STUDENT FORUM

Subnational AI policy: shaping AI in a multi-level governance system

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Abstract

The promises and risks of Artificial Intelligence permeate current policy statements and have attracted much attention by AI governance research. However, most analyses focus exclusively on AI policy on the national and international level, overlooking existing federal governance structures. This is surprising because AI is connected to many policy areas, where the competences are already distributed between the national and subnational level, such as research or economic policy. Addressing this gap, this paper argues that more attention should be dedicated to subnational efforts to shape AI and asks which themes are discussed in subnational AI policy documents with a case study of Germany's 16 states. Our qualitative analysis of 34 AI policy documents issued on the subnational level demonstrates that subnational efforts focus on knowledge transfer between research and industry actors, the commercialization of AI, different economic identities of the German states, and the incorporation of ethical principles. Because federal states play an active role in AI policy, analysing AI as a policy issue on different levels of government is necessary and will contribute to a better understanding of the developments and implementations of AI strategies in different national contexts.

Keywords Artificial intelligence · AI policy · Federalism · Governance · Qualitative analysis

1 Introduction

Discourses about Artificial Intelligence (AI) have raised concerns about risks but also potentials of implementing these technologies. Policy actors have both responded and contributed to the salience of the issue by initiating regulation and publishing policy documents on Artificial Intelligence. The focus of much of recent AI governance research situates and analyses AI strategies, white papers, ethics guidelines, and similar documents issued by national governments and international institutions (e.g., Jobin et al. 2019; Schiff et al. 2021), demonstrating the relevance of multi-level governance settings in AI policy on the international level and—as we will argue—on the subnational level.

Subnational institutions have also published documents on Artificial Intelligence. However, these have been mostly overlooked by research on AI governance. This is surprising because Artificial Intelligence is connected to many policy areas, such as economic or research policy, where the competences are already distributed between the national and the subnational level. Therefore, to better understand the current dynamics of AI governance, it is important to take into account the context of policy-making beyond national governments, and adopt the perspective of subnational AI policy. In particular, to decipher the approaches of subnational institutions in different German states toward AI policy, we pose the research question "Which themes are discussed in subnational AI policy documents?" Answers will contribute to better understanding the negotiation of AI in multi-level governance systems as well as the discourse about and around Artificial Intelligence in AI governance more broadly.

In this paper, we, therefore, focus on subnational efforts to shape Artificial Intelligence. We first give a brief overview of current and related work in AI governance research. We then discuss the theoretical and political context of federalism and digital policy via the example of Germany. Subsequently, we present results from our empirical analysis of subnational AI policy efforts by German states. Lastly, we discuss our results and relate them to the implications of

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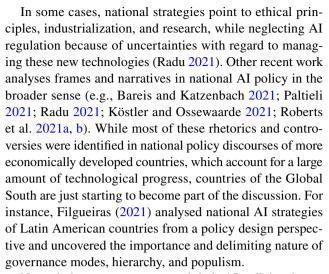
accounting for AI in federalist structures as an important dynamic in the governance of AI.

2 AI governance and policy research

Overall, AI governance is still an unorganised field that is inhabited by multiple, diverse stakeholders (Butcher and Beridze 2019). It comprises various modes, initiatives, and implementations (Schmitt 2021). On the policy level, three different sub-categories of policy types pertain to AI according to Brundage and Bryson (2016). For one, there are what they call direct AI policies, which are policies that have been issued specifically for AI-based technologies. Second, there are indirect AI policies, i.e., policies implemented for other technologies but indirectly affecting AI-based systems too. Lastly, the authors list what they call AI-relevant policies, by which they mean policies from 'other' domains that would benefit from knowledge about AI-based technologies (Brundage and Bryson 2016). These types of AI policies can be found in different kinds of policy documents, from existing regulation to high-level documents such as white papers or national AI strategies. The latter constitute a "powerful and peculiar hybrid of policy and discourse" (Bareis and Katzenbach 2021, p. 3) as they consolidate the issue of artificial intelligence on the political agenda.

Not only public sector actors are involved in AI governance, but companies and other private sector organisations also occupy an important role in AI governance. They are sometimes considered central to the point of being presented as better positioned for leading AI governance than governments (Dafoe 2018). Yet other stakeholder perspectives underline the importance of enrolling the public at large into AI governance by focusing on inclusion and participatory policy-making in AI governance or the lack thereof (e.g., McKelvey and Macdonald 2019).

The focus of this paper lies on policy documents issued by public sector actors on AI. The publication of such policy documents highlights the vital role of the state, notably in collaborations with research and the private sectors in the domains of AI developments and implementation (Ulnicane et al. 2020). As nation states "anticipate a significant impact on the global distribution of economic, military, and political power" (Fischer and Wenger 2021, p. 172), AI becomes a strategic issue that implies distinct intervention approaches by different countries. Often, strategic endeavours are framed and interpreted from a competitive perspective as "a new space race" (Ulnicane et al. 2021, p. 80). This can be clearly distinguished from a vision that centres on cooperative alliances between national governments (cf. also Smuha 2021, on competition vs. convergence of AI regulation), which occurs less in AI discourse.

In some cases, national strategies point to ethical principles, industrialization, and research, while neglecting AI regulation because of uncertainties with regard to managing these new technologies (Radu 2021). Other recent work analyses frames and narratives in national AI policy in the broader sense (e.g., Bareis and Katzenbach 2021; Paltieli 2021; Radu 2021; Köstler and Ossewaarde 2021; Roberts et al. 2021a, b). While most of these rhetorics and controversies were identified in national policy discourses of more economically developed countries, which account for a large amount of technological progress, countries of the Global South are just starting to become part of the discussion. For instance, Filgueiras (2021) analysed national AI strategies of Latin American countries from a policy design perspective and uncovered the importance and delimiting nature of governance modes, hierarchy, and populism.

Nevertheless, governments and their AI policies do not operate in a vacuum but within existing governance structures. Specific cases highlight notably the role of subnational structures, especially within countries that have instituted federal governments. For example in the US, it is federal states that have implemented particularly direct AI policies in the form of laws governing specific contingencies of self-driving vehicles (Brundage and Bryson 2016). Further legislative approaches primarily target algorithmic systems, including New York's 'algorithmic transparency bill' (for the city's use of algorithms), Florida's 'iBudget' system (personalised services for persons with disabilities), and Massachusetts' ban on the government's facial recognition usage (Lucero 2020). US cities, like San Francisco for instance, passed their own legislation too and are a key site of AI implementation, but are not often considered to be part of the AI discussion. A plausible reason for this could be their isolation from the global level (Schmitt 2021). Although being more isolated than the federal government, subnational governments can offer advantageous solutions to regulatory issues and problems related to implementation. Squitieri (2021) emphasises the benefit of states to implement, for instance, a 'wrong' regulatory regime first. On a national level, a supposedly destructive choice could lead to difficulties to reverse such decisions and could, therefore, entail downstream effects. Moreover, state governments have the capacity to adapt their standards and norms to localised circumstances (Squitieri 2021). In the same vein, cities and communities have been proposed as important vectors for innovating the governance of AI (Verhulst et al. 2021).

Germany's federal structure is a prime example to demonstrate how AI is entangled within existing political multi-level structures. For one, this is due to Germany's position in the European Union, but second, and central for this article, it is so because of the importance of the federal system within the German political system. The German two-tier system, characterised by a combination of shared rule and

regional self-rule influences the policy-making process (Gunlicks 2003). New policy fields, such as digitization, emerge within a particular existing institutional structure and are shaped by the interaction of actors, discourses, and their struggles within this political system (Haunss and Hofmann 2015; Pohle 2016; Pohle et al. 2016). The emergence of AI as a matter of policy is thus related to the German institutional setting, its actors and their competencies, which are distributed across ministries and state agencies on different governmental levels (Gunlicks 2003). In contrast to the national government, several German states (e.g., Bavaria and Hessen) have already implemented ministries for digitization on a subnational level (Deutscher Bundestag 2021), and many subnational institutions have also published policy documents on AI. Beyond the impact these documents may or may not have on the current research landscape, they provide a foundation for how AI is implemented and negotiated at a level 'closer' to the citizens. If the solution to better AI governance is, indeed, 'AI localism' (Verhulst et al. 2021), then the perspective of AI in multi-level governance, and especially in federalist settings, deserves more attention.

3 Subnational policy-making: German federalism and digital policy

3.1 Federalism and digital policies

Against this background, this paper introduces a federal perspective into the debate on AI policy. Federalism is an institutional design that divides the power between at least two distinct levels of government to guarantee a balance of power and more regional autonomy, with a high degree of multi-level decision-making and cooperative federalism. In the case of Germany, this is accompanied by the purpose of decentralisation where special emphasis is put on the protection of fundamental rights through a federal power division (Härtel 2017; Scholta et al. 2019). At the same time, the sharing of power between the federal and state level comes with some caveats, because the allocation of power and responsibilities over policy areas is not always clear. This can incentivize politicians to take credit or shift responsibilities for policy issues, however, it best suits their interests. The blend of areas of responsibility can make it harder for citizens to identify the responsible level of government for a certain issue and thus further motivate regional politicians to take credit for issues dealt with at the federal level (Gross and Krauss 2021).

Germany's subnational institutions influence the shaping of policies, as joint decision-making is an integral part of its institutional setup and competences are not always clearly distributed between the two levels of government. Germany is a particularly interesting example to study federalism

and its effect on policies because the 16 German states are deemed to have considerable leeway in policy-making. This applies especially to the domains where states have exclusive power, such as basic education, police, cultural policy, and media policies. The states are jointly responsible with the federal state for taxation, social and labour policies, as well as for executing the laws made at the federal level (Gross and Krauss 2021). Digitization, in particular, is an exceptional issue in policy-making on the subnational level because it has become a so-called cross-cutting issue that touches on many policy areas (e.g., research, education, economy or public infrastructure).

3.2 Digital policies in Germany

Federalism and the development of digital policies are closely intertwined, especially in the German case. Besides being a cross-cutting issue, the interconnection between federalist structures and the shaping of digital policies stems from the shared competences between the federal and state level, as well as by the fact that the states execute the laws made at the federal level. As argued by Gibbins (2000), digital techniques and federalism are indeed connected—however, it appears as federal institutions actively shape digital policies instead of being changed by digital inventions. Digitization is a relatively new policy field linked to several policy areas (Haunss and Hofmann 2015), which is why the shaping and creation of digital policies exacerbate German federalism's characteristics. While the link between digitization as a policy area and federalism as an institutional context has already been discussed (Gibbins 2000; Hösl 2015), this reference to concrete institutional structures is still missing in the discussion about AI governance.

It has previously been argued that Germany is a good example to study the variation of digital policies on the states' level because German states have considerable decision-making power—and, thus, the autonomy to draft 'independent' digital policies—while sharing the same institutional and cultural background (Siewert and König 2019). To understand how digital policies are created, it is necessary to capture the developments at the federal as well as state level because digital policy simultaneously involves both levels. As early as in the mid-1990s, the federal government and the states discussed which policy field internet policy should belong to, and consequently which level of government should be responsible. These discussions resulted in a division of competences between the federal government and the Länder as well as in a connection of digital policy to various established policy fields (Hösl 2015). States co-shape digitization policies, which is probably best illustrated by the fact that all German states have released digital strategies by 2017 and some have even created digital ministries. Interesting in this regard is also the role of political parties

at the states' level. Siewert and König (2019) found that parties address digitization most often in states where digital change has reached high levels but is neither saturated nor in its beginning.

Additionally, the establishment of digital policies does not only involve the relation between the federal level and the states' level, but also the coordination and competition between states themselves. The German multi-level governance system and cooperative federalism may induce elements of regional competition, especially on the interregional level (Benz 2007). Such a policy competition is not characterised by economic competition during which governments behave like market actors but rather by states' governments searching for approval for their decisions. This argument can be applied to states' behaviour during the drafting of digital policies, as they might use these policies to improve or maintain their socioeconomic standing relative to other states (Siewert and König 2019).

Because of joint decision-making, German federalism is sometimes seen as hindering innovation and digitization. Regarding the drafting and implementation of e-government policies, some scholars describe that the slow process to determine the responsible government level can lead to suboptimal decisions because, once a decision is reached, it might be based on the lowest common denominator principle due to the number of actors involved (Scholta et al. 2019). Others, however, argue that federalism as an institutional framework designed to balance powers and guarantee civil liberties has the potential to find the best regulations and approaches to deal with digital innovations while promoting these values (Härtel 2017). A related argument positions federalist structures as being able to produce more innovative projects and policies on the subnational level because local politicians may be exposed to less risk or aiming for a higher position, thereby challenging the status quo (Rose-Ackerman 1980). An analysis of digital strategies has shown that the states' digital strategies go beyond the implementation of the expectations set out in the federal government's Digital Agenda (Härtel 2017). As states' digital strategies are shaped by a mix of coordination, cooperation, competence, and competition between actors (Härtel 2017), their drafting procedure and content depends on factors such as party competition, traditional economic structures, financial strength, regional references as well as social conditions. Despite these differences, some convergence regarding objectives and impetus can be observed (Härtel 2017).

In short, the example of Germany's federal structures demonstrates that these modes of decision-making impact how digital policies are drafted. This applies to digital policies in particular because they touch many policy areas and, thus, many levels of government. Yet, how federal structures impact digital policies can vary, which is why we empirically analyse AI policy documents that exist at the states'

level, while paying special attention to the mixture of cooperation and competition as well as the emphasis on regional (economic) identities. Therefore, this paper aims to understand how the subnational level is indeed contributing to AI discourse, which is being mostly neglected by research up to this point. In the analysis, we lay our focus especially on thematic aspects that we found to be prevalent in previous studies on digitization and federalism. Moreover, we ask which competences can and should be divided between the subnational and federal governments and how this is translated in the examined documents.

4 Methods

We illustrate the usefulness of subnational AI policy, i.e., a change of perspective, through a mapping of German AI policy documents on the state level. Our empirical results reveal that all 16 federated states have indeed developed AI or digital strategies, as well as other policy documents referring to the advancement and governance of AI technologies.

4.1 Data collection and sample description

The AI policy documents were collected between March 2021 and September 2021. We define AI policy documents as documents addressing policy issues mentioning Artificial Intelligence. As there is no generally agreed definition for Artificial Intelligence, we included each document that uses the term "Artificial intelligence" without applying a definition of our own to include or exclude specific technologies. To identify relevant documents, the search terms 'Künstliche Intelligenz' (Artificial Intelligence) and 'KI' (AI) were used on the regional governments' central websites. For each of the 16 German Länder (states), at least one document was included in the selection. For those Länder in which more than one document appeared, only documents in which either AI is mentioned several times, or in which a specific section is dedicated to AI, were included.

In total, we retrieved 34 AI policy documents on the subnational level (see Appendix A). Overall, the documents included in our dataset were published between 2016 and 2021. Almost every document was authored by the public sector, except for four documents which were (co-)authored by private sector actors and one document authored by a research actor. Within the public sector, state governments and state chancelleries are the main issuers.

For each state, we found at least one document covering AI, but the extent to which AI is covered varies considerably. For instance in Mecklenburg-Western Pomerania and Saarland, AI is not covered extensively. The Länder that published the most documents in our dataset are Baden-Württemberg, Hessen and North Rhine-Westfalia, with four

Table 1 Inductive categories and dimensions of qualitative content analysis

Categories	Dimensions
Sectors	Public administration
	Mobility
	Urban planning
	Agriculture
	Healthcare & medicine
	Education
	Police
	Finance
	Research
	Economy
	Infrastructure
	Environment & sustainability
	Labour
Locations	Cities
	Regions
	Europe
Policy instruments/principles	Responsibility of states
	Leadership claims
	Ethical principles
	Networks/cooperation
	Competition
	Citizen consultation & civil society
	Legislation
	Investment
	Certification
Rhetorics/narratives	Structural change
	Dystopia
	AI as success factor/instrument/key technology

AI-related documents in each state. This seems to indicate that states with low population size and less economic power tend to publish fewer documents.

While some states (e.g., Baden-Württemberg, Hessen, Thuringia) published digital strategies between 2016 and 2018, the keyword Artificial Intelligence was mentioned rarely. Only after the release of the national German AI strategy in October 2018, the first AI strategies were published at the Länder level. Baden-Württemberg was the first to publish their AI strategy, namely in early November 2018. Most states published their AI strategies in 2019 or 2020. Saxonia released its AI strategy in September 2021 and represents the most recent AI strategy in our dataset. Some states have not yet published strategies exclusively dedicated to AI.

The AI policy documents vary regarding their mode of drafting. In some states, an assessment or public recommendation by a private sector actor (e.g., a consultancy agency or a health insurance company) or a research actor preceded the AI strategy, as in Hessen, Berlin/Brandenburg, and Mecklenburg-Western Pomerania. Many strategies mention public–private partnerships in their strategies.

4.2 Data analysis

To identify and map recurring themes and their distinct negotiation in different German states we conducted a content analysis with the coding software MAXQDA. We treated our data sample, the subnational policy documents, as texts with the aim of discovering key issues and aspects of subnational AI policies, and tracing similarities, differences, and interrelations between the different German states, while simultaneously being aware of the context these documents were drafted and created in (Karppinen and Moe 2019). The analysis was conducted in German language and all following quotes from the documents that are included in the findings have been translated to English by one of the authors. We based our approach on qualitative content analysis (Mayring 2014; Puppis 2019) with the aim to identify the content of the policy documents by developing inductive categories. Through this coding approach, several categories were found in subnational AI documents. We developed categories using sentences and passages as units of analysis. When a whole document was about AI (i.e., 'AI' or 'Artificial Intelligence' in the document's title), we coded the entire document, whereas when documents solely included a passage on AI, we identified and coded only the related passage. Besides developing the categories close to the material, we coded for categories on different levels of abstraction (see Table 1). First, we were interested in sectors (e.g., economy, research, police) and locations (e.g., cities, communes) of AI implementation. Second, we focused on different characteristics of subnational efforts as such. Among them can be found the

Fig. 1 Overview of subnational AI policy documents' key concerns

I. Connecting Economy and Research as a Means to Success	II. Cooperation with Selected Entities	III. Ethical Principles and Citizen Consultation	IV. Areas of Application	V. Rhetorics and Narratives
Transfer of knowledge from research to industry sector	Some states raise **claim to leadership**	Values derive from German **national strategy** or **basic law**	Fields of application often match states' **regional economic identity**	Adoption of certain terms and rhetorics from **national AI policy documents**
Interchange formats: networks, hubs, platforms, etc.	**Competitiveness** especially between neighbouring states or other nation states	Knowledge about AI as a means to foster **acceptance** within citizens	Increase efficiency in **public administration** processes	Establishment of a **brand** for specific states (e.g., "AI made in state X")
Focus on **training of professionals**	Cooperative tendencies towards **EU or national level**	**Formats of citizen consultation**: "real labs", workshops, hackathons, online surveys, etc.	No clear allocation of responsibility for **legal framework**	**Citizen-centric** rhetorics
Impact on specific economically strong **cities or regions**				

emphasis of leadership claims, the responsibility that states inhibit, their emphasis on ethical principles in AI development and implementation, and cooperation initiatives. Third, our analysis considered rhetoric and narrative expressions stated in subnational policy documents. For instance, the description of AI as an instrument or as a key to success were part of these categories. This approach allowed for a comprehensive analysis of the issues discussed in the documents. In the following, we will, therefore, present overarching categories as well as specificities that could be found and exemplify distinct levels of subnational efforts.

5 Results: key areas of AI policy at the subnational level

The resulting analysis identifies five key areas in our data sample of subnational AI policy documents (see Fig. 1). These include the relevance and interconnection of economic and research endeavours for the successful development and implementation of AI, forms of cooperation fostered by the states, a focus on ethics in association with the incorporation of citizens, areas of AI application as well as rhetorical and narrative characteristics. We will present these findings in the following sections and discuss selected parts afterwards.

5.1 Connecting economy and research as a means to success

Research and scientific activities with regard to AI are the most recurrent themes in the data sample, which are closely followed by economy as another overarching topic. What these themes have in common, is their assessment as being the key sites of either AI development, implementation, or both. All states that published AI policy documents are concerned about connectivity, cooperation, and how to achieve a transfer of knowledge from one sector to the other. However, to do so, different states rely on different methods. For instance, so-called hubs, platforms, and interchange formats with a varying scope of application are introduced by several documents. Examples for exchange networks are the "KI.NRW" competence network in North Rhine-Westphalia that aims especially at knowledge transfer to medium-sized companies and professional qualifications [Nordrhein-Westfalen-Strategie-2019] as well as the network "BREMEN.AI" which attempts to connect research institutes and businesses with a focus on start-ups [Bremen-Senat-2017]. Cooperative formats are also proposed between subnational universities and non-university research institutions (e.g., KI-Allianz in Rhineland-Palatinate) and European universities [Baden-Württemberg-Land-2019].

That economy and research are intertwined within the states' policy documents is also emphasised through their focus on training professionals. Some states describe the increasing integration of AI in workplaces as a kind of structural change that needs to be addressed [e.g., Bremen-Senat-2017; Hessen-Ministerin-2021]. In this regard, professional training is based on higher education (i.e., degrees and courses such as data science and informatics), further training of employees, and consolidation of job applicants' skill sets. Overall, the expansion of education and training is presented as the key to successful AI implementation and economic flourishment. Furthermore, some states want to attract professionals internationally for AI development in their region: "We give important impetus to digitalisation in the areas of artificial intelligence, mobility, health and sustainability and attract the best talent from all over the world." [Baden-Württemberg-Strategie-2017, p. 31]. Interestingly, in this quote, AI as a technology is equated with sectors and objectives that require a need for digitisation.

Economic success is, moreover, a topic that is discussed as reflecting or having an impact on cities or regions as a whole. Some states focus their efforts on a certain city (normally their capital, as seen in Bavaria), while others name several promising cities that are often characterised by having universities with evolving 'AI' (in the widest sense) departments, big companies with R&D departments, or other research institutes. This may be because some states are uniting several economically strong cities in their territory (e.g., North Rhine-Westphalia). So-called communes[1] are only mentioned in the Hessian digital strategy which states:

> "Smart cities and regions need modern data management in accessible data spaces with suitable structures for the virtual (and, in the future, AI-supported) exchange and intersection of data—starting at the administrative level between different offices of a municipality, through the regional integration of urban and sector-specific data stocks, for example from mobility systems or industry to the supraregional networking of existing data platforms in Hessen." [Hessen-Ministerin-2021]

This quote exemplifies that Hessen aims at considering not only the technological development of AI in their territory but also the sectoral and regional integration and interrelation that AI implementation entails. The spatial and territorial distinction does, however, not solely focus on cities and municipalities. Some states want to increase the attractiveness of their entire territory for professionals [e.g., Schleswig–Holstein-Staat-2019].

5.2 Cooperation with selected entities

These findings are linked to the claim to leadership that some states raise [e.g., Sachsen-Strategie-2021; Nordrhein-Westfalen-Strategie-2019; Staatskanzlei Rheinland-Pfalz 2020; Hamburg-Strategie-2020], which illustrates the competitiveness between the individual states, especially between neighbouring ones (e.g., Bavaria and Baden-Württemberg). Bavaria's "Hightech Agenda" is a special case in this context because it draws a direct comparison to other states:

> "By comparison, according to our information, our strongest competitor, Baden-Württemberg, wants to create only 20 new chairs. And Schleswig-Holstein, which claims to 'play a leading role nationwide', is investing just 4.5 million euros. That's not even 1.5 % of our investments. And ultimately, the federal gov-

ernment wants to create 100 AI chairs. That means Bavaria is doing as much as the federal government as a whole. That's a real statement. Artificial Intelligence is not science fiction, but reality. AI is the steam engine of the new digital world and the basis for a fundamental technical and industrial revolution. Bavaria must not be left behind." [Bayern-Staat-2019, p. 6]

Although the clarity in this quote is an exception when compared to the other documents in our sample, it is meaningful in showing that the subnational and national level can both be comparative and cooperative dimensions for one state or the other. This might also be the case because some states want to benefit from the resources that were promised in the national AI strategy by complying with its goals or objectives [Schleswig–Holstein-Staat-2019]. Nevertheless, in some instances cooperation is found between a state (and their universities) and another state (e.g., between Schleswig–Holstein and Bremen and Hamburg).

Competitiveness can also be seen with regard to other nation states. Bavaria, for instance, draws a comparison between the current competition about professionals and, therefore, technological dominance and military arms race from the past. Here, special attention is given to China's investment goals compared to Germany's proposition [Bayern-Staat-2019, p. 4]. The US, too, is a frequently mentioned reference for comparison.

On other levels, like the EU, states claim cooperative tendencies. For example by dedicating their efforts of AI implementation to adhering to European values [e.g., Schleswig–Holstein-Staat-2019; Baden-Württemberg-Land-2019]. Or through cooperation with France, which is mostly forwarded by states spatially close to the French border [e.g., Baden-Württemberg-Land-2018]. In this instance, the minister-president of North Rhine-Westphalia mentions the Treaty of Aachen:

> "Especially in the field of artificial intelligence, Germany's most important partner is France. With the signing of the Treaty of Aachen on January 22, 2019, both countries decided to cooperate in this area as well, for example in networking the German AI competence centres and French AI institutes, inter alia through more exchange of research staff and the development of research cooperation." [Nordrhein-Westfalen-Minister-2018]

References to treaties or contracts with other countries are seldom featured in the subnational documents, representing the extraordinary connection between German states and France.

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[1] Communes (*Kommune* in German) are the lowest administrative unit in the German administrative system (e.g., municipalities).

5.3 Ethical principles and citizen consultation

Values are stated as being derived from the German national AI strategy and the basic law [Schleswig–Holstein-Staat-2019]. The Baden-Württemberg strategy even highlights ethical design (i.e., human-centric and focused on public good) as a distinguishing feature of German and European AI development [Baden-Württemberg-Land-2018]. More detailed statements are found in the strategy of Saxony that claims 'transparency' and 'non-discrimination' to be fundamental values [Sachsen-Strategie-2021]. The latter is particularly crucial for the use of AI in public administration [Hamburg-Verwaltung-2018]. In some instances ethical, legal, and social aspects that are tailored toward AI development and implementation are part of subnational strategies through support of research that is oriented towards these [e.g., Bremen-Strategie-2020; Hessen-Ministerin-2021]. Similarly, the digitization strategy of North Rhine-Westphalia highlights the role of research in humanities, social, and cultural sciences:

> "The current and future role of AI and robotics lead to research questions in humanities, social and cultural sciences, also with a view to IT security. Whether self-learning and autonomous systems will prove as useful, safe, and reliable providers for our society will be decisive for broad social acceptance and its added value." [Nordrhein-Westfalen-Strategie-2019, p. 47]

Generally, knowledge about AI technologies and what their implementation might entail is seen as the most important factor for acceptance in citizens. Either this is stated as being accomplished through research and knowledge transfer, as mentioned above, or through open formats that involve citizens. The Saxon AI strategy mentions that citizens need to be able to trust AI in relation to the citizen consultation process [Sachsen-Strategie-2021] and announces its goal that every citizen as a consumer needs to have some knowledge on AI. This and the fact that ethical principles are fundamentally based on the notion that the society is benefiting from their enforcement leads states to involve citizens in consultation processes. Such a format is the 'Bürgerdialog' in Hessen that aims at involving stakeholders from civil society and economy but also potential users of AI in so-called 'real labs', workshops, or hackathons [Hessen-Ministerin-2021]. Other states implement online surveys [Nordrhein-Westfalen-Online-2019] or conferences [Schleswig–Holstein-Staat-2019]. Schleswig–Holstein's project of implementing an "open data portal" does, moreover, rely on data donations from citizens [Schleswig–Holstein-Staat-2019].

5.4 Areas of application

Overall, specific fields of application are repeatedly pointed out in the subnational AI strategies. Often, these fields of application match the states' regional economic identity, with e.g., Baden-Württemberg mentioning its automobile manufacturers [Baden-Württemberg-Land-2018] and Hessen Frankfurt as a finance hub [Hessen-Strategie-2016]. This might show that states use their AI policy to promote their economic position relative to other states. Another often mentioned area of application that lies within the merit of the states is public administration, which should be using AI to increase efficiency (e.g., in Hessen and Hamburg). In this context, legal considerations and questions of legitimacy are part of the discussion and expert consultations in Hamburg [Hamburg-Verwaltung-2018]. Furthermore, the digital strategy of Hamburg references the findings of the Data Ethics Commission that emphasized the importance of high standards in AI development to prevent discrimination and secure legal certainty [Hamburg-Strategie-2020]. Other states, like North Rhine-Westphalia, see the responsibility for a legal basis in the hands of the federal government as their strategy states: "The tasks of the state are particularly to adapt or create the legal framework for digitization in many areas of life and to set a good example." [Nordrhein-Westfalen-Strategie-2019, p. 5]. The interaction between the federal government and the states in legal matters is on the one hand mediated by the states' representation in the *Bundesrat*. On the other hand, states are able to enact their own legislation[2]. Hence, whether this demand from North Rhine-Westphalia is reasonable or federal states are in theory also capable of adapting or creating legal frameworks for innovative technologies will be part of the discussion below.

In addition to this, education comprises an exceptional role in states' application of AI because it operates on different levels. While the Hessian strategy proposes "AI school labs" to introduce pupils to AI [Hessen-Strategie-2016], Baden-Württemberg wants to recruit more women for AI-related study courses [Baden-Württemberg-Land-2018]. On the contrary, North Rhine-Westphalia is developing educational software at universities [Nordrhein-Westfalen-Strategie-2019]. Furthermore, hospitals and the medical field as a whole as well as sustainability and climate change are other areas of application. For the latter point, the strategy of Schleswig–Holstein can be used as an example, which aims

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[2] The right to legislate is fundamentally the responsibility of the states (Article 70 of the basic law). However, the fact that technology/digitalization legislation touches many different areas of legislation, the German regulation of competing legislative powers complicates this right (Deutscher Bundestag, n.d.).

to promote intelligent electricity grids and mobility concepts [Schleswig–Holstein-Staat-2019].

5.5 Rhetorics and narratives

We found that several terms and rhetorics which were part of the national AI strategy and other national policy documents have also been adopted by subnational actors. For instance, the state government of Baden-Württemberg echoed the national strategy by formulating the goal of creating an 'ecosystem' for AI. In this context, they mention their so-called 'Cyber Valley' with several economically powerful companies such as Amazon, BMW, Bosch, or Daimler [Baden-Württemberg-Land-2018, p. 1]. This reference to Silicon Valley, as well as the strong focus on research and further development, exemplifies the competitive character of the strategy.

Furthermore, establishing a 'brand' for the specific states is a recurring theme within the subnational documents. "AI made in Bremen" [Bremen-Strategie-2020, p. 9], "AI made in Schleswig–Holstein" [Schleswig–Holstein-Staat-2019, p. 11], and "AI made in Hessen" [Hessen-Ministerin-2021] are prime examples of the way that these states try to claim a coherent trademark for their AI products. Similar expressions can be found in the German national AI strategy (Die Bundesregierung 2020) as it includes the phrases "AI made in Europe" (p. 7) as well as "AI made in Germany" (p. 11).

Narratively, some documents also give an assessment of whom they are targeting. The Hessian AI strategy states over several pages which citizens are affected by specific AI technologies on a regular basis. Among them are pupils, small business owners, nurses, and managing directors from all different backgrounds and cities within Hessen [Hessen-Ministerin-2021, p. 6–12]. This example shows the citizen-centric orientation of some of the strategies and is accentuated through the first goal of the Hessian strategy, namely to give citizens the chance to use their quality of life and opportunities for personal development through digitization [Hessen-Ministerin-2021].

6 Discussion

Our empirical analysis offers insight into the subnational landscape of AI policy documents, demonstrating that AI governance research benefits from including the perspective of AI at different governance levels. In sum, our analysis reveals that states are invested in shaping AI policies at the subnational level. They have adapted some topics of the German national strategy and linked the development of AI policies to their own regional economic identity, representing the fundamental diversity of Germany's federal states. On the subnational level, German states predominantly

focus on AI research and its transfer to economic actors as a means to realise the commercialisation of AI technologies and products. Besides the overall similarity of focusing on AI to begin with, what all states have in common is that AI is approached as a means to an end, namely economic deployment. The organisation of such initiatives is then often based on networked structures. Although states introduce several different terms, for instance, platform or hub, all of these point to the same strategic element of knowledge transfer from research to industry actors. This exchange of competences also includes the training and further education of professionals.
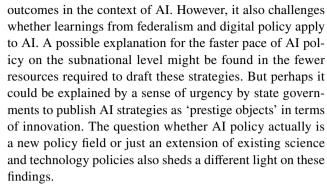
Competitive and cooperative characteristics are another important finding that our data set revealed to be present on the subnational level with regard to AI development and implementation. As shown in previous studies on digital policies, states might use these strategically to improve or maintain their socioeconomic standing in contrast to other states (Siewert and König 2019). In our findings, however, we did not only find competitive tendencies with regard to economic power or the attraction of professionals between states, but also the comparison with other nations and the federal level (as seen in the case of Bavaria). On the contrary, cooperative intentions could be identified between specific states (e.g., Baden-Württemberg, North Rhine-Westphalia) and France as well as between spatially close states. Other cooperative, or rather compliant, tendencies were apparent in references to and the acceptance of national and European values and strategic plans. A reason for this competition with other states while at the same time agreeing to the higher levels of the German multi-level governance system could lie in the promise of the EU and the federal government to allocate funds for AI implementation. Moreover, our dataset contains several digital strategies that have been previously analysed by Härtel (2017), because they specifically mention Artificial Intelligence. Perhaps unsurprisingly, we find that Härtel's argument on the merit of studying coordination, cooperation, competence, and competition in relation to the drafting and content of such policy documents also applies to our corpus. Especially relevant in the realm of AI policy documents seems the author's point regarding the need to analyse the mode of governance in light of the actors' mode of interaction.

Another reason for states to develop AI policy documents is the fact that, because of the different levels of responsibility in federal systems, voters might hold regional politicians accountable for federal policies (Gross and Krauss 2021). This might motivate regional politicians to signal to voters that they care about the new policy issue AI and develop their own documents. However, as we argued above, the responsibilities for policies are not always clear in the German multi-level governance system. This is not only true for strategic policies and discourses that are stirred by the

states but also for regulatory projects. From the analysed subnational policy documents we can dissect that states solely focus on their executive and strategic role when it comes to AI application. Although ethical-legal considerations are part of the documents, the implementation of those is rather associated with the federal level [Nordrhein-Westfalen-Strategie-2019]. This is also supported by the fact that the basic law is repeatedly referred to as a benchmark [e.g., Schleswig–Holstein-Staat-2019]. Hesitancy to regulate new technologies is no new phenomenon, however, in other countries and contexts the implementation of 'wrong' regulatory regimes on a lower level in multi-level systems is seen as beneficial (Squitieri 2021) and ultimately leading to innovative AI governance structures (Verhulst et al. 2021). In Germany, the application of these theories and examples of US cities or states that implemented AI regulation on the 'local level' reveal more complex structures than expected. Because the German federal states are not only entangled with the national level but also within the structures of the European Union, the distribution of competences is complex and cannot be resolved in the scope of this article. Nevertheless, we want to explain which factors have to be considered if one wants to approach this topic. For one, German federal states do have legislative competence in some sectors like education, for example. At the same time, the federal government holds legislative power in several other sectors that might be part of AI implementation (e.g., labour law) and national law generally overrides and sets the overall framework for subnational law. Yet these considerations take place within the structures of EU law which impacts all national and subnational processes and initiatives. This can be illustrated by examples such as the GDPR or the Digital Services Act. With that being said, we contend that theoretical considerations that originated from the US context or within structures that show other or even no federalist configuration at all are not applicable to German federalism unconditionally. Therefore, the distinction that we offer through the empirical examination of this issue is certainly reasonable and demonstrates the complicated nature and coordination of strategic, discursive, and legislative projects in multi-level governance systems.

Likewise, because AI is often seen as a new technique requiring new policies (Djeffal 2020), it is interesting to compare the development of AI policy documents at the subnational level with the emergence of other documents addressing digital innovations. Scholta et al. (2019) showed that e-government policies were developed very slowly on the subnational level, as the complex federal structures hindered quick progress because of the difficulty to assign areas of responsibility. However, we found the opposite regarding AI strategies: German states were very quick to publish AI strategies after the release of the national strategy. This shows that federalism is capable of producing quick

outcomes in the context of AI. However, it also challenges whether learnings from federalism and digital policy apply to AI. A possible explanation for the faster pace of AI policy on the subnational level might be found in the fewer resources required to draft these strategies. But perhaps it could be explained by a sense of urgency by state governments to publish AI strategies as 'prestige objects' in terms of innovation. The question whether AI policy actually is a new policy field or just an extension of existing science and technology policies also sheds a different light on these findings.

Another important finding from our empirical examination of subnational AI policy documents is the focus on citizen-centric projects that are introduced to foster acceptance within the public sphere through knowledge transfer and transparency. Paltieli (2021) argued regarding national strategies that formats of citizen consultation go beyond building trust and reaching legitimacy, as they can be seen as cases of "collective envisioning and imagining" (p. 6), which outline relationships between the mutual expectations of citizens and governments. This might also apply to the proximity of the states' level to citizens.

Based on these results we argue that AI research would benefit from a stronger focus on the subnational level. Aside from Germany, many other countries are organised in similar federal structures, which could also make them suitable as objects of research and comparison. Such a focus on the subnational level echoes the explicit call by the OECD for cooperation between different levels of government with regard to digital policy in general (de Mello and Ter-Minassian 2020). Therefore, it is evident that analysing AI as a policy field on different levels of government will contribute to a better understanding of AI governance more broadly.

7 Conclusion

This article has argued that research on AI policies misses an important space of policy-making and implementation if it does not investigate subnational institutions such as federal states. We have suggested a perspective on the subnational level to surface that multi-level governance in AI policies does not only move up from the nation state to supra- and international organisations, but is far more complex and concrete at the same time. Our case study on subnational AI policies in Germany finds that federal states sharing a cultural and institutional context, yet drafting different strategies partly competing with each other, offers interesting insights, and is an important site for the analysis of AI policy.

The results of our qualitative analysis of federal policy documents indicate that the relevance and interconnection of economic and research endeavours for the successful development and implementation of AI, forms of

cooperation fostered by the states, a focus on ethics in association with the incorporation of citizens, and specific areas of AI application are the characteristic of federal activities in AI policy. The mere fact that each German subnational state addresses AI as a policy issue in some way or another raises further questions. One such question would be whether the states that invest more resources—in the material sense or simply through drafting particularly ambitious strategies—and/or claim leadership positions share common characteristics. Another salient point might be to ask whether there are indeed specific incentives for states to engage in AI policy (e.g., funding by the federal government). Our analysis also invites further research on how much the publication of AI strategies may correlate with the level of digital change reached in a state, or can even be linked to the presence of a digital ministry.

As federalist structures are part of political systems all over the world and we were able to show which different characteristics those subnational policies can have, focusing on administrative levels that operate within nation states, and, therefore, closer to citizens and regional contexts, indicates that not only nation states are participating in the 'space race'. Whether these subnational policies indeed prove to be effective—or even more effective than national strategies—cannot be answered by this study. However, acknowledging that concepts like 'AI localism' (Verhulst et al. 2021), exist and impact the implementation of policy projects in multi-level systems, will be an aim for further projects that may compare AI implementation on the national level. Moreover, the coordination of states in relation to each other and to the national government in the process of drafting AI strategies deserves more attention. Future research could, for example, investigate narrative frames within subnational AI strategies in comparison to the national strategy.

In light of this, we have to highlight the unique qualities that each federalist system has and thereby limit the comparability of findings in German subnational AI policy documents to documents from states in other national contexts. The mode of decision-making, distribution of legislative power, and the possibility to even have competitive configurations between states are just examples of which factors can influence findings on the subnational level. Nevertheless, future research is needed that identifies the work of subnational policy actors in other countries. Which aspects are highlighted in AI policies in other multi-level systems? Is there a common or similar course of AI policy development within EU member states? And how would these systems compare to countries outside of the Union?

In sum, we want to encourage a closer look at the different ways of shaping and negotiating AI policy, which can be straightforward or very vague in their design. They reflect,

nonetheless, the different positions that executive bodies can occupy under the guise of a national identity and strategy.

Appendix A

Analysed subnational policy documents

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Data availability The data analysed for the current study are available from the sources included in the Appendix.

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