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Talking AI into Being: The Narratives and Imaginaries of National AI Strategies and Their Performative Politics

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Abstract

How to integrate artificial intelligence (AI) technologies in the functioning and structures of our society has become a concern of contemporary politics and public debates. In this paper, we investigate national AI strategies as a peculiar form of co-shaping this development, a hybrid of policy and discourse that offers imaginaries, allocates resources, and sets rules. Conceptually, the paper is informed by sociotechnical imaginaries, the sociology of expectations, myths, and the sublime. Empirically we analyze AI policy documents of four key players in the field, namely China, the United States, France, and Germany. The results show that the narrative construction of AI strategies is strikingly similar: they all establish AI as an inevitable and massively disrupting technological development by building

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on rhetorical devices such as a grand legacy and international competition. Having established this inevitable, yet uncertain, AI future, national leaders proclaim leadership intervention and articulate opportunities and distinct national pathways. While this narrative construction is quite uniform, the respective AI imaginaries are remarkably different, reflecting the vast cultural, political, and economic differences of the countries under study. As governments endow these imaginary pathways with massive resources and investments, they contribute to coproducing the installment of these futures and, thus, yield a performative lock-in function.

Keywords
artificial intelligence, sociotechnical imaginaries, governance, discourse analysis, international comparison

Introduction

> Technology is the answer . . . but what was the question?
>
> Cedric Price (1966)

Facing the current rush toward artificial intelligence (AI) by private tech companies such as Google, Facebook, Baidu, or Alibaba, and current public media attention for the subject, governments around the globe have proclaimed to partake in a global AI race (Dutton 2018). In recent years, national AI strategies and regulatory initiatives have been popping up all around the globe. As AI seems to penetrate all spheres of life, governments are on the spot as regulators, articulating potentials, risks, and ethical challenges that go along with current AI developments. Scholars and consultancies have compared and assessed national AI policy papers under the economic frame of "AI competitiveness" and "AI readiness" (Cambrian Futures 2019; Dutton 2018). But these documents do more than merely set rules: they constitute a powerful and peculiar hybrid of policy and discourse. They employ a prose of sober tech-policy, fierce national strategic positioning, and, at the same time, sketch bold visions of public goods and social order enabled through AI.

This paper portrays a comparative qualitative analysis of national AI strategy papers in order to unravel these visions and to deconstruct different

idealizations of statehood and algorithmic culture. Notwithstanding the apparent differences in the substantial content of national imaginaries, the key findings suggest a surprising consistency in the narrative of these strategies, converting bold and vague policy talk into a seemingly inevitable technological pathway.

The Integration of AI into Society in Public and Academic Discourse

Topically, this work is situated at the intersection of AI and society that investigates from different angles the coming into being of AI as a key sociotechnical institution of the twenty-first century. Long before the current hype, scholars in sociology and history of science have already studied multiple cycles of hypes and "AI winters" (Bostrom 2014) and extensively documented and analyzed the social construction of knowledge, scientific practices, and expertise in AI (Woolgar 1985; Courtial and Law 1989; Collins 1993; Suchman 2007). More recent work has stressed that machine learning is far from indifferent to human interaction (Bechmann and Bowker 2019; Castelle 2020), providing detailed ethnographies of technological cultures in AI research (Mackenzie 2017) and mapping the trajectories of competing subfields (Cardon, Cointet, and Mazières 2018). Particularly relevant for the present work, scholars have highlighted the constitutive role of metaphors, myths, and rhetoric: metaphors such as artificial "intelligence" or machine "learning" guide the societal discourse sustainably and fuel fantasies and future visions in the broader public just as much as in expert communities (Campolo and Crawford 2020; Natale and Ballatore 2017). Popular AI discourse also strongly rests on long-standing motifs of human-like machines in mythical storytelling and science fiction (Bory 2019; Cave and Dihal 2019).

In existing studies of media reporting and fictional representation of AI, scholars have identified coverage that primarily showcases the latest high-tech products and services. Here, business actors feature much more often in AI reporting than other stakeholders (Brennen, Howard, and Nielsen 2018; Chuan, Tsai, and Cho 2019; Fast and Horvitz 2017). This industry agenda-setting favors an overhyped vision of AI, resulting in a public focus on potentials of AI and neglecting its actual methodological limitations (Elish and boyd 2018). Recent studies of media coverage of AI in China reveal a similar dominance of the private sector in propagating positive discourses around AI but also stronger government propagation (Zeng, Chan, and Schäfer 2020).

Scholars have also started to track and analyze the recent uptake of regulatory initiatives on AI across the globe but particularly in Europe, Northern America, and Asia (Daly et al. 2019; Niklas and Dencik 2020). This literature analyses regulatory measures and investments, foregrounding ethics as a normative framework (Jobin, Ienca, and Vayena 2019). While this rise of ethical guidelines certainly constitutes a strategic move by the corporate sector to escape actual regulation (Wagner 2018), it also functions as a tool for governance, at least by shaping the very understanding of AI and its normative challenges (Larsson 2020).

In sum, the literature on AI's integration into society articulates a strong role for discourse in shaping the present and future sociotechnical pathways. Interestingly, scholars have not yet analyzed governmental positioning on AI and its role in future imaginary production. Certainly, governments are impacted by public and private narratives, but, in turn, they are themselves powerful players in shaping our perception and expectation of AI.

Conceptual Frame: Sociotechnical Imaginaries (SIs), Myths, and the Sublime

In this paper, we approach national AI policy and strategy papers as a peculiar hybrid of policy and discourse. They are at the same time tech policy, national strategic positioning, and an imaginary of public and private goods. In most cases, they sketch broad visions and ambitions but also allocate resources to AI research, list already issued policies and regulations, and present roadmaps for future measures and initiatives. Such a complex interplay asks for a conceptual frame that can do justice to this intricate relation of discourse, politics, and technology. For this reason, our research builds on existing concepts in science and technology studies, such as 'SIs,' but also strongly draws on political theory, sociology, anthropology, and communication and rhetoric studies.

In recent years, Science and Technology Studies (STS) has increasingly become interested in the conjunction of discourse and the making of politics and technology (Mager and Katzenbach 2021). Scholars study "expectations and stories about the future" (van Lente and Rip 1998; van Lente 2016), the role of technological innovations, and visionary rhetoric in enterprises (Beckert 2016) and highlight the discursive struggles around "contested futures" (Brown, Rappert, and Webster 2017). Authors have also investigated the role of futurist narratives and myths, particular regarding the internet and online activities (Flichy

2007; Mansell 2012; Mosco 2005). These "vanguard visions" (Hilgartner 2015) and the rhetorics of "pioneer communities" (Hepp 2020) are now receiving increasing attention in studies of the making of digital futures. With even more attention to language and words, scholars in linguistics, media, and communications have looked at metaphors (Lakoff and Johnson 1980) and their relation to technology (Wyatt 2017). In sum, these studies show that novel technology and science discoveries are regularly linked to modernist narratives of progress, especially in liberal capitalist and communist state systems that depend on technology as a means for market innovation and social engineering. In turn, looking at technology narratives serves as a means to look into desired futures, informing us about societal strivings and aspirations.

At the nexus of politics, discourse, and technology, the concept of *SIs* (Jasanoff and Kim 2009) has explicitly foregrounded the role of the state. The authors assert that sustaining imaginaries are always "associated with active exercises of state power, such as the selection of development priorities, the allocation of funds, the investment in material infrastructures" (Jasanoff and Kim 2009, 123). While subsequent research has shown that imaginaries are routinely rather multiple, contested, and commodified than uniform visions of the state (Mager and Katzenbach 2021; Jasanoff 2015), the role of the state remains crucial. It has the capacity to structure future expectations by combining powerful measures of issuing regulations and allocating resources with its own narratives and visions. State actors possess the (legitimate) means to sketch future societal pathways *and*, at the same time, craft influential institutions that define the virtues and vices facilitated by novel technologies and culture.

In the analysis, we substantiate this high-level concept with, firstly, Mosco's (2005) concept of *myths* as structuration devices for sociotechnical ordering. With Mosco, the power of myths (such as the apparently always imminent advent of "general AI") does not stem from their level of truthfulness: "myths are neither true nor false, but living or dead (. . .). To understand a myth involves more than proving it to be false. It means figuring out why the myth exists, why it is so important to people, what it means, and what it tells us about people's hopes and dreams" (p. 29). Hence, debunking myths as sole superstition and simple nonsense would disregard their proper social function. Instead, the deconstruction of successful myths brings to the forefront present desires and values as well the underlying power structures. Barthes (1972) pointed out that myths inhabit a concealing and escapist function, serving to bridge contradictions in society and to escape routine everyday life. Most importantly, this implies a

process of depoliticization: the narratives of successful myths massively reduce complexity and decouple developments from their social contexts and power structures. In consequence, myths push human and institutional agency to the background by imagining an unconstrained as-if world of possibilities. This rhetorical function, as the analysis will unravel, is very present in SIs of AI.

For reconstructing and explaining the awe that is often evoked by technological progress, Marx (2000) and Nye (2004) have coined the term *technological sublime*. The Romantics used the figure of the sublime to describe how natural phenomena and the riddles of physics evoke a feeling of overwhelming grandeur and astonishment. During the nineteenth century, with its early engineering masterpieces such as the railway, the sublime is increasingly "directed toward technology or, rather, the technological conquest of matter" (Marx 2000, 197). Evoking this technological sublime embodies the celebration of technological progress and conceals its problems and contradictions (Marx 2000, 207). As the upcoming analysis will show, this figure can be presently found in the historical framing of AI and help to understand how the agency can be shed away from humans and projected onto AI.

Lastly, we will refer to a greater body of literature regarding the sociology of expectations in order to explain the performative role of the articulation of hopes and fears projected on AI (Beckert 2016; van Lente 2016; van Lente and Rip 1998) in the policy texts at hand. When visions around novel S&T projects are announced, they are often embedded in a rhetoric of prospective potentials that innovation sets free. This rhetoric not only enduringly frames the perception of business and customers for a technology but also creates an element of performativity. "Expectations can be seen to be fundamentally 'generative', they guide activities, provide structure and legitimation, attract interest and foster investment" (Borup et al. 2006, 285–286). What begins as a bold promise, as we will see in the rhetoric analysis of the AI imaginaries, can quickly set free a notion of requirement and necessity—a powerful rhetorical motif urging figures to deliver on the promises. In concert, these conceptual frameworks will jointly function as sensitizing concepts for the following analysis that will focus on both the narratives (The Narratives of National AI Strategies: Talking AI into Being section) and the substantial imaginaries (The Imaginaries of National AI Strategies and Their Performative Politics section) articulated in national AI strategy papers.

Methods: Toward an In-depth Discourse Analysis of AI Tech-policy Strategies

In recent years, numerous countries around the world have been advancing national AI strategy papers. In this paper, we focus on the AI strategies of China, the United States, France, and Germany. This choice of countries is not exhaustive (Daly et al. 2019; Niklas and Dencik 2020), but it entails key players in the field. Their published AI strategies have received broad international attention, they feature industries and companies that are leading in AI tech development, and these countries share a geopolitical and economic positioning in the world that influences AI development far beyond their borders. The United States and China claim leadership in the global AI race; while France and Germany represent the most powerful nation-states and economies in the European Union with distinct approaches to AI deployment.

The strategy documents are special in various regards. Firstly, they are not set in stone but are subject to substantive updates, adjustments, or even radical dismissals and reorientations. Just as in other political fields, tech policy adapts to political situations and is largely affected by changes in government, for example, after the 2016 elections in the United States, where, ever since the Trump delegation took office, a substantially different stance on AI has been taken. Further, AI strategies are often not limited to one condensed official document or even one type of medium alone. Documents that receive the status of a strategy paper can entail summary reports of summit conference proceedings (2018 White House Summit on AI for American Industry [WHSum]; cf. Table 1), announcements of state councils (A Next Generation Artificial Intelligence Development Plan [NgDpl]), or reports by national expert groups (VilRp). These different media and forms of AI strategies already reflect distinct national political institutional cultures and complicate the identification of *one* single type of document as a reference. Pragmatically, in our analysis, we include any document that was officially labeled and published as an AI strategy document by a current government in charge between 2016 and 2020 in the four countries, needing to fulfill the minimum requirement to contain some policy measures on how to steer AI present and future (an exception is made with the United States which has experienced a very recent power shift with the Biden administration taking over in 2021). A list of the documents we collected and analyzed can be found in Table 1.

Methodologically, we place this work in the hermeneutical tradition of the study of technological imaginations (e.g., Verschraegen et al. 2017) and

Table 1. Overview of Documents Analyzed.

Country	Name of the Document	Date of Publication	Abbreviation
United States	2018 White House Summit on AI for American Industry	May 10, 2018	WHSum
	Summary of the 2018 Department of Defense Artificial Intelligence Strategy	February 12, 2019	DoDAIStr
	Summary of the 2018 National Defense Strategy	January 19, 2018	DoDNDStr
	Executive Order on Maintaining American Leadership in Artificial Intelligence	February 11, 2019	ExOAI
	National Artificial Intelligence Research Resource Task Force	June 10, 2021	AIRRTF
Germany	Nationale KI-Strategie	November 2018	StrKI
	Die Hightech- Strategie 2025	August 2018	HtchStr
	Comments from the Federal Government of the Federal Republic of Germany on the White Paper on Artificial Intelligence—A European Concept for Excellence and Trust	June 29, 2020	GerEUWP
France	The Villani Report	March 8, 2018	VilRp
	Speech Macron at the Collège de France (own translation)	March 20, 2018	SpMcr
	AI for Humanity web page	March 2018	AIfHwebp
China	A Next Generation Artificial Intelligence Development Plan	July 20, 2017	NgDpl
	Three-year Action Plan for Promoting Development of a New Generation Artificial Intelligence Industry (2018-2020)	December 14, 2017	3yApl
	White Paper on Artificial Intelligence Standardization	January 24, 2018	WpAI

vision assessment (e.g., Grin and Grunwald 2000), stemming from the technology assessment and the larger STS community (see an overview by Konrad et al. 2016). The content-based analysis of rhetorical motives represents an analytical explorative method, building on a rich pool of empirical examples that investigate the narratives, constellations, and process dynamics in the construction of contested futures (e.g., Lösch, Armin, and Meister 2019; Roßmann 2020). As a research design, we employ a cross-national comparison of countries (Jasanoff 2015, 24). Such a comparative approach not only discloses the formation of the articulated narratives and SIs but especially sheds light on the similarities, differences, and particularities found in each national articulation. We employ an interpretative discourse analysis that does not primarily focus on content (policy, funding, or regulation announcements, etc.) but instead focuses on the underlying argumentative meta-structure and the resulting imaginaries. To comprehend this construction process, we take into account rhetorical devices and narrative figures such as the technological sublime, myths, and the performative force of expectations as introduced before.

We display and analyze how policy documents merge a highly interpretative flexible technology cluster such as AI *and* a rather vague and contested discourse into a seemingly inevitable and sometimes even desirable technological pathway. For this aim, we initially undertook a close reading of all the policy documents listed above, independent of national origin, identifying core issues and themes in the depiction of the current national situation of AI present and future. Secondly, we clustered these themes, unraveling them as central rhetorical building blocks (the inevitability of AI, the necessity of AI, uncertainty, and leadership), which are present across all countries independent of the resulting national imaginaries. Thirdly, we investigated the relationship among these building blocks, understanding them as a coherent (but not necessarily linear) narrative that leads to the specific AI imaginary of each nation.

The Narratives of National AI Strategies: Talking AI into Being

In this section and the following, we will firstly portray the common narrative building blocks (Between Rupture and Legacy: The Inevitability of AI, International Competitiveness and the Interdependence of Technology and Societal Good: The Necessity of AI, and Uncertainty and Leadership: Articulating Hopes and Fears of Technological Advancement subsections) resulting from our analysis. Thereafter, we briefly sketch the different

national imaginaries as projections of political culture and social order enabled through AI (AI for Humanity and a Cybernetic Control System: Different Imaginaries subsection) and their performative effect resulting in potential lock-in pathways (Lock-in, Path-dependency, and Performative Politics subsection; cf. Figure 1).

Between Rupture and Legacy: The Inevitability of AI

As a first step of the narrative construction of the AI imaginary, multiple themes can be detected in the strategy papers that convert AI into *an inevitable technological pathway.*

To set the stage, political leaders situate their societies in a historical context in relation to AI technology. Either such historical context is portrayed as a seemingly unprecedented *rupture* that transcends any former societal experience or as a rupture that stands in a legacy of past historical transformations. Both historical motives turn current technological AI development into an autonomous agent, a determinist force that breaks over our societies. For example, the Chinese document comments: "The rapid development of artificial intelligence (AI) will profoundly change human society and life and change the world" (NgDpl, 2). Further, AI is portrayed as marking a turning point in world history with US president Trump proclaiming: "We're on the verge of new technological revolutions that could improve virtually every aspect of our live, create vast new wealth for American workers and families, and open up bold, new frontiers in science, medicine, and communication" (WHSum, quote Trump, 5). Here, AI is depicted as a breakthrough, a revolution, almost a sublime force that lets society enter a new epoch in history. Current transformation is celebrated as a rupture that knows no precedent. In such a context of invoked technological hype, "disjunctive aspects of technological change are often emphasized and continuities with the past are erased from promissory memory" (Borup et al. 2006, 290). Through negating historical continuities, the strategy documents are able to create a myth of a radical break. They suggest a momentum and Zeitgeist of exception, evoking the perception that current transformations will seemingly make everything different, an unforeseen revolution that penetrates every pore of society and makes past reassurances shaky and obsolete. Such denial of history provokes the use of metaphors and images of grandeur that need to underline the current state of exception. Brown et al. (2017) comment in this context: "when the future can no longer be expected to follow on neatly from the past, then imaginative means must be employed" (p. 8). Obscuring past pathways in

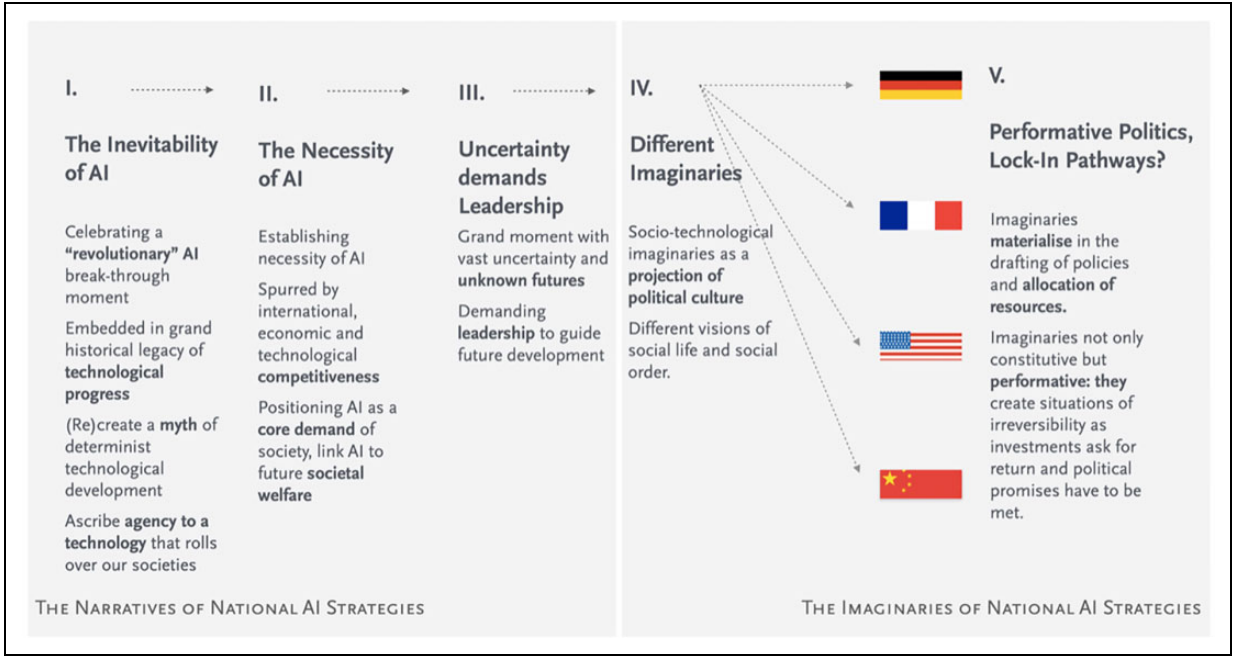

Figure 1. The narratives and imaginaries of national artificial intelligence strategies.

technological development necessarily purifies (excessively glorifies) and simplifies (reduces or denies social complexity) technological reality. Here, Mosco (2005) stresses: "The denial of history is central to understanding myth as depoliticized speech because to deny history is to remove from discussion active human agency, the constraints of social structure, and the real world of politics" (p. 35).

Legacy of historical transformations. But the rhetoric of a transcendence of history alone cannot evoke a "breakthrough" perception of AI technology. Analogies and referral to a grand historical legacy equally function to celebrate an upcoming revolution that disrupts humanity. In such a manner, US Deputy Assistant for technological development Kratsios envisions: "Generation after generation, American innovation has benefited our people and the entire world. American oil fueled world industries. American medicine conquered diseases. [. . .] Today, with so many of the mysteries of quantum computing, autonomous systems, and machine learning yet to be discovered, we can take hold of the future and make it our own" (WHSum, 11). And in a similar tone, the Chinese paper states: "AI has become the core driving force for a new round of industrial transformation, [which] will advance the release of the huge energy stored from the previous scientific and technological revolution and industrial transformation, and create a new powerful engine, reconstructing production, distribution, exchange, consumption, and so on (NgDpl, 2 f.).

Here, AI is situated in the linear and coherent promise of historical progress, building upon a legacy of a glorious past. In this context, Jasanoff (2015) comments "technological systems serve on this view a doubly deictic function, pointing back at past cultural achievements and ahead to promising and attainable futures, or to futures to be shunned and avoided" (p. 22). Connecting technological innovations with rhetoric of past revolutions is a strategic move to foster technological celebration, the technological sublime (Marx 2000; Nye 1996). The case of AI sublimation involves hyperbolic statements of technological success, alignment with a national memory of past achievements and a rhetoric of progress that includes the domination over nature or competitors, as well as the conquest over the impossible: "Reference to history and culture can also take the form of analogies to technological success in other fields, which is seen as proof that developments believed to be impossible can actually be realized" (Beckert 2016, 181). At the same time, such accentuation of a historical legacy suggests a notion of human passivity and impotence as we stand still

in awe to contemplate the pathway of a "natural" and "meant to be" historical technological progress that sweeps over our societies.

Such narratives lend agency to technology that transcends human control, confronting society with a seemingly all-pervasive and inevitable development (Brown et al. 2016; Winner 1978) while obscuring the contingencies and power relations of human interaction in the social, political, and economic realm on which any technological development depends. Once an agency is attributed to a technology, and political officials, economic players, and media coverage adapt such discourse, human agency is suddenly reduced to adaption, reaction, or mitigation: "the force implied in this attribution of agency is that one can either ride the wave of advancement or drown in the waves of progress!" (Brown, Rappert, and Webster 2016, 9). French president Macron employs this motive powerfully by stating: "This revolution will not happen in 50 or 60 years, it is happening today, it is really on its track, (. . .) we have to choose, we have to make certain decisions, given the fact that the technical and the social side is radical and the economic as well" (Speech Macron at the Collège de France [SpMcr]). Nye (2004) highlights that "the most successful of these little narratives are those that present an innovation as not just desirable, but inevitable" (p. 160). Hence, the myth of an inevitable pathway toward AI is created through a play with history that glorifies a seemingly present technological rupture or points at a continuation of a grand legacy, while at the same time negating the role of human agency in such technological development.

International Competitiveness and the Interdependence of Technology and Societal Good: The Necessity of AI

The notion of inevitability is fostered not only through the motive of technological determinism, but equally through the pressure of international competitiveness, harnessed within a discourse of capitalist and geopolitical striving for strategic advantage. In the rhetorical construction of an inevitable technological pathway, political leaders establish an interdependent connection between technology advancement, economic performance, and the resilience capabilities of a society. This creates a powerful rhetorical triangle that sheds pivotal attention and necessity to AI, lifting it into a sublime aura of a savior. The Chinese NgDpl proclaims: "AI has become a new focus of international competition. AI is a strategic technology that will lead in the future; the world's major developed countries are taking the development of AI as a major strategy to enhance national competitiveness

and protect national security" (p. 2). Facing such fierce international competition, the United States and France emphasize their current strategic position in the market. The French Villani report stresses that "It is vital to take advantage of our economy's comparative advantages and its areas of excellence in order to bolster the French and European artificial intelligence ecosystem" (VilRp, 9). The United States, defending its role as a worldwide leader, makes clear: "America has been the global leader in AI, and the Trump Administration will ensure our great Nation remains the global leader in AI" (WHSum, 8). And further: "Failure to adopt AI will result in legacy systems irrelevant to the defense of our people, eroding cohesion among allies and partners, reduced access to markets that will contribute to a decline in our prosperity and standard of living, and growing challenges to societies that have been built upon individual freedoms" (DoDAIStr, 5). The recent Biden administration, which took over power only this year, continues this narrative by stating: "America's economic prosperity hinges on foundational investments in our technological leadership" (National Artificial Intelligence Research Resource Task Force [AIRRTF]).

Last but not least, German Hightech strategy paper alerts in a tone of prey and predator: "Even more than in all previous transformations, in this phase of digitalisation the fast beat the slow. The winners will be those who open up new markets early and quickly set their own standards" (Hightechstr, 8 f.).

No matter if packed in a rhetoric of "catching up," "defending the pole position," or scenarios of "brute survival," capitalist competition about market shares and military strivings for geopolitical hegemony fostered through advancement in AI technology are portrayed as of pivotal importance. When such advancement is linked to societal resilience as a whole, technology becomes the crucial tool to master societal challenges or even acts as a yardstick to indicate present status of civilization. Now, technology receives the status of a sublime redeemer that has to be fostered and harnessed. If successful, such a positioning of technology results in an "an aura of indelible pragmatic necessity," as Winner (1978) notes, and "to ignore these demands, or to leave them insufficiently fulfilled, is to attack the very foundations on which modern social order rests" (p. 259). Consequently, these narratives elevate AI to become a core demand of society in its entirety, an essential societal good nobody can be deprived of.

Technological advancement acts as an essential pillar of civilizing progress in modern capitalist societies. If a "breakthrough" technology such as AI is detected, while at the same time nations locate themselves in an arena of fierce international competition, politicians magnify the potential of AI

to leapfrog economic growth in order to defend (or attain) the nation's global position. Once more, just as with the motive of technological determinism, the advancement of AI now seems vital as the resilience of an entire society depends on it. If the economy, security, and, accordingly, societal order as a whole are at stake, so the narrative suggests, only advancement in AI technology can assure that the current level of living can be maintained and future prosperity secured.

Uncertainty and Leadership: Articulating Hopes and Fears of Technological Advancement

Standing at the verge of such a dramatic historical moment, the consequences are hard to foresee. In the next building block of the construction of AI narratives, national leaders detect prospective potentials, opportunities, challenges, and risks that go along the "inevitable" pathway toward AI and establish a need for leadership.

For China, AI contains the promise of a remedy, projecting hopes of a "technological fix" to social problems: "AI brings new opportunities for social construction. China is currently in the decisive stage of comprehensively constructing a moderately prosperous society. The challenges of population aging, environmental constraints, etc. remain serious" (NgDpl, 3). In consequence, the Chinese government purports the need for strong leadership: "We must strengthen organizational leadership, complete mechanisms, take aim at objectives, keep tasks closely in view, realistically grasp implementation with a spirit of hammering nails, and carry out the blueprint to the end" (NgDpl, 27). Similarly, in the United States, Kratsios sketches a glorious possible future: "Artificial intelligence holds the promise of great benefits for American workers, with the potential to improve safety, increase productivity, and create new industries we can't yet imagine" (WHSum, Speech Kratsios, 9). Here, leadership is more distributed: "To realize the full potential of AI for the American people, it will require the combined efforts of industry, academia, and government. That is why we are all here today" (WHSum, Speech Kratsios, 8). The German strategy aims to turn the challenges of the transformative rupture of AI into fruitful potentials: "the challenges faced by Germany, as in other countries, involve shaping the structural changes driven by digitalisation and taking place in business, the labour market and society and leveraging the potential which rests in AI technologies" (kiStr, 10). The French strategy stresses the ambivalent character of this AI revolution. President Macron positions himself ready for delivering on these challenges: "(A)s you have

understood, you can count on me—I say it here without any innocence—to build the true renaissance that Europe needs" (SpMcr).

While the first two rhetorical themes have downplayed human agency, this third motif brings a new spin to the shared narrative. All strategy papers suggest that future trajectories are undetermined, voicing lofty articulations of hopes and fears rather than clear-cut answers of what the future of AI will bring. This nebulosity serves as a rhetoric that prompts national leaders back into the arena of action. van Lente (2016) highlights that such "statements about future technological performance [. . .] [serve to] mobilize attention, guide efforts and legitimate actions" (p. 46). Upon closer inspection, this spin toward leadership and human agency constitutes a somewhat inconsistent departure from the previous narrative elements of technological determinism and inevitability. If one depicts technological progress as a determinist and historical force by employing vocabulary that suggest human paralysis such as "overwhelming revolution" or "sudden breakthrough," it is hard to see where there is leeway for decision makers' agency to shape current and future transformations. Rhetorically, though, the articulation of expectations, hopes, and fears provokes a mobilizing momentum. It serves to open a window of incertitude, which invites for clarification and enables leadership intervention. It offers a suitable opportunity for national leaders to demand initiative and uncritical commitment to coproduce the very futures they envision. Here, "expectations are wishful enactments of a desired future. By performing such futures, they are made real and in this sense expectations can be understood as performative" (Borup et al. 2006, 286).

No matter if a sketched vision or a proclaimed expectation will ever be achieved, it powerfully shapes the discourse. If such political framing is negative, emphasizing the risks and fears that go along the "unstoppable" technological train of progress, then national leaders are put into an intervening role as saviors who can responsibly interfere or at least mitigate worst-case scenarios. Through such rhetoric, also rather less favorable decisions are easy to justify, as confronted with a bleak doomsday scenario (e.g., AI eradicating billions of jobs, AI technology provoking an international arms race), stakeholders are rather willing to bite the bullet. Likewise, though, the myth of a shiny AI future (e.g., the great vision of unprecedented economic growth, the automation of all tedious labor through AI) is a handy means to trigger an uncontested rushing toward a simplified and innocent golden future, often setting aside the social, political, and economic complexities, contradictions, and pitfalls that go along the new innovation.

In sum, AI's political rhetoric about hopes and fears is far from being informative alone. First and foremost, it is *constitutive* as it frames discourses and (im)possibilities; it is *enabling* as it allows political activity (also in the face of a looming threat); it can be *disguising* as it leaves unpleasant societal side-effects and questions about power structures unmentioned and finally also *(de)legitimizing*, bestowing legitimacy upon political leaders or social institutions—or authorizing certain standpoints or disapproving or condemning others (e.g., cherish technological progress against a "cynical cultural pessimism" or "reactionary Luddism").

The Imaginaries of National AI Strategies and Their Performative Politics

As we have shown, the narrative construction of the national AI strategies are strikingly similar. Yet, their substantial imaginaries are remarkably different, which is probably not surprising given the vast cultural, political, and economic differences of the countries under study. States offer future pathways and at the same time endow these visions with massive resources and investments. As a result, these imaginaries not only reflect on and offer sociotechnical trajectories but, at the same time, coproduce the installment of these futures and, thus, yield a performative function.

AI for Humanity and a Cybernetic Control System: Different Imaginaries

Germany, for example, focuses on AI applications in the manufacturing industry (also branded as *AI made in Germany*) and promotes an AI imaginary along ethical lines: "We want to use the potential of AI further to improve security, efficiency and sustainability in particularly important fields of application whilst also promoting social and cultural participation, freedom of action and self-determination for each and every citizen" (Nationale KI-Strategie, 9). Here, the German state commits to rather vague normative goals, nonetheless demanding commitment to the promises AI brings along. AI is connected to demands currently en vogue on political agendas, such as security (facing potential cyber and terrorist attacks), efficiency (facing international economic competition), and sustainability (facing the current threat of pollution and global warming). Even though not explained in detail, such terms are linked to liberal core values such as inclusion, freedom of action and autonomy, resembling the stark reference to the German constitutional framework in the German AI strategy papers.

In a similar vein, the *French* strategy commits to a humanist ethos, stressing to push AI into sectors that enable human flourishing: "[AI] Industrial policy must focus on the main issues and challenges facing our era, including the early detection of pathologies, P4 medicine, medical deserts and zero-emission urban mobility" (AI for Humanity web page). Further, Macron announces, "basically, we return to a new, very Cartesian stage of this faculty of being master and possessor of nature, and it is in this responsibility that we must always situate our action [. . .]. It is a moral responsibility, it is also the guarantee that our democracies will not succumb in some way to an Orwellian syndrome where technology is no longer an instrument of freedom, but a form of control authority" (SpMcr). In grand style, Macron portrays humanity as being at a turning point. The ostentatious presentation of his humanist vision is underlined by figures of philosophy and mythology (Descartes, Prometheus) and serves to create an imaginary of a moral bastion, offering the promise of technological advancement enabling humanist progress. AI is embedded in a philanthropic imaginary to overcome the pressing threats of humanity. It is blessed with an aura comparable to an undeniable fundamental right, a public good, a remedy that can relieve humanity from the vices of our era with the latest innovative technological achievements. Besides such philanthropic narratives, the Villani report claims that inside these transformative sectors, France can draw on its "economy's comparative advantages and areas of excellence" (VilRp, 9).

The *United States* takes a remarkably different stance on AI: "Artificial intelligence holds tremendous potential as a tool to empower the American worker, drive growth in American industry, and improve the lives of the American people. Our free-market approach to scientific discovery harnesses the combined strengths of government, industry, and academia, and uniquely positions us to leverage this technology for the betterment of our great nation" (WHSum, 2). Under the Trump administration, the vision of AI is articulated as an act of patriotism, equalizing the technological advancement of the American nation with the advancement of society as a whole. In this context, the term AI serves to unravel essential core values the Trump delegation regards as pivotal, such as empowerment of the American worker, strengthening local industry, or fostering a deregulating free-market approach. In contrast to the French statist vision, the Trump administration aims at removing barriers to AI Innovation "wherever and whenever we can to let American industry, American thinkers, and American workers reach their greatest potential" (speech Kratsios, WHSum, 11). The current Biden administration follows this nationalist narrative by

stressing: "The National AI Research Resource will expand access to the resources and tools that fuel AI research and development, opening opportunities for bright minds from across America to pursue the next breakthroughs in science and technology" (AIRRTF). In the US version, AI embodies the free spirit of American scientific ingenuity, the dedication of hardworking people in the rust belt, the competitive economic strength of a proud nation building on a long tradition of narratives of progress and America's culture of greatness (Marx 2000; Nye 1996).

Lastly, the *Chinese* AI imaginary points again in a different direction, with the Chinese Communist Party depicting AI as a tool for establishing social order and regulation: "Based on the goal of improving people's living standards and quality, speed up and deepen the applications of AI, increase the level of intelligentization of the whole society to form an all-encompassing and ubiquitous intelligent environment" (NgDpl, 18). Further, "AI technologies can accurately sense, forecast, and provide early warning of major situations for infrastructure facilities and social security operations; grasp group cognition and psychological changes in a timely manner; and take the initiative in decision-making and reactions—which will significantly elevate the capability and level of social governance, playing an irreplaceable role in effectively maintaining social stability" (NgDpl, 3). In order to meet such aims, the Chinese government targets the "smartification" and "intelligentization" of all possible societal fields. In the Chinese strategy papers, AI is interoven with other high-end technological buzzwords such as "smart city," "intelligent robotics," "Industry 4.0," or "facial biometric identification," sketching a totality of AI. Such visions of "data behaviorism" (Rouvroy 2013) or cybernetic governmentality through "environmental-behavioral control" (Krivý 2018) embody a SI where social order is established through a perpetual mode of citizen (self-)monitoring, adaptation, and optimization. The Chinese vision of AI enabling the "construction of public safety and intelligent monitoring and early warning and control system" (NgDpl, 20) echoes Jasanoff's portrayal of a sociotechnical aspiration for "simplification and standardization of human subjects so as to govern them more efficiently" (Jasanoff & Kim 2009, 122).

Lock-in, Path-dependency, and Performative Politics

With their national AI strategies, governments combine the narrative establishment of a particular moment in time that demands leadership (The Narratives of National AI Strategies: Talking AI into Being section) with

steering toward particular, country-dependent pathways (AI for Humanity and a Cybernetic Control System: Different Imaginaries subsection). Hence, national leaders seek to convert a field of lofty rhetoric, contingencies, and insecurities into a concrete path of action, aiming at the implementation of their policies through the performance of responsible intervention and leadership. By allocating substantial funding for AI research and business development, establishing normative principles and hard regulation, they constitute the crucial hinge where ideas, announcements, and visions start to materialize in projects, infrastructures, and organizations. Thus, the national AI strategies mark the departure point for country-specific trajectories, driving a process of closure for the integration of AI into society. This creates a process of path dependency that might even lead to lock-in effects down the road.

Borup et al. (2006) write that "after a time, or even rather quickly, expectations may be seen to exhibit certain material and social path dependencies (lock-in or irreversibility)" (p. 293). On the one hand, such a lock-in phenomenon can be understood as a strategic and desirable outcome for political advocates of a technology endeavor, as it embodies a successful manifestation of political will. When implementation has started and path dependencies are taking place, this also means that doubts and fears have been refuted, political critiques and opponents silenced, and political action that pushes into the desired technological direction prevails. Certainly, it is crucial to stress that, notwithstanding the powerful stakeholders that try to forward a SI, such as in the case of AI, their final realization and wide societal embedding will still meet resistance and skepticism, and will meet unforeseen obstacles, ranging from tedious patent litigations to sudden governmental downfalls. Hence, the process of political implementation and social and cultural embedding is anything but a linear progression from tech talk to technological reality, but a myriad of contested interactions.

Nonetheless, once governments proclaim bold promises, they are on the spot to deliver and perform their capabilities. Hence, on the flip side of the path-dependency phenomenon lays the pressure not to disappoint industry and citizens alike. "When expectations are shared they create a pattern into which the actors themselves may be locked" (van Lente and Rip 1998, 217). Such looming risk of lock-in can create additional pressure for the people in charge to deliver on substantial success. Certainly, at this point, national leaders are playing with the point of a costly return. "What starts as an *option* can be labelled a technical *promise*, and may subsequently function as a requirement to be achieved, and a necessity for technologists to work on, and for others to support" (van Lente and Rip 1998, 216). Politicians are

able to reinforce established and desirable pathways by demanding the commitment of society as a whole to an appealing imaginary, but simultaneously, their reputation is at stake if they fail to reach their proclaimed visions.

Conclusion

How to integrate AI technologies into the functioning and structures of our society has become a concern of contemporary politics and public debates. In this paper, we have addressed national AI strategies as a peculiar form of co-shaping this development. Constituting a hybrid of policy and discourse, governments offer in these documents broad visions and allocate resources and rules that seek to realize these very visions. We have situated this analysis in the context of approaches relating communication and future technology development such as SIs, the sociology of expectations, myths, and the technological sublime. In the empirical part, we were able to show that the narrative construction of the national AI strategies is strikingly similar: they all establish AI as a given and massively disrupting technical development that will change society and politics fundamentally. In consequence, the necessity to adopt AI across all key sectors of society is portrayed as taken for granted and inevitable. Yet, governments claim agency to shape those developments toward their respective goals along diverse normative principles. While the narrative construction thus is quite uniform, the respective imaginaries that articulate how to integrate AI into society and how to shape future developments are remarkably different. They reflect the vast cultural, political, and economic differences of the countries under study. Since governments offer future pathways in these strategy papers and endow these visions with massive resources and investments, they contribute to coproducing the installment of these futures and, thus, yield a performative function.

By identifying national AI strategies where ideas, announcements, and visions start to materialize in projects, infrastructures, and organizations, we contribute both empirically and conceptually to a better understanding of the nexus of politics, tech development, and discourse. With AI becoming ever more deeply integrated into our societies, we need to closely observe and comment on this process. Recent technological advancements in AI are severely hyped, and governments contribute to this hype, instead of acting as critical watchdogs, soberly assessing the risks and potentials. Their framing of discourses, opinions, and actions are as much enabling as they are restricting, disclosing a double performative, political role. As Powles (2018)

comments, "The endgame is always to 'fix' A.I. systems, never to use a different system or no system at all. In accepting the existing narratives about A.I., vast zones of contest and imagination are relinquished." This is the paradox of AI imaginaries: AI tales sound fantastic and trigger our fantasies, though simultaneously they actually undermine political imagination and political practice by raising expectations of a comforting technological fix to structural societal problems. While much of these debates is still quite controversial, we do seem to witness already a process of closure for a set of fundamental questions—and the national AI strategies certainly contribute to this. Today, AI is established as a key sociotechnical institution; it is considered as taken for granted and inevitable across many sectors already.

With this paper, we set out to systematically analyze the hype production of an emergent technology like AI. Most probably, the analytical scheme at hand is not limited to national AI production alone but can also help to demystify other technological hypes in the past, present, and future such as nanotechnology, quantum computing, and bioengineering. Such transferability is by now of course no more than a further research suggestion that has to be verified—which goes certainly beyond the scope of this paper. While the underlying technological functioning of these technologies is obviously remarkably different, the hopes and fears that are tied to them may be very similar. Future research clearly needs to further reconstruct how AI and other emergent technologies have come into being in the twenty-first century. But this is also the time that we as social science scholars need to contribute to shaping the debate and the actual developments of the specific future forms of technology, because discourse clearly matters.

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