Article

Artificial Intelligence, Legitimacy and Control

OLGA GIL *

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Departamento de Historia, Teorías y Geografía Políticas, Instituto Complutense de Ciencias de la Administración (ICCA), Universidad Complutense de Madrid

Abstract: In this work, a general framework for the analysis of governance of artificial intelligence is presented. A dashboard developed for this analysis comes from the perspective of political theory. This dashboard allows eventual comparisons between democratic and non democratic regimes, useful for countries in the global south and western countries. The dashboard allows us to assess the key features that determine the governance model for artificial intelligence at the national level, for local governments and for other participant actors. The dashboard allows us to appraise aims of AI strategy and aims left aside in alternative strategies. The work shows the theoretical framework could be of use to advance case studies globally, and comparative endeavors. Applying the theoretical dashboard, the case study on China has been undertaken. These are the main points the study tackles in the final discussion, conclusion and further recommendations: 1) the complex reality of AI command and control 2) uncertainties about future society and the polity against AI development and 3) particular cultural values enshrined in countries' AI development.

Keywords: Artificial intelligence; governance; philosophy; ethics; political theory; democracy

Introduction

At the end of 2020, Pfizer-BioNTech vaccine based on mRNA molecules made a breakthrough, allowing for a first treatment against the COVID-19 plague. The vaccine used modified RNA molecules and ferried them for the first time as a drug into cells. This vaccine was made possible with complexity, using algorithms departing from a strict digital approach to more complex algorithms incorporating layers, in the same ways that neurons branch out in the human brain. This fascinating breakthrough furthers -even more- the appetite for competition among the big actors: Google, Elon Musk, the Chinese government, among others, all wanting to reach a trillion operations in machine learning [1]. The example of the COVID-19 vaccine brings us the evidence of the importance of the use of algorithms for the good of humanity. From the point of view of physics and biology Contera [1] stresses that reality is not digital, it is analog, and therefore complex: Current artificial intelligence

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[1] BIO: With a breadth of experience in a range of educational settings, since joining UCM in 2011, Dr. Olga Gil focus has been on enhancing the student and researcher experience, with an emphasis on learning, teaching and mentoring. Gil is a researcher at ICCA and a professor in the Department of Political History, Theories and Political Geography at the School of Political and Social Sciences -over 6,500 students, teachers and administrative personnel- at Complutense University of Madrid. Gil teaches graduate and postgraduate courses (M.A. and Ph.D courses). Gil is a doctor in Political Science and Sociology (European University Institute, Florence, Italy, 2000), and earned a Master of Arts in Political Science (University of North Carolina at Chapel Hill, 1994) and a Postgraduate Diploma in Development and Latin America (UNC Chapel Hill and Duke University, 1994). Currently a member of ICCA (UCM), the Smart Cities and Smart Governments Research-Practice Consortium based at the Government Technology Center of the University of Albany, and evaluator of EU programmes since 2021 and MINECO (National Evaluation of Research Activity) since 2014. Dr. Gil has experience working at listed IBEX35 companies, Office of the Chairman, working for the UN at its New York headquarters at the UNIDO office, and as Economics reporter at the National News Broadcast TVE1.

seeks to achieve this complexity by including new parameters and new interactions. But there are limitations to this pattern of development towards complexity: the first is based on energy reasons - the cost of computations and the blockchain is very high. The second limitation is based on geopolitical reasons. Taiwan is currently the only country capable of producing a computing chip below the size of five nanometers [1]. This makes the United States, Western economies and the global south heavily dependent on a single company, TSMC, for the supply of leading edge technology chips. Only TSMC in Taiwan and Samsung in South Korea can make the most advanced semiconductors, and this, for the case of Taiwan exposure to China, is interpreted by the United States as putting at risk the ability "to supply current and future [US] national security and critical infrastructure needs" according to María Ryan [2,43]. This is evident when the United States Department of Commerce's Bureau of Industry and Security announces the implementation of export controls to restrict China's ability to both purchase and manufacture certain high-end chips used in military applications on October 7th, 2022. This actually means restricting China´s ability to obtain advanced computing chips, develop and maintain supercomputers, and manufacture advanced semiconductors. The same risk, and opportunities, are perceived by China and thus it could be interpreted when the Chinese Party Constitutional amendment made in October 2022 stating China's government as making sustained and steady progress with the One Country, Two Systems policy and advancing national reunification with Taiwan [3].

This work addresses the challenge of artificial intelligence from the perspective of political theory in China, bearing in mind the context and very interesting issues at hand: competitive interests and domestic preferences [4], economic development, national security and social control [5]. There are challenges in trying to tame the beast of reality -as the big actors are seeking to do with algorithms- and with the resources and human talent that is assigned for the task. These challenges make the study of current changes in artificial intelligence (AI) from the perspective of social sciences, and in particular from the perspective of legitimacy and democracy -or the lack thereof- interesting and acute. Other questions related to political theory also motivate this study: what can we learn about the **complex reality of AI related to command and control in China**? What may we learn about the **future society and the polity against AI development** in China? And, are there particular **cultural values enshrined in the country´s AI development**?

In the following sections, first of all the methodology and a general theoretical framework are introduced, the case study of sources of legitimacy and control in China follows, and finally a discussion, conclusions and further recommendations are presented.

Methodology

The selection of works started by a search in scopus with the terms artificial intelligence AND China in 2020, 2021, 2022. This brought about 776 works. The selection was further refined under the social sciences category, with 170 documents published matching the query. These works were reviewed looking for governance and legitimacy as topics for retrieval and further work, identifying 37 source articles. Once first relevant works were identified, the reference list of these works became a main source of materials, whether those were included in the scopus database or not, as detailed knowledge became crucial to build up the case study. Google scholar was also utilized, searching for the first 10 works on artificial intelligence and social sciences, the 10 most cited works, and the ten most recent ones. These works were reviewed searching for interesting insights. Proquest database has also been consulted, with the query artificial intelligence in the Financial Times newspaper. Specific articles on the query were of value to identify authors with new ideas on artificial intelligence nowadays and how AI affects governance.

As a result, these searches brought about information from comparative reports such as The World Bank, learning that China's State Council's AI aimed to become a world leader in AI by 2030 [6] (World Bank, p. 24) and the work of [7] Ding (2018), learning that China's State Council's AI plan was not the starting point of China's AI planning, because local AI ecosystems existed previously, and were also very varied (Ding, 2020, p-14-15). As Jeffrey Ding contends, previous plans had been enacted by local governments and companies that were already engaging in subnational planning on

AI. Past science and technology plans were also a root of the China State Council´s AI plan –which is a common trait in other Chinese driven technological developments. Working exhaustively with Jeffrey Ding references in published works [5,7] (Ding 2020, 2018), and going for new references from his bibliographies was paramount to compile resources to study sources of legitimacy of AI in China. The analysis of the case is limited by the data gathered, but both the data compiled and the theoretical framework proposed probe sufficient to draw conclusions consistent with the motivations of the study: understanding sources of legitimacy and control for AI in China.

Definitions

The definitions of AI and AI-related industries in the Chinese AI plan are broad [7] (State Council 2017): some AI plans differentiate core AI technologies from other related technology types like smart vehicles, smart wearable devices, or smart robots. Under this conceptualization, core AI would include companies innovating in AI architecture, while AI-related industries would include parts of the AI focused on applications in specific industries. The purpose of this work is not to make a discussion on competing definitions of AI, thus we accept this broad definition for the particular purpose of this paper.

Dashboard to study legitimacy and control

The theoretical framework selected for the analysis of AI in the context of the case studied has been developed from the work on legitimacy published by Craig Matheson [8]. Matheson opposes and qualifies Max Weber. For Weber there are three types of domination: charismatic, traditional and rational or legal [11]. Weber distinction among the three types of domination is based on the legitimacy of the power-holder. The work by Matheson, instead, looks upon both the power holders and the power subjects: therefore, Matheson broadens the scope and he develops a framework with eight types of domination. The main critique that Matheson introduces to Weber's work is that democracy and its effects along the XX century are not reflected in Max Weber typology. Matheson reaches new layers of granularity for the study of the polity and society with his revised proposal from a political theory perspective that is useful for all sciences. The following table from Matheson´s critique of Weber has been developed now. The table explains visually the eighth types of domination: An eight dimensional view of sources of legitimacy.

Table 1. Sources of legitimacy, by the author.

Convention	Norms, rules: legal or customary rules that prescribe forms of behavior
Contract as basis of legitimacy	Mutual rights and obligations. The theory of consent as the basis of obligations
Basis of legitimacy in a conformity with universal principles: natural law	Theories of natural law, aka, the existence of a natural order superior to man-made law
Sacredness of authority	Power-holder or his/her norms considered to be sacred divine right of reigns. For Max Weber it could also be an attribute of an office rather than a person.
Legitimation by expertise	Technical expertise, in the vein defended by Saint-Simon, Taylorian theories, or historic laws
A popular mandate in a constitutional democracy	Popular mandate: a claim to democratic election in accordance with constitutional procedures. Based on constitutionalism, power holders elected

	in accordance with constitutional procedures. Here we find a distinction between populist democracies, where the will of a majority rules, and constitutional democracies, were there will of the majority is limited by a constitution
Personal relation	Domination in which there are close ties between power-holders and power-subjects such as personal authority or paternal authority relationships
Personal quality of the power holder	Domination based on the personal quality of the power holder, by virtue of which he/she can claim a right of command

The methodological work has proceeded as follows. First of all, looking at this framework based on the eight dimensional view of sources of legitimacy, observations about sources of legitimacy for AI are drawn. Secondly, observations about sources of legitimacy that would be out of the scope of the table above are also made. In so doing, the new sources of legitimacy are incorporated in **Table 2** in order to develop the Gil Dashboard, allowing us to analyze artificial intelligence from a comparative perspective. The sources of legitimacy are incorporated close to the category that is more akin to the concept, if any. Additions have been included in bold text. Observations are discussed in the section below, and are included in the Dashboard.

Commenting on the table, when confronted with questions and explanations about regulatory processes in AI, there is a need to stress the importance of first level theoretical explanations. First level theoretical explanations in political theory would have to do with regime types, and within regime types, with two elements: First of all, risks of democratic failures among democratic countries, and secondly, the risk of regime failures. These risks of regime failures could be linked, for instance, first and foremost to the unexpected, or to elections, to deep fakes, misinformation, transparency, responsibility, the importance of war, and the war on ideas among world competing political regimes.

Table 2. The Gil Dashboard: sources of legitimacy to analyze artificial intelligence where the bold case reflects additions departing from previous conceptual frameworks –both Weber and Matheson.

1.	Convention	Norms, rules: legal or customary rules that prescribe forms of behavior
2.	Contract as basis of legitimacy	Mutual rights and obligations. The theory of consent as the basis of obligations
3.	Basis of legitimacy in a conformity with universal principles: natural law	Theories of natural law, aka, the existence of a natural order superior to man-made law
4.	Sacredness of authority	Power-holder or his/her norms considered to be sacred divine right of reigns. For Max Weber it could also be an attribute of an office rather than a person.
5.	Legitimacion by expertise	Technical expertise, in the vein defended by Saint-Simon, Taylorian theories, or historic laws
6.	A popular mandate	Popular mandate: a claim to democratic election in accordance with

	in a constitutional democracy	constitutional procedures. Based on constitutionalism, power holders elected in accordance with constitutional procedures, and accountability is important. We find a distinction between populist democracies, where the will of a majority rules, and constitutional democracies, were there will of the majority is limited by a constitution
7.	**Improved democracies through method**	**A type of legitimacy based not only in a popular mandate but experimenting with method and in a continuous process in order to reach better results, including accountability**
8.	**Regimes -non democracies- developed through method**	**A type of legitimacy based on experimenting with method and a continuous process to justify the reach results**
9.	Personal relation	Domination in which there are close ties between power-holders and power-subjects such as personal authority or paternal authority relationships
10.	Personal quality of the power holder	Domination based on the personal quality of the power holder, by virtue of which he/she can claim a right of command
11.	**Coercion**	**The use of power to influence someone to do something they do not want to do, from exerting fear to nudging –positive reinforcement**
12.	**Societal cooperation, excluding the polity**	**Development of mechanisms of cooperation among the public sector, industry and academia: cooperation is achieved with voluntary mechanisms including best practices, ethical codes of conduct, and guidelines –**for the Chinese case with special mention to the tripartite economy
13.	**The political economy**	**Economic governance, a baseline**

The case study undertaken below brings us in a dialogue with the Dashboard, including 13 sources of legitimacy to analyze AI, and it allows us to make further adaptations to the proposed Dashboard, in order to make it useful as an explanatory model. Later on observations are written down applying it to the case of study.

Applying the Dashboard to study legitimacy and control: Artificial intelligence in China and openness to comparative perspectives

In this section we analyze sources of legitimacy using the author´s Dashboard in the Chinese case. The work proceeds with a quantitative analysis (where 1 is existence and 0 absence), and a qualitative analysis follows. The subsections explain those features that have proved existing.

Table 3. The Gil Dashboard on sources of legitimacy and control: an application to China, conceptual and quantitative analysis.

Source of legitimacy	Quantitative analysys	Qualitative Analysis
Convention	1	Norms, rules: legal or customary rules that prescribe forms of behavior
Contract as basis of legitimacy	0	Mutual rights and obligations. The theory of consent as the basis of obligations
Basis of legitimacy in a conformity with universal principles: natural law	1	Theories of natural law, aka, the existence of a natural order superior to man-made law: *a set of laws*. The set of laws is defined in this work in a restrictive and uncritical way, for reasons of focus and lack of space.
Sacredness of authority	0	Power-holder or his/her norms considered to be sacred divine right of reigns. For Max Weber it could also be an attribute of an office rather than a person.
Legitimacion by expertise	1	Technical expertise, in the vein defended by Saint-Simon, Taylorian theories, or historic laws
A popular mandate in a constitutional democracy	0	Popular mandate: a claim to democratic election in accordance with constitutional procedures. Based on constitutionalism, power holders elected in accordance with constitutional procedures, and accountability is important.
Improved democracies through method	**0**	**A type of legitimacy based not only in a popular mandate but experimenting with method and in a continuous process in order to reach better results, including accountability**
Regimes -non democracies- developed through method	**1**	**A type of legitimacy based on experimenting with method and a continuous process to justify the reach results**
Personal relation		Domination in which there are close ties between power-holders and power-subjects such as personal authority or paternal authority relationships
Personal quality of the power holder		Domination based on the personal quality of the power holder, by virtue of which he/she can claim a right of command
Coercion	**1**	**The use of power to influence someone to do something they do not want to do, from exerting fear to nudging –positive reinforcement**

Societal cooperation, excluding the polity	**1**	**Development of mechanisms of cooperation among the public sector, industry and academia: cooperation is achieved with voluntary mechanisms including best practices, ethical codes of conduct, and guidelines**
The political economy	**1**	**Economic governance, a baseline**

Convention

The first source of legitimacy and control that we can draw from this table and apply to the Chinese case is convention. It could be argued that in China there are **general changes in convention as a source of legitimacy**, understood as norms, rules –legal or customary rules- that prescribe forms of behavior.

The mode of social governance has implications in China's choice of adoption of AI technologies. As Ding states [7], the State Council's AI plan sees AI playing an irreplaceable role in maintaining social stability. In practice, this is reflected in local-level integrations of AI across a broad range of public services, including judicial services, medical care, and public security [8]. Specially affecting the mode of social governance are two areas, the first one, concerning privacy, and the second concerning private companies participation in social credit systems [42]. AI proves a good tool improving efficiency and reach of services, however it is a less desirable tool for complex areas where context, emotional judgment, flexibility and moral judgements are crucial.

In the case of the social credit system, Lewis defines it as an initiative based on a cluster of experiments harnessing public data with the aim to improve governance [11]. This improvement seeks to boost trust among government, firms and individuals, and includes larger national efforts - the Blacklist-Redlist Joint Sanctions and Rewards regimes- as well as smaller efforts being implemented in some cities. Lewis defines it as:

> "an overarching policy initiative consisting of multiple sub-systems (…) with different policy goals and rules, rather than one distinct system. Ambitiously, it takes aim at nearly all of China's development ills – from environmental protection to IP and financial fraud to academic plagiarism" all of which the Chinese government believes stems from firms and individuals not following laws and regulations" [8].

The baseline, according to the Chinese government, would be to enshrine trust in order to develop a market economy [11]. An important loophole, however, is that individuals or firms have little knowledge about the data collected. Lewis recalls that the black list regime has been reinforced and had real implications for business and individuals, but it is difficult to be conclusive about whether policy is truly achieving the general goal of business and individuals behaving in a more trustworthy manner [11], and more generally, whether the system improves trust in Chinese institutions. This is a baseline for society, in the case of the Chinese polity, and increasingly capable security state where AI technology is starting to play a decisive role [12].

General changes in convention as a source of legitimacy, understood as norms, rules –legal or customary rules- that prescribe forms of behavior are the aim of AI scoring systems assigning a credit to the population with the aim, according to the government, to improve societal trust. Xiamen and Fuzhou are two examples of cities that have implemented score systems for their population since 2018. Xiamen has over 85,000 users exchanging their scores to avail services. Fuzhou has over 1,19 million residents doing the same. Scores look at the behavior of residents, and the individual participation such as keeping promises as measure of responsibility and trust, while a breach of contracts would be contemplated as unwillingness to obey the law. A system of credit repair has been invented, with the possibility to gain credit back through active participation in social service, public interest events and welfare activities. These are mechanisms to change traditional convention. Other mechanisms are local scores looking at hard working, observation of ethics and morals, as defined

by the government, delayed payment, the follow up of administrative regulations and legal duties. Danit Gal [11] argues that mechanisms of credit scoring exist in other countries such as the United States [13–15,17,39,41], however, the level of development and deployment in China makes it unique in scale.

It could be argued that changes in **convention and social cooperation** affect innovation ecosystems as well. Ding remarks how the central government's important guiding role in China is targeted by other **public and private actors**, pursuing their own objectives in AI, including academic labs, bureaucratic agencies, private companies and subnational governments [7]. Many actors involved have resulted in rapid innovation in many fields, based in **local innovation ecosystems**. By the end of 2018, 20 provinces had issued 30 specific AI policies "many forward thinking local governments implemented AI-related policies that preceded national government action" [7]. The pragmatic approach to innovation has resulted in important developments in the fields of healthcare, medical image processing and pharmaceutical research. Kim describes the ecosystem of actors as a hybridized industrial ecosystem including firms, networks of small and medium enterprises and research institutes specially adapted to the local conditions [17]. Ding emphasizes the importance of specializing in AI subdomains, and he actually stresses the importance of specialization in AI subdomains or parts of the value chain as clues to success [5]. Ding also stresses that in a new vein, transparent budget disclosures show allocation to companies in subdomains ranging from predictive analytics of smart city data to sign language translation [5].

An example of a hybridized industrial ecosystem has been the **Hangzhou AI Town** opening for business in July 2017 –inspired by visits from local leaders to Silicon Valley and searching for similar spillovers. The mission of this local ecosystem has been to link together the e-commerce company Alibaba and subsidiaries -with more than 90 per cent of the projects in some categories-, Zhejiang university, graduates studying overseas and local businesses in a cluster. The creation of the AI park is housed in the Hangzhou Future Sci-Tech City, connected to a larger infrastructure of science and technology parks [5]. This local industrial ecosystem has been designed with international linkages in mind, and thus Silicon Valley Bay area council has an office helping Californian companies to register enterprises, and Hangzhou AI Town, in turn, has offered 3 million RMB for settlement expenses, and 15 million RMB in subsidized office space costs [5]. An additional aim for Hangzhou AI Town managers has been attracting talent, such as returning Chinese graduates from international universities [18], but not exclusively Chinese: recent measures restricting the support of development, production, and semiconductor fabrication by United States nationals in China show that global talent attraction was also a key in this local development model [19]. In **Hangzhou AI Town,** Alibaba functioned as anchor tenant, a necessary condition for AI development success that is also found in other Chinese local ecosystems [5]. Jeffrey Ding also speaks of elite universities, such as Zhejiang University for Alibaba as a glue to hold the ecosystem together, and the existence of large technology firms as a requirement to enhance productivity and local innovation [5].   The involvement of private actors, however, brings in the risk of inequality [20]. In order to avoid inequalities and the marginalization of social groups, the adoption of AI educational tools has been defended as a need, as well as better comprehension about how innovation may prevent the marginalization of less favored social groups.

Contract

On observation about sources of legitimacy we find that the appeal to contractualism is absent as an instrument of legitimacy.

Basic of legitimacy in conformity with a natural law: Ethics as a set of laws

Legitimacy is the following category existing in our quantitative analysis. **Legitimacy** to set up AI in public services in China has been driven according to Rogier Creemers by the ideological view that **social order is governed by an objective and a determined set of laws** where AI can solve social problems and help to understand those laws [21]. In this context, AI is generally designed to improve existing institutions, not to replace or reform them, and policies integrating AI play an important role.

Policies are at the center of this short of approach in which national, local and company levels concur, and where public-private partnerships occur often. Policies focus on speeding up technology development, data collection and implementing pilots. Issues such as accountability, data privacy, and risk management appear to be secondary to crucial developments. We find legitimacy based in universal principles: ethics in the case in China which has led to the development of AI outside the umbrella of the state. That echoes the findings of Gianni et al., in an applied comparison of national AI strategies in nine countries, including China and the United States [22]. The Chinese case reflects that the source of legitimacy for AI governance entails cooperation among the public sector, industry and academia. This is **AI development outside the umbrella of the state, based in ethics codes [23].** In this particular conception of ethics, cooperation is achieved with voluntary mechanisms including best practices, codes of conduct, and guidelines. In general terms, at the core of a general approach to use ethic guidelines as an efficient measure to prevent or reduce harm caused by AI the general argument is for its higher flexibility, as opposed to hard regulations that could represent an obstacle to economic and technical innovation [22], or other means of legitimacy.

In China's approach to ethics there is a basis of legitimacy in a conformity with a call to **universal principles**, were harmony, as principle in Chinese philosophy for all life forms [24] would be relevant in the contexts of human-machine interactions [12]. The call to universal principles making a reference to harmony is furthered in a new document addressing human-machine harmony, and more specifically stating in article n. 1:

> "AI development should begin from the objective of enhancing the common well-being of humanity; it should conform to human values, ethics, and morality, promote human-machine harmony, and serve the progress of human civilization; it should be based on the premise of safeguarding societal security and respecting human rights, avoid misuse, and prohibit abuse and malicious application [25, their translation]."

Multi-stakeholder committees have been settled outlining AI ethic principles, many of them according to global standards [26]. An additional challenge is to bring a number of relevant stakeholders into key conversations on AI ethics, both internationally [12] and at the national level. There have been expert groups, including several companies, business associations and expert groups releasing principles, and the New AI Governance Expert Committee, created by the Ministry of Science and Technology and stating that AI should conform to safeguard social security and respecting human rights, according to Creemers [21]. Interpreting this statement would make us close to Chinese Communist Party ideology, which in the aftermath of the 20th National Congress of the Chinese Communist Party closing in 22th October 2022 is driven by a top down hierarchy, with General Secretary Xi Jinping on top, and 90 million Communist Party members: As Xinhua relates, "Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era (...) should be incorporated into the Party Constitution (...) with Comrade Xi Jinping at its core to advancing the Party's theoretical, practical, and institutional innovations." [3,41]

Sacredness of authority and improvement of democracy thorough method

Sacredness of authority is absent, as well as improving democracy through method and personal relation.

Method as a source of legitimacy

Whereas method is the base to reach new knowledge following the scientific revolution in Europe, method, in contrast, has not been institutionally embedded as a basic feature to improve democratic -or undemocratic- governments. The result is that there has not been an appraisal of method as a way to reach better social results in democracies. The sources of legitimacy linked to method deserve further elaboration. Matheson's approach to sources of legitimacy reviews Max Weber work making important contributions. However, the search of **improved democracies through method as a source of legitimacy** is not included in Matheson analysis. A type of legitimacy

based in experimenting with methods and in an active process, not only based on a popular mandate, to reach better results. The work by Gianni et al. comparing national AI strategies in nine countries, including China and the United States stresses the lack of concrete mechanisms for inclusion of civic society and public engagement in AI control [22].

In China privacy could be included under the heading of improvement through method. Data privacy efforts have been addressed in laws and regulations [21,27,28].

AI education systems are an example. Chinese AI educational systems have been collecting, storing and analyzing students' facial expressions without regulation [12]. Facial information has been also collected through boards subways, enforced recycling and the obtention of toilet paper in public toilets, raising many public concerns and establishing a culture of pervasive individuals monitoring [12]. There is no limit in government access to and use of private data. At the same time, without transparency of knowledge about how the variables to calculate scores work, the possible divide between low and high scores may increase. In the case of education we could argue AI development in China is experimenting with methods or a continuous process, and justifying the reach of better results. However, as Liu argues, high-quality education involves creativity, collaboration and critical thinking, and for those aims, the role of just AI technologies for the next generation of students is more limited [29].

Basis of legitimacy in conformity with expertise

Pointing at sources of legitimacy and control in China, expertise is the following category that exists in our analysis. Legitimation by expertise is in fact on the basis of economic governance in China. Legitimation by expertise is very ingrained in the AI strategic plan designed by the China´s State Council in 2017. This is also the case in the plan when calling for the development of a whole range of AI related healthcare technologies to put cognitive computing at the service of learning, recalling and appling vast amounts of text works for medical professionals. Expertise as a basis for legitimacy is reported by Karen Hao at The Wall Street Journal:

> *"Chinese leader Xi Jinping has packed the top ranks of the Communist Party with a new generation of leaders who have experience in aerospace, artificial intelligence and other strategically important areas (…) Chinese officials with technical expertise occupy 81 seats, nearly 40% of the total, in the new Central Committee—the elite body that decides major national policies—according to data compiled by the Washington-based Brookings Institution think tank and shared exclusively with The Wall Street Journal. That compares with less than 18% in the previous Central Committee." [30]*

Legitimation by expertise has also been applied to the judiciary

It is the baseline for System 2016, which is Shanghai High People's Court Intelligence assistive case-handling system for criminal cases. The purpose of the system is to improve the quality and reduce   false, unjust or wrong changes and sentences [31]. Eugeniu Han explains that the system has two components, a cross reference system using speech recognition to compare different types of evidence and alert the judge about contradictions in the judge patterns [31]. The second component is a sentencing reference tool based on machine learning combining the defendants basic information and a large database of past court records to make sentencing recommendations. The system can also be used to judge the judges and prosecutors by pinpointing the outliers [31], moreover, applications within System 2016 could skew a prosecutor or judge to the detriment of the defendant. Han stresses that defendants and their defenders may lack the technical knowledge, resources and access to challenge AI processes for generating a sentencing reference and assess its potential biases [32]. Gal suggests another loophole since Alibaba is usually the defendant in many cases while is also the co-creator of the smart court: conflicts of interests are clearly at stake, "exacerbating legal accountability for decisions made by using these systems" [12]. Gal pinpoints that the use of AI to support the court system is the case in other countries, what is unique to China is a "smart court and an AI judge

handling claims against a corporate actor, while also being developed by the same corporate actor [12].

An additional tool contributing to **legitimation by expertise** is City Brain, a system first launched for traffic management in Hangzhou in 2016 with the aim of tackling traffic congestion. City Brain was developed by 13 companies together with the city government and based on Alibaba cloud platform service: The firm optimizing traffic has developed into a data coordination center consolidating data from over 700 IT government agencies. This data coordination center offers services for parking, traffic management -including ambulances and firefighters- waste collection and even health monitoring of the city's aging population [31]. With different modifications City Brain has been implemented in more than 10 cities in Asia, sometime under the umbrella of the Belt and Road initiative of the Digital Silk Road [33].

Following expertise, in 2018 the Guangzhou Women and Children Medical Centre developed an AI prototype using NLP and deep learning to work with relevant information from 1,4 million patients to help frontline patient care, for instance triaging patients to decide degrees of urgency. Some other examples include AI deep learning to recognize visual symptoms: here researchers have been using AI to scan and diagnose congenital cataracts, where an estimated 200.000 children are bilaterally blind from cataracts annually (Chun 2020, p. 20). In some of the AI developments blockchain technology is used to ensure trust in data stored in the system (Chun 2020, p. 19). Andy Chun explains that Alibaba and Tencent are investing to interpret scans and to detect early signs of cancer (2020, p. 20). In July 2019 the Chinese startup JF Healthcare -specialized in providing remote diagnosis services for rural town hospitals where radiologists are not available often- was the first to beat Stanford University radiologists. This approach to AI development is based on **experiment and innovate first** and it seeks to achieve time to market results in fields as important as medical care (Andy Chun, 2020, p. 19): Here AI is seen as possible solution to doctor shortage -China has two practicing doctors for 1000 inhabitants- to scarce medical services in rural areas, and to highly strained services in rural areas due to large patient volumes (Chun, 2020, p. 19).

Table 4. AI health related technologies in China in the 2017 China´s State Council Plan.

Intelligent diagnosis
Wearables
Artificial Intelligence health monitoring
Robot-assistance surgeries
Intelligent medical image recognition
Medical genomics
Elderly care
Capturing general medical knowledge, with the ability to understand the intricate connections between facts and the use of them to make decisions.

Basis of legitimacy in conformity with nudging –positive reinforcement versus coercion in China

In our Dashboard on sources of legitimacy and control, coercion is the following category existing in the quantitative analysis. For the purpose of our model, albeit with a difference, we draw a similarity between coercion and nudging. There is nudging attached to wearable technology, with over 52 per cent of inhabitants in China using this technology able to monitor their health. Insurance

companies such as Ping An Health have integrated wearables into their offers to facilitate discounts and rewards to customers sharing data and living healthier lifestyles [37].

The political economy: Economic governance, a baseline

The economic governance of AI in China has laid on the increase of total fiscal expenditures on science and technology rising from 48 per cent in 2007-2011 to 59 per cent in 2015-2016 [34]. Provinces and local governments have significant autonomy in the implementation of these funds, and from different approaches [35]. There are local unbalances in AI development, with three cities being home to 70 per cent of AI firms: Beijing being home to 43 of Chinese firms, Shanghai at 15 per cent and Shenzhen at 12 per cent [36].

Table 5. Targets for AI and AI-related industries by 2030.

By industry	Expected gross output
Core AI industry	RMB 1 trillion
	(U.S. $150.8 billion)
Related industries	RMB 10 trillion (U.S. $ 1.5 trillion)

Following with expertise, the mode of **economic governance** has not been based on cutting edge technologies in China. The mode of economic governance, instead, has been based in rapid deployment and scaling of existing AI technologies [36]. The results have been fusion and speed over breakthrough technologies, and ensuring the adoption of existing technologies. Adoption and scale have been the formulae for AI implementation, both in the private and the public sector. This is very much in contrast with the case of European countries, where deployment of AI technologies at the local level remains very low [38]. An additional key in **economic governance** has been the attraction of global and supra-local linkages by ambitious policy makers searching for increased access to capital and other AI ecosystems, such as those in cities including Amsterdam, Barcelona or Stockholm, and clusters forming around Cambridge, Oxford and Manchester –with an AI ecosystem around Manchester university and home to the government communications headquarter. Another component in **economic governance** has to do with the objective to reduce policy fragmentation. In order to do so, local governments are incentivized to develop plans that can be later used to assess progress and to induce competition between different regions and localities [31].

Discussion and conclusions

In previous pages there is an attempt to analyze the governance of artificial intelligence. At a theoretical level, the Gil Dashboard for AI has been developed for this analysis. The Gil Dashboard for AI helps to unveil a complex reality, where AI comes with new rules attached to command and control in political and social theory. The Gil Dashboard for AI shows how regime governance affects and mediates problems related coordination and control. It also helps to relate democracy to AI, and apply the grand theory to realities on the ground. The Gil Dashboard also allows comparisons between democratic and non democratic regimes, with a special focus in this work on China as a case of study. However, it could be applied to other countries, both in the global south and western countries. Generally, the theoretical framework could be of use to advance case studies globally, and comparative endeavors. At a general level, the Gil Dashboard could allow us to assess the key features of a governance model for artificial intelligence at the national, local governments and for other participant social actors. At a more specific level, the Gil Dashboard for the study of AI presented in the theoretical part of this work allows us to appraise aims of AI strategy and aims left aside in practical cases.

This work has addressed 1) the complex reality of AI command and control, that we can appreciate in the Dashboard developed; 2) the uncertainties about future society and the polity against AI development when we apply the theory to a particular case; and 3) particular cultural values enshrined in countries' AI development. Applying the theoretical dashboard, the case study on China has been later undertaken.

Further work

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