover note	14-5-2018
358	COMMISSION STAFF WORKING DOCUMENT EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council e	Proposal for an act	14-5-2018
359	Proposal for a COUNCIL REGULATION on establishing the European High Performance Computing Joint Undertaking and Statutes of the EuroHPC Joint Undertaking - Preparation for general appro	Note	18-5-2018
360	Proposal for a COUNCIL REGULATION on establishing the European High Performance Computing Joint Undertaking and Statutes of the EuroHPC Joint Undertaking - Preparation for general appro	Note	18-5-2018
361	JOINT REPORT TO THE EUROPEAN PARLIAMENT THE EUROPEAN PARLIAMENT AND THE COUNCIL on the implementation of the Joint Framework on countering hybrid threats from July 2017 to June 2018	Corrigendum, Joint report	20-5-2018
362	Proposal for a COUNCIL REGULATION on establishing the European High Performance Computing Joint Undertaking and Statutes of the EuroHPC Joint Undertaking - General approach	Note	22-5-2018

Appendix B3: List of publications in the corpus with name, form (type of document) and date of document. 7 of 7.

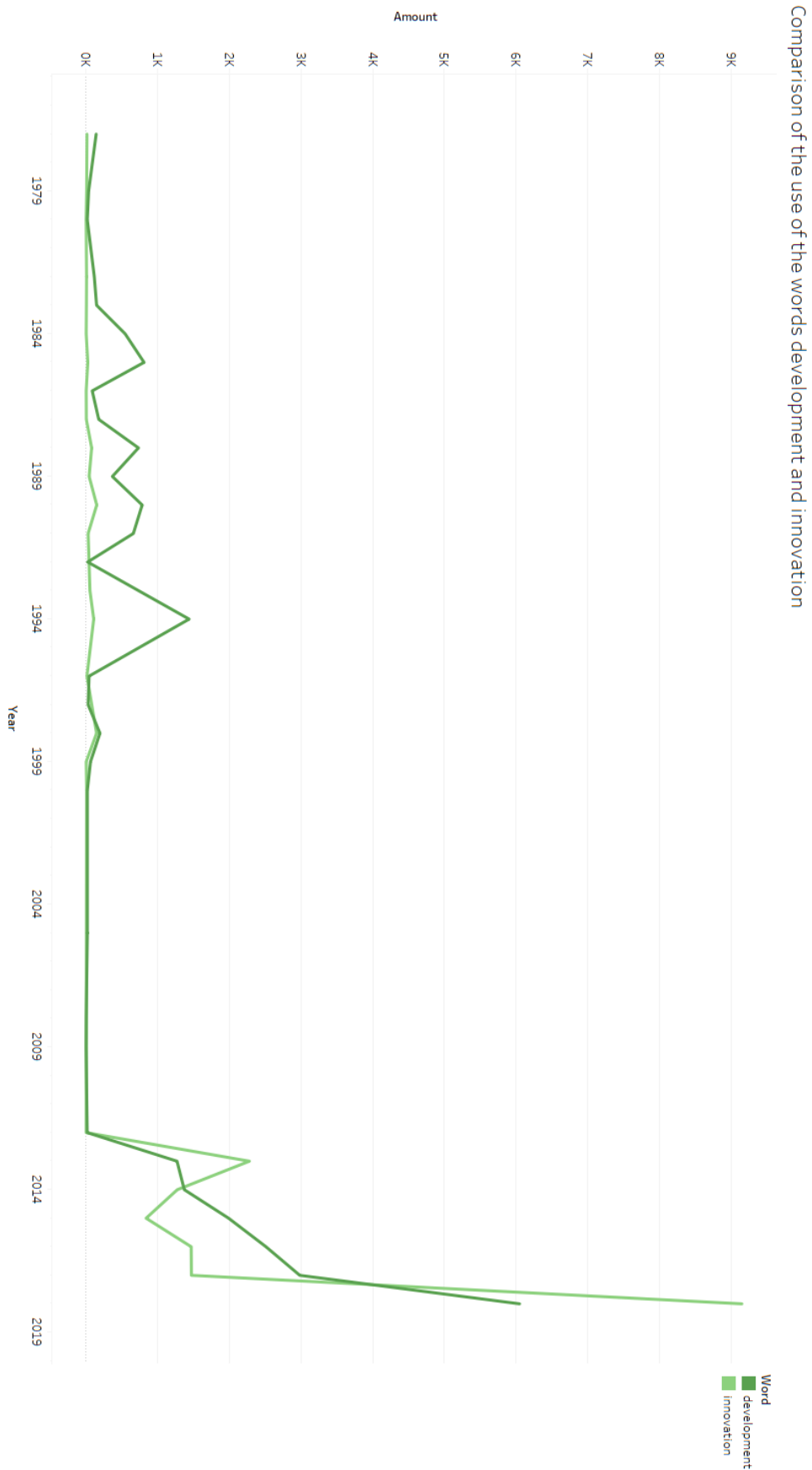


Appendix B4: Timeline of the number of EU publications within the corpus in absolute numbers, categorised by year. Made in Tableau.

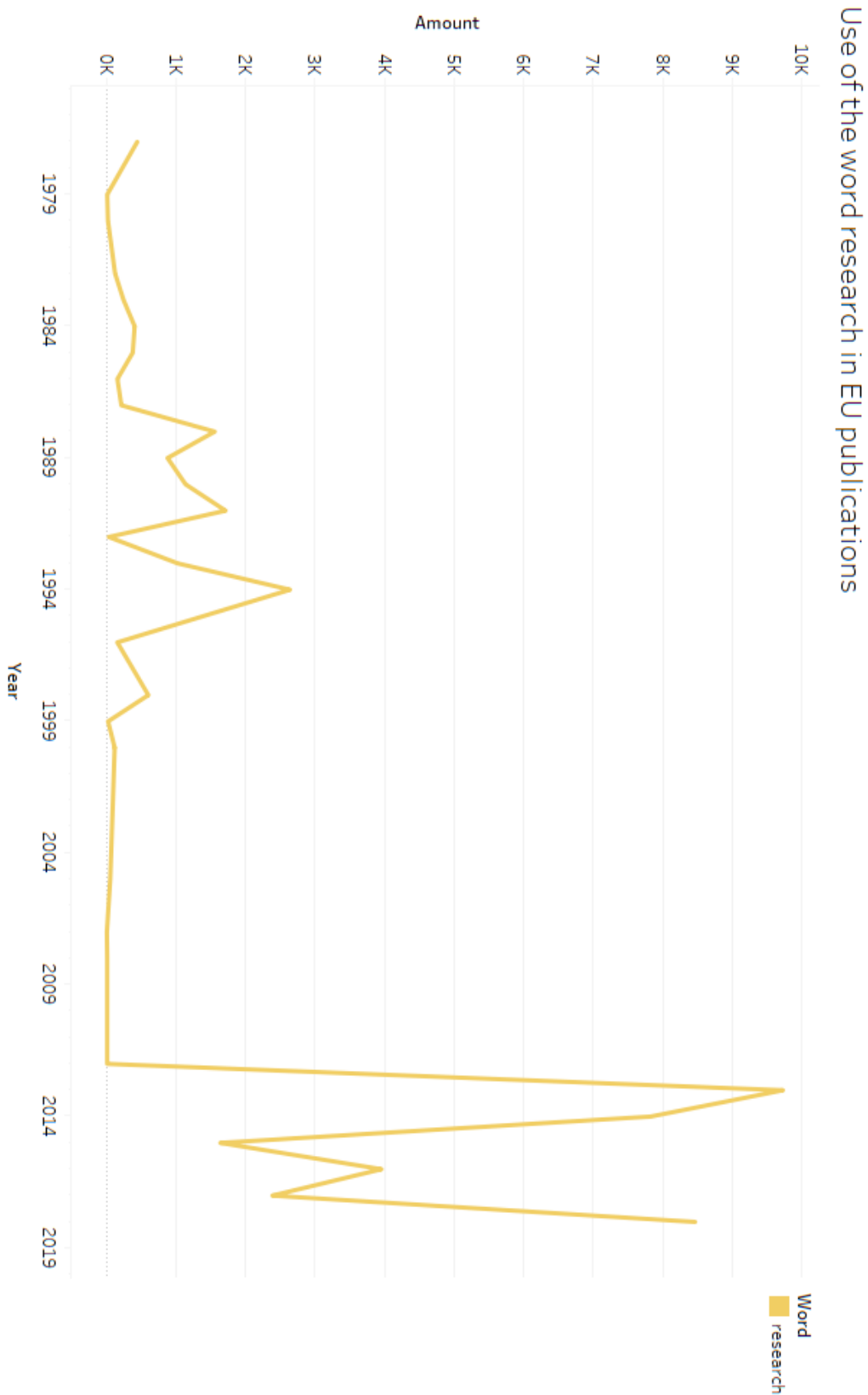
8.3 Appendix C



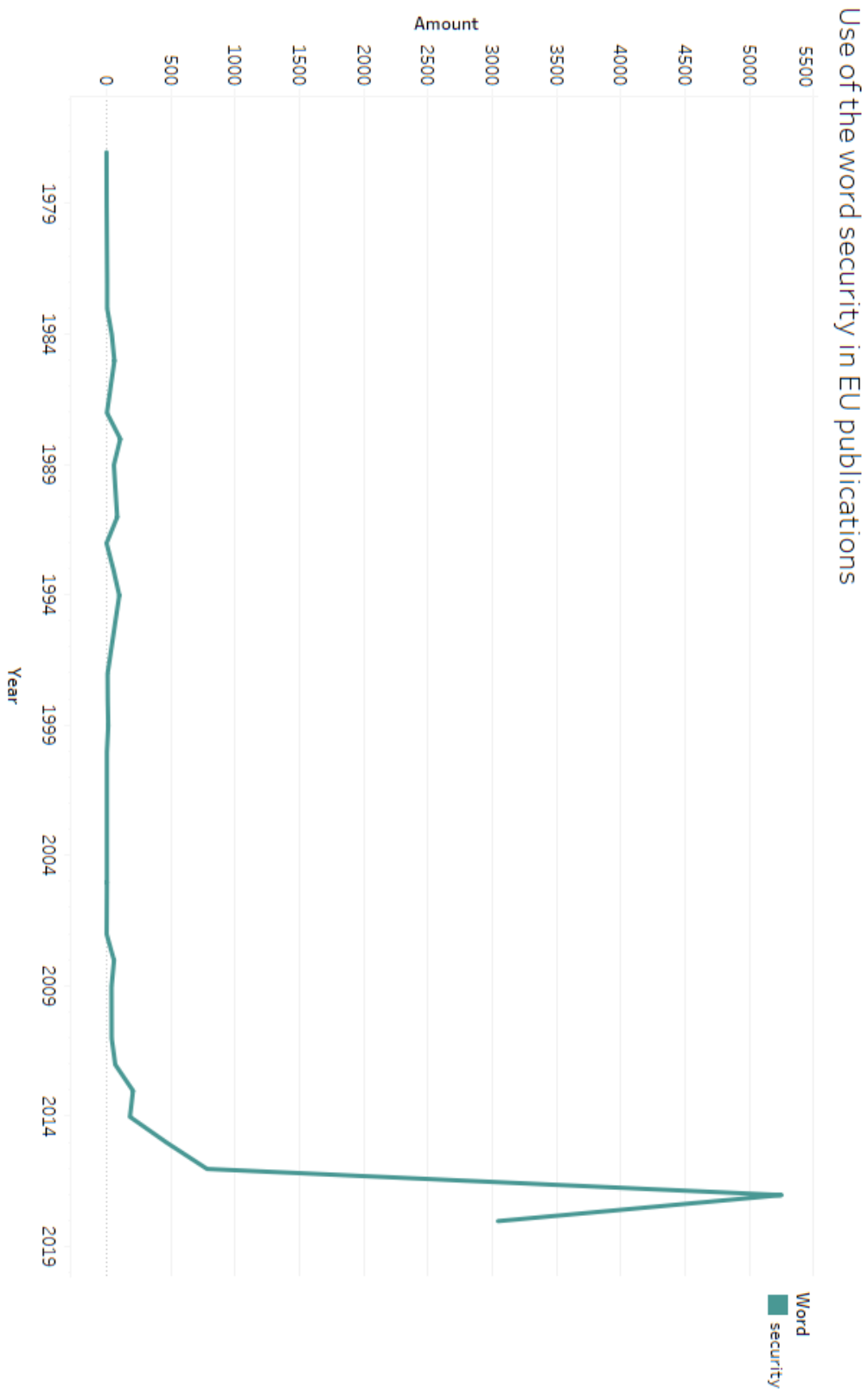
Appendix C1: Timeline of the word frequency within the corpus in absolute numbers. Made in Tableau.



Appendix C2: Timeline of comparison between the use of the words ‘development’ and ‘innovation’ within the corpus in absolute numbers. Made in Tableau.



Appendix C3: Timeline of the use of the word ‘research’ within the corpus in absolute numbers. Made in Tableau.



Appendix C4: Timeline of the use of the word 'security' within the corpus in absolute numbers. Made in Tableau.

Title	Form	Date
Community-COST Concertation Agreement on a concerted-action project in the field of artificial intelligence and pattern recognition (COST project 13)	International agreement	1985
85/519/EEC: Council Decision of 26 November 1985 concerning the conclusion of a Community-COST Concertation Agreement on a concerted-action project in the field of artificial intelligence and pattern recognition (COST project 13)	Decision	1985
Commission communication in the field of informatics Call for proposals for cooperative projects in basic research on teleinformatics, artificial intelligence and pattern recognition	Provisional data	1985
Opinion of the European Economic and Social Committee on Artificial intelligence The consequences of artificial intelligence on the (digital) single market, production, consumption, employment and society? (own-initiative opinion)	Own-initiative opinion	2017
COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Artificial Intelligence for Europe	Communication	2018
COMMISSION STAFF WORKING DOCUMENT Liability for emerging digital technologies Accompanying the document Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions Artificial intelligence for Europe	Staff working document	2018

Appendix C5: EU publications which specifically include ‘Artificial Intelligence’ in the title of the document. Notably, there are only 5 documents in the corpus that contain AI in the title, from which 3 are from 1985, 1 from 2017 and 2 from 2018.

Title	Form	Date
PROPOSAL FOR A COUNCIL DECISION INSTITUTING A SPECIFIC MULTIANNUAL PROGRAMME FOR THE RESEARCH AND DEVELOPMENT OF STATISTICAL EXPERT SYSTEMS (DOSES)	Proposal for a decision	1988
OPINION OF THE ECONOMIC AND SOCIAL COMMITTEE ON A PROPOSAL FOR A COUNCIL DECISION INSTITUTING A SPECIFIC MULTIANNUAL PROGRAMME FOR THE RESEARCH AND DEVELOPMENT OF STATISTICAL EXPERT SYSTEMS (DOSES)	Opinion	1988
AMENDED PROPOSAL FOR A COUNCIL DECISION INSTITUTING A SPECIFIC MULTIANNUAL PROGRAMME FOR THE RESEARCH AND DEVELOPMENT OF STATISTICAL EXPERT SYSTEMS (DOSES)	Proposal for a decision	1989
REEXAMINED PROPOSAL FOR A COUNCIL DECISION INSTITUTING A SPECIFIC MULTIANNUAL PROGRAMME FOR THE RESEARCH AND DEVELOPMENT OF STATISTICAL EXPERT SYSTEMS (DOSES)	Proposal for a decision	1989
89/415/EEC: Council Decision of 20 June 1989 instituting a specific programme for the research and development of statistical expert systems (Doses)	Decision	1989
Opinion of the European Economic and Social Committee on Artificial intelligence The consequences of artificial intelligence on the (digital) single market, production, consumption, employment and society? (own-initiative opinion)	Own-initiative opinion	2017
COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Artificial Intelligence for Europe	Communication	2018
COMMISSION STAFF WORKING DOCUMENT Liability for emerging digital technologies Accompanying the document Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions Artificial intelligence for Europe	Staff working document	2018
Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Digital Europe programme for the period 2021-2027	Proposal for a regulation	2018
Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Digital Europe programme for the period 2021-2027 Annex	Proposal for a regulation	2018

<p>COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027</p>	<p>Impact assessment</p>	<p>2018</p>
<p>COMMISSION STAFF WORKING DOCUMENT EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme</p>	<p>Summary of impact assessment</p>	<p>2018</p>

Appendix C6: EU publications which specifically include ‘Artificial Intelligence’ in EUROVOC indicator, retrieved from the metadata dataset. Only 12 documents are categorised in this indicator, however only 6 of them often mention AI. In the earlier documents from 1988 and 1989, expert systems were apparently how AI was referred to. Even though, these documents are presently categorised in EUROVOC within ‘artificial intelligence’.

8.4 Appendix D

Word frequency count (Filtered words) in European publications from 1977 to 1989 (1 of 3)

Word	Year										
	1977	1979	1980	1982	1983	1984	1985	1986	1987	1988	1989
access	5	12	1	20	31	73	81	7	28	65	25
action	64	29	19	3	41	73	79	34	84	511	231
activities	51	3	4	21	116	134	138	85	124	471	288
appropriation	1					2	2			3.666	1.749
appropriations	12				7	3	4	2	3	6.224	3.280
budget	25	3	3	5	22	14	21	5	8	1.056	427
commitments	3	1				1				2.752	1.409
communities	21	3	3	7	107	344	309	43	70	4.281	1.760
community	357	166	45	78	215	255	322	105	195	2.980	1.360
cooperation	19	5	3	21	27	64	59	10	56	630	433
costs	8	3	1	5	7	37	62	6	25	828	520
cover	2	2	1	9	6	46	42	6	6	2.190	1.186
data	25	65	11	72	116	312	359	53	155	266	136
decision	31	17	4	5	39	51	87	70	17	1.296	681
development	141	36	17	115	147	545	809	86	177	731	367
differentiated				1						3.048	1.529
digital		5		4	10	19	60	1	9	16	5
economic	43	19	9	15	32	54	101	22	44	658	443
era		1		1			1				
expenditure	22		4	3	10	6	19	3	7	2.490	1.356
financial	34	17	1	3	18	22	66	7	19	2.461	1.109
framework	14	13		18	24	58	72	26	57	123	93
fund	1	5			1	16	12			355	154
funding	2	1	1	1	1	8	21		2	29	14
general	27	10	3	21	42	140	143	26	24	1.225	481
impact	2	12		3	15	58	61	5	13	37	20
implementation	21	6	3	27	19	166	189	12	48	276	153
information	48	96	21	160	146	463	563	43	160	838	389
innovation	13	8	1	7	5	2	24	2	4	78	43
legal	5	6		1	1	17	4	2	4	92	41
management	8	5	7	44	48	254	276	26	41	883	246
market	6	79	2	28	28	44	124	13	29	560	233
measures	23	31		4	19	54	34	11	46	831	339
member	132	42	17	5	67	169	69	20	53	1.007	403
national	66	43	2	35	25	63	61	20	33	218	116
official	2	1	1		99	285	279	40	62	3.110	1.330
parliament	9	2	2		25	23	3	4	11	347	164
payments					3	1	6			2.537	1.300
policy	162	20	2	6	26	45	24	8	10	415	205
programme	83	22	23	133	339	378	407	97	113	1.175	612
programmes	73	14	4	33	61	64	114	28	43	452	234
project	46	11	6	95	57	425	948	19	16	159	93
projects	106	15	3	65	97	478	585	22	73	715	367
public	54	36	5	18	21	43	60	5	16	294	171
regulation	7	3	4	12	7	27	18	37	18	2.567	1.318
research	440	8	19	122	243	403	376	155	212	1.555	876
revenue	2			1	2	1	2			797	494
security	1	2		6	6	42	62		4	108	58
services	13	61	2	7	20	47	141	38	52	532	275
social	37	33	1	6	16	25	21	6	17	596	283
support	14	20	3	35	42	214	335	24	50	408	225
systems	14	25	10	202	117	823	1.108	55	177	277	105
work	24	8	19	67	153	445	704	48	138	418	225

Appendix D1.1: Word frequency count in the EU publications from 1977 to 1989. Displays words with a frequency of 10.000 or higher. Non-relevant words (such as verbs and linking words) are filtered out of this list.

Word frequency count (Filtered words) in European publications from 1990 to 2005 (2 of 3)

Word	Year										
	1990	1991	1992	1993	1994	1996	1997	1998	1999	2000	2005
access	27	55	2	168	301	7	5	56	10	4	
action	384	272	11	162	467	8	1	170	40	12	2
activities	361	657	1	501	1.498	30		253	6	7	3
appropriation	2.034	3		3	2			4			
appropriations	4.607	24	4	72	94	1		6			
budget	387	132	4	69	119	7		68	4	1	3
commitments	2.008	2		98	20			14	3		1
communities	2.050	373	58	82	220	16	44	47	66	9	1
community	1.641	690	69	809	1.993	29		275	70	16	1
cooperation	698	173	8	219	435	9		117	7	6	
costs	377	45	2	50	404	11		15	13		2
cover	1.393	67	1	50	136	2		12	3		
data	108	664	4	156	240	13	12	30	15		
decision	783	466	23	93	693	10	2	44	17	4	1
development	783	660	23	731	1.438	42	29	194	62	18	18
differentiated	1.947	1		1	17						
digital	13	16		101	107	1	56	9	37	1	
economic	527	214	7	336	725	16		120	19	7	8
era				3	5						
expenditure	1.654	89	3	71	178	13		5		3	
financial	1.157	141	6	126	516	6		30	3	9	3
framework	160	266	1	215	738	47		295	18	25	5
fund	165	8	1	50	63			7	1		3
funding	19	34	3	33	174	4		59		2	6
general	460	166	3	123	373	12	3	54	8	2	3
impact	34	107	5	200	410	11		65	7		4
implementation	195	231	7	293	473	6		81	21	4	1
information	662	449	4	388	725	34	8	134	19	6	3
innovation	149	29		54	107	12		147	2	8	
legal	62	43	7	25	171	3		9	8	3	1
management	214	419	4	367	518	13	2	120	54	2	5
market	380	97	4	178	672	22		44	19	6	3
measures	452	229	36	342	661			109	22	5	2
member	396	528	35	353	717	15		52	17	29	8
national	110	389	5	245	562	13		64	32	8	3
official	1.630	270	35	76	156	15	44	41	65	10	8
parliament	191	371	86	105	194	4		37	4	11	1
payments	1.820	5		45	31	1		10			
policy	282	119	12	147	464	14		73	17	9	
programme	771	1.054	6	677	3.081	39	1	644	34	26	24
programmes	367	443	4	358	479	20		235	6	17	20
project	47	316	2	262	549	16		111	1	1	3
projects	446	423	7	415	1.000	14		320	7	5	12
public	144	132	19	178	420	7		57	6	6	1
regulation	1.528	44	63	78	285		6	2	29		
research	1.136	1.711	31	1.024	2.638	154		600	21	116	52
revenue	468	2		4	39	1		4			
security	71	84	1	54	100		9	10	14	4	4
services	236	209	6	490	704	24	1	58	45		1
social	368	136	3	208	416	11		61		4	8
support	611	494	4	310	615	14	4	139	19	9	2
systems	154	410	11	662	870	17	208	83	215	5	6
work	430	752	6	395	1.093	17	1	100	17	4	2

Appendix D1.2: Word frequency count in the EU publications from 1990 to 2005. Displays words with a frequency of 10.000 or higher. Non-relevant words (such as verbs and linking words) are filtered out of this list.

Word frequency count (Filtered words) in European publications from 2007 to 2018 (3 of 3)

Word	Year										
	2007	2008	2009	2011	2012	2013	2014	2015	2016	2017	2018
access	1	16	105	7	13	1.617	1.033	296	650	1.452	5.108
action		12	14	12	16	1.304	285	1.028	1.143	1.832	3.211
activities	1	29	43	27	29	676	605	916	1.237	1.914	5.654
appropriation							1	1.968	2.036	2.060	6
appropriations						85	41	7.934	8.041	8.165	313
budget	8				9	408	886	1.390	1.513	1.723	3.442
commitments	1					217	118	3.509	3.612	3.738	492
communities	1	3	4	3	4	88	60	169	201	216	466
community	8	20	93	14	15	199	152	1.005	1.146	1.193	670
cooperation		7	5	5	9	763	668	1.010	1.445	2.914	3.888
costs	36	88	105	82	90	220	174	779	834	2.989	4.474
cover	1	6	2		3	36	25	1.883	1.955	2.155	908
data	1	46	250	25	28	420	905	491	1.043	8.434	11.259
decision	23	34	61	32	34	174	250	1.699	1.771	2.735	1.304
development	8	3	1		16	1.269	1.371	1.989	2.510	2.982	6.049
differentiated						2	1	1.904	1.920	1.942	63
digital	1	5	1	1	3	952	387	109	576	2.019	6.661
economic	3	20	4	3	23	206	249	1.057	1.357	2.399	3.495
era						5.399	4.448	18	217	53	330
expenditure	51	10	10	10	11	66	68	3.735	3.831	3.937	849
financial	4	2	2	2	12	409	297	4.980	5.510	6.845	8.103
framework	3	7	5	4	13	492	410	795	1.154	2.981	5.958
fund					5	469	252	1.606	1.781	1.955	3.588
funding		1			9	2.778	1.964	122	674	415	4.859
general	5	13	28	8	11	306	174	1.425	1.534	2.259	2.705
impact	5	2			3	149	136	214	815	2.104	6.093
implementation	1	9	8	7	11	659	570	765	999	1.625	4.988
information	7	105	97	87	100	1.191	575	1.288	1.427	4.699	4.333
innovation	4				2	2.279	1.273	838	1.467	1.470	9.151
legal	7	20	32	15	27	872	215	1.733	1.795	3.295	3.950
management		6	7	5	8	277	146	945	1.097	1.740	3.460
market	27	4	1	1	23	904	241	450	919	3.427	8.516
measures	1	27	26	24	26	597	499	737	845	1.914	2.752
member	15	452	418	423	455	1.107	1.493	1.344	1.304	6.129	10.783
national	9	20	20	15	36	4.788	2.643	390	1.014	2.420	6.915
official	17	64	53	9	24	317	652	2.375	2.486	2.820	446
parliament	2	22	20	6	10	96	186	2.064	2.245	3.008	2.390
payments		14	11	12	12	25	30	3.627	3.660	3.973	293
policy	1	3	3	1	15	995	606	1.446	1.937	3.440	7.598
programme		1			5	1.416	850	1.737	2.619	2.191	16.584
programmes	1	2	1	1	5	1.302	793	1.056	1.425	1.320	5.638
project	4	1				600	821	1.074	1.850	1.639	1.814
projects	2				5	989	514	660	1.830	1.080	3.929
public	4	5	42	5	12	2.330	1.088	597	1.016	3.234	8.763
regulation		441	568	382	399	551	639	5.245	5.149	7.366	7.470
research	3	8			8	9.730	7.827	1.636	3.954	2.385	8.467
revenue						5	11	3.215	3.594	3.673	383
security	2	59	40	41	69	207	183	472	783	5.252	3.046
services		24	15	15	18	702	663	913	1.332	4.050	5.820
social	5	67	44	42	59	429	286	1.197	1.484	2.107	5.055
support	6	2	7	1	10	1.124	970	1.477	1.959	2.773	10.991
systems	1	17	10	8	21	580	122	339	562	1.650	3.158
work	11	49	45	41	47	339	242	477	715	1.561	2.940

Appendix D1.3: Word frequency count in the EU publications from 2007 to 2018. Displays words with a frequency of 10.000 or higher. Non-relevant words (such as verbs and linking words) are filtered out of this list.

