

Everyday legitimacy practices and the algorithmic turn in the administrative state

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Abstract

By operationalizing how public policy is enacted, government algorithms play a key role of *public administration* – a role traditionally occupied in the U.S. by the wide range of bureaucrats and agency experts that comprise the administrative state. At stake is not just the functioning of these agencies but their perceived *legitimacy*, which has long been a subject of debate. While scholarship has drawn attention to the ways that agency algorithms can bolster (and undermine) legitimacy, this neglects the way that legitimacy is performed and negotiated. Focusing on the use of algorithms within federal agencies, we argue that agencies' *everyday legitimacy practices* are a crucial site where the meaning of administrative legitimacy is negotiated. Through their routine operations, agencies shape the role of the administrative state by embracing certain tactics to defend their authority and autonomy from external intervention. The adoption of algorithms in agency operations marks an important site of negotiation, revealing a shift in what makes agency authority legitimate in the eyes of the state. Drawing on over fifty years of Government Accountability Office (GAO) reports, we empirically examine how algorithms reshape the values, goals, and logics of legitimacy. By systematically examining GAO's everyday legitimacy practices, we demonstrate that the algorithmic turn within government agencies is not new, but part of a longer history of quantification. We show how the history of bureaucratic quantification, including the adoption of algorithms, has changed how administrative legitimacy is understood and performed across the government, with value-laden consequences.

Keywords

legitimacy, quantification, algorithmic governance, algorithmic accountability, efficiency, public administration

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Introduction

In the United States, experts within administrative agencies play a critical role in overseeing complex social problems and responding quickly to emerging issues. Yet the authority of agency policymakers—who are appointed rather than elected—and the legitimacy of the administrative state more fundamentally have been the subject of debate for as long as these agencies have existed (Bressman, 2003; Beermann, 2024; Fisch, 2024). Early models of public administration located the legitimacy—and value-neutrality (Seidenfeld, 1994)—of agency decision-making in apolitical scientific expertise and fidelity to congressional statutes (Seifter, 2014). However, the interpretation and implementation of policy requires managing ambiguities inherent to both law and science (Kumar, 2025; Larkin, 2020). Whether agency officials have the authority to resolve such ambiguities, and how those ambiguities are resolved, has thus long been a locus of political tension.

Ambiguity invites quantification. The quantification literature has shown how, why, and when bureaucracies turn to numbers to establish legitimacy. Quantification generally, and algorithms specifically, are of particular use in the face of ambiguity; the quantification literature is clear on this front. Historically, agencies have emphasized quantification to assert legitimacy in contexts where trust and consensus are difficult to come by (Porter, 1995). This literature shows how the institutionalization of quantification in public administration implies shifting values, goals, and understandings of legitimacy (Berman, 2022; Hacking, 1982).

The adoption of algorithms within agency operations is reanimating many long-held anxieties about the legitimacy of the administrative state (Abdu and Jacobs, 2024). Shifting authority within bureaucracies raises questions as to whether and how this authority is legitimized (Hong, 2023). Despite substantively overlapping concerns and mechanisms, the literature on quantification in public administration has been largely disconnected from the literature on algorithmic legitimacy and public administration. (We will return to the relevant quantification literature and the emerging algorithmic governance literature in following sections.) In this article, we propose that the algorithmic turn in public administration is part of a longer legacy of quantification in government. In doing so, we echo earlier calls to situate the data-driven governance movement in government within the broader epistemology of quantification (Rieder and Simon, 2016).

So what then is at stake for the legitimacy of the administrative state? Administrative law has long emphasized the legitimacy and authority of agency experts by appealing to their efficiency, mitigating their capacity for arbitrary decision-making, and expanding their accountability (Bressman, 2003; DeCanio, 2021). We see echoes of such longstanding legitimacy practices in contemporary debates about agency uses of algorithms to administer policy.

Scholars have, for instance, emphasized algorithmic systems' capacity to enhance legitimacy through efficient and fair administration (Engstrom et al., 2020) and to make policy decisions visible (Levy et al., 2021; Coglianese and Lehr, 2019). More commonly, the literature has highlighted the challenges that algorithms pose to administrative legitimacy: making decisions more opaque (Pasquale, 2015), displacing decision-making power (Cooper et al., 2022; Mulligan and Bamberger, 2019), threatening expert deliberation (Calo and Citron, 2020), and eroding public participation and oversight (Citron, 2007; Kroll et al., 2017).

That is, the literature on algorithms in public administration has primarily focused on *whether* algorithms advance or threaten legitimacy (Ajunwa, 2023; Calo and Citron, 2020; Waldman,

2019). In contrast with the broader quantification literature, little attention has been given to the particular circumstances under which algorithms are used to advance administrative legitimacy—and where they are not. We examine this question to illuminate *how* new technologies are not merely upholding or undermining existing static conceptions of legitimacy, but are also reshaping the enactment of legitimacy altogether. Despite the centrality (and tenuousness) of legitimacy, remarkably little empirical work has been done to examine how legitimacy is enacted in the administrative state.

Through a systematic qualitative analysis of reports and testimonies published by the U.S. Government Accountability Office (GAO), we explore how the turn toward algorithms in agency policy-making is transforming administrative legitimacy and its underlying values. Specifically, we examine how GAO conceptualizes the risk and promise of agency use of algorithmic technology and what values they point to in order to establish the legitimacy of incorporating algorithmic systems into governance processes. We contextualize the algorithmic turn in U.S. public administration within the legacy of non-algorithmic forms of quantification and broader histories of administrative legitimacy. We attend to both continuities and discontinuities with this history, identifying where algorithmic technologies have new implications for legitimacy.

The GAO is a compelling study site for several reasons. GAO oversees many federal agencies, thereby engaging with algorithmic governance across a wide range of contexts. Their official charge is to ensure accountability, but we observe a collision of accountability and efficiency through the GAO's history of accounting practices and reliance on efficiency metrics to enact accountability. GAO's oversight crosses political boundaries: its emphasis on non-partisanship makes visible long term trends in government oversight, and their political leadership serve long terms (15 years), but Congress's political interests can be reflected through their request for certain oversight. Moreover, GAO is politicized when accountability and the role of government are at stake: President Ronald Reagan (1981) said that appointing the Comptroller General of the GAO was "one of the most important appointments that I shall make as President" as the leader who will oversee the restoration of "integrity and efficiency of government." Yet, these moments of politicization reflect GAO's more routine oversight, which implicitly establishes what constitutes a legitimate exercise of agency authority. Through its oversight of algorithms, GAO shapes how these technologies reallocate decision-making power within the administrative state.

By examining the algorithmic turn within the longer history of bureaucratic quantification, we identify where negotiation around agency adoption of algorithms transform the values, goals, and logics underpinning legitimacy. We explore how the values underlying legitimacy in the algorithmic context are negotiated across different legitimacy practices—around efficiency, non-arbitrariness, and accountability—and we reinterpret the administrative state's algorithmic turn in this larger context. Ultimately, this work reveals a unique role for "efficiency" in the past and future of the administrative state.

Legitimacy

We focus on administrative *legitimacy practices*, i.e., the tactics used to demonstrate and enact the legitimacy of agency authority. We discuss prevailing concepts of legitimacy, arguing that, while distinct, these notions are fundamentally relational. In the administrative state, the central relation in question is not between authorities and the public, but between authorities and the democratic

institutions designed to provide checks and balances on their power. We lay out how agencies' everyday legitimacy practices, though performed for the state, reflect particular ideas about what their relationship to the public ought to be.

Legitimacy Practices

The meaning of political legitimacy is contested and ambiguous, appearing within the literature as both a moral and a sociological concept (Buchanan, 2002; Harfst, 2022). When studied normatively, legitimacy refers to a moral justification of authority (e.g., Buchanan, 2002; Rawls, 1971; Stone and Mittelstadt, 2025). On the other hand, when studied descriptively, legitimacy typically refers to people's beliefs about authority and the conditions under which they are willing to submit to authority (e.g., Martin and Waldman, 2023; Tyler, 1990).

Shared across these conceptualizations of legitimacy is that legitimacy is defined relationally: between actors, within or between organizations, to account for notions of responsibility, recourse, or permissibility (Tyler, 1997). However, missing from both these perspectives is an examination of how those with authority shape legitimacy. Because legitimacy is fundamentally relational, it is not only defined by those who submit to authority, but also by those who exercise it. Indeed, Rodney Barker notes that the state, rather than those it governs, "is the principal user of the language of legitimacy" (Barker, 1990, p. 159). We follow Laura Nader's call to "study up," (Nader, 1972) adopting a new perspective on common question by devoting attention to powerful institutions. We argue that the state shapes what is a permissible exercise of authority through its own norms, policies, and rhetoric. For example, Nicholas Bagley describes how administrative lawyers, in invoking agencies' legitimacy deficit, create the conditions for proceduralism to constrain agency officials' authority (Bagley, 2019). Understanding how legitimacy is constructed therefore requires understanding the state's legitimacy practices: the tactics it uses to demonstrate and enact legitimacy. Legitimacy is not performed only, or even most often, for the general public: instead these practices are largely enacted *within* the government. Barker argues that the "internal practices of government and politics [...] provide a more steady articulation of those elite legitimations which are a part, not of the occasional but of the everyday conduct of government," (Barker, 1990, p. 157). Unlike appeals to the public which arise under exceptional challenges to legitimacy, the *everyday* practice of legitimacy is a project largely performed by and for the state. However, this performance has larger implications for how the state exercises its authority.

Negotiating the Legitimacy of the Administrative State

We focus in particular on the U.S. administrative state's pursuit of legitimacy as a crucial site where legitimacy is negotiated through everyday practices. While in the U.S. the authority of legislators is legitimated by democratic elections, agency officials—who are appointed rather than elected—must look elsewhere. The history of U.S. agency policy-making points to the intricate strategies involved in establishing the legitimacy of the administrative state, centered around two key aspects of legitimacy: the suppression of arbitrariness and the expansion of accountability (Bressman, 2003). Attempts to minimize arbitrariness have relied on establishing objectivity through appeals to rules, procedure, and expertise as well as through demonstrably consistent and fair decisions. Meanwhile, efforts to expand accountability have involved transparency, public participation, and susceptibility to consequences. At times, the legitimacy of the administrative state has been conceptualized as a trade-off with the efficiency achieved through agency experts' flexibility and

capacity to oversee complex issues (Bressman, 2003; Waldman, 2020). However, efficiency has alternatively been conceptualized as a unique affordance of the administrative state that justifies its existence and therefore plays a key role in its legitimacy (Calo and Citron, 2020; DeCanio, 2021). Examining the administrative state's legitimacy practices reveals the values for which legitimacy stands in: accountability, non-arbitrariness, and efficiency. More importantly, looking closely at these legitimacy practices can reveal how the state interprets, assesses, and operationalizes these often contested values.

Administrative Legitimacy and Quantification

We propose that agency practices around algorithms belong to a class of legitimacy practices based in *quantification*. The study of quantification – “the production and communication of numbers” (Espeland and Stevens, 2008, p. 402) – has been taken up by scholars of science and technology studies to understand how numbers are shaped and how they in turn shape the world. A core part of the quantification literature describes the adoption of quantification practices in administrative contexts, (Mennicken and Espeland, 2019) and in so doing examines the authority of numbers (Porter, 1995; Deringer, 2018; Berman, 2022). The authority of quantification aligns with the administrative state's pursuit of legitimacy through promises of efficiency, non-arbitrariness, and accountability. Quantification enables efficiency by simplifying complex policy landscapes, narrowing the language of dispute (Demortain, 2019) and enabling both the measurement of and optimization toward efficiency-based targets (Mennicken and Espeland, 2019). Moreover, quantification reflects an attempt to minimize arbitrariness through recourse to objectivity, as well as through appeals to consistency and fairness. Finally, quantification endeavors to expand accountability by producing trust, by allowing actors across contexts to raise and settle disputes, and by enabling visibility (Espeland and Vannebo, 2007; Porter, 1995; Deringer, 2018; Igo, 2007).

Importantly, quantification is not only used to pursue legitimacy: it also changes how legitimacy is enacted. The proliferation of quantification in government has redefined the boundaries of legitimacy within policy spaces by privileging quantitative demonstrations of legitimacy. In the following subsections, we outline existing work about how quantification has been used to demonstrate legitimacy in bureaucratic governments. We highlight how quantitative practices have been used to pursue efficiency, non-arbitrariness, and accountability. We also discuss how quantification has changed the way that these values are conceptualized and enacted.

Quantification and Efficiency

Quantification has long been used toward the goal of more efficient government. Theodore Porter argues that “for practical and moral reasons alike, efficient democratic government seemed to require improved methods of accounting, statistics, and other forms of quantification” (Porter, 1995, p. 152). The relationship between quantification and efficiency can operate subtly. Quantification functions as a technology of distance: by simplifying complex information into easily comparable numbers, commensuration enables dispersed surveillance and distant governance (Espeland and Stevens, 2008). This distance has been key to the efficient functioning of large-scale bureaucracies because it allows national governments to operate at scale, allowing the state to abstract away differences between individual subjects (1998), excluding the complexities of local issues in service of efficiency (Demortain, 2019).

Quantification further facilitates efficiency in administration by allowing policy-makers to measure, compare, and improve policies on the basis of their efficiency. Cost-benefit analysis and risk analysis are two forms of quantification that have flourished within U.S. agencies to demonstrate both the efficiency and legitimacy of policy decisions (Sunstein, 2002). Moreover, the close link between quantification and efficiency has transformed legitimacy practices to further emphasize efficiency over justifications of authority. For example, the administrative state has increasingly privileged efficiency-based analysis to demonstrate non-arbitrariness Porter (1995); Sunstein (2017) Similarly, Elizabeth Popp Berman (2022) describes the U.S. government's turn toward an economic style of thinking that privileges readily quantifiable and efficiency-based bases for legitimacy. This turn toward quantitative, efficiency-based legitimacy practices encourages economization, threatening to recast policy decisions as economic decisions and democratic goals as market goals.* Even when quantification fails to live up to its goals, these transformations are durable (Berman, 2022; Hacking, 1982).

Quantification and Non-Arbitrariness

Quantification promises to minimize arbitrariness through its suggestion of objectivity and neutrality (Espeland and Stevens, 1998; Porter, 1995). Numbers derive authority from their perceived objectivity, resistance manipulation, and clarity— making them particularly useful in the political domain (Deringer, 2018). Because numbers can be acted on in a rule-bound way, often through computerized calculation, they enable a recourse to “mechanical objectivity” which attempts to suppress the subject of knowledge through rigid rules and procedures such that anyone following the same procedures would come to the same conclusion (Daston and Galison, 2007; Porter, 1995). This vision of mechanical objectivity as evidence of non-arbitrariness aligns with attempts to constrain agency officials' discretion by legislating their behavior extensively, but arises in contrast to the attempt to establish agency officials' legitimacy by appealing to their scientific expertise (what Theodore Porter (1995) calls “disciplinary objectivity”). Consequently, quantification has reshaped the meaning of arbitrariness within U.S. agencies: mathematical modeling of risk has taken the place of expert judgment as the gold standard for evidence against arbitrary decision-making (Porter, 1995).

Throughout the quantification literature, the objectivity of numbers is demonstrated through consistency and fairness. Consistency has been particularly essential for establishing the legitimacy of social numbers, demonstrating that these numbers are impervious to distortion by the individual whims and biases of those who create them (Espeland and Stevens, 2008). Moreover, the statistical techniques at the core of quantification themselves produce consistencies, reinforcing their apparent objectivity and rendering their outputs resistant to arbitrary circumstances (Didier, 2020). Beyond consistency, quantification also promises to achieve fairness by eliminating human biases. However, as in the case of consistency, quantification itself has reconfigured what it means to be fair, encouraging quantitative demonstrations of unbiasedness (Espeland and Stevens, 2008).

*On this Andrea Mennicken and Wendy Nelson Espeland (2019) write, “[N]umericization opens up not only new ways of political engagement; it also encourages economization by moving governments and citizens closer to principles of rational calculation, efficiency, competition, and market making, which in turn can run the risk of hollowing out democratic rule.”

Quantification and Accountability

Quantification promises to promote accountability through transparency and public participation alike. Jeremy Freese and David Peterson (2018) argue that contemporary statistical practices around open data and open science—a movement that they refer to as “statistical objectivity”—reflect the view that transparency is a prerequisite to democracy. Under this paradigm, transparency enables verification, discourages incautious or dishonest practices through the threat of sanction, and allows claims to be compared and jointly assessed. Indeed, transparency has become closely associated with the production and communication of numbers that quantification enables, making visible decisions, people, objects that may previously have been hidden (Espeland and Stevens, 2008).

Beyond transparency, quantification enables stakeholders and publics to hold the state accountable by facilitating participation in political life through representation and debate. Quantification has a particularly privileged place in the U.S. government, which enshrines the collection of population statistics in its constitution and uses its national census to determine political representation. Alain Desrosières (1998) proposes that the U.S. government’s orientation toward numbers reflects a uniquely American conception of democracy that is “based more on debate and the quest for compromise than on an affirmation of general public interest and single truth” (p. 192). Indeed, William Deringer (2018) conceptualizes calculations as instruments of dispute, tools of argumentation and persuasion that have historically not only allowed those in power to exercise their authority, but have also allowed outsiders to critique those in power. Consequently, quantification promises to create an avenue toward accountability by facilitating participation in democratic debate and providing a common language for critique. Perhaps because of its promises of transparency and participation, accountability has increasingly been operationalized quantitatively in legal settings (Espeland and Vannebo, 2007).

Study Setting: Legitimacy Practices of the U.S. Government Accountability Office

The U.S. Government Accountability Office (GAO) acts squarely in the context of everyday state legitimacy practices. GAO is an independent agency in the legislative branch that provides oversight over the federal government, including administrative agencies in the executive branch, on behalf of Congress. Emphasizing nonpartisan information gathering and the accountability of the administrative state, the GAO attempts to preserve administrative legitimacy through its day-to-day operations (U.S. Government Accountability Office, 2024b).

Through their oversight of agency use of algorithms, GAO implicitly intervenes on where and how it is legitimate for algorithms to take on administrative roles. As we introduce in Methods, below, we will use a corpus of reports published by GAO to examine everyday legitimacy practices and how they are shaped by, and shape, the algorithmic turn in the administrative state.

Vignette: GAO Activity Echoes Political Attention and Politicization of Government Activity

The GAO aims to enact accountability, specifically as a “a source of objective, non-partisan information on government operations. GAO plays a key role in helping Congress improve

the performance of government, ensuring transparency and saving money.” (U.S. Government Accountability Office, 2024b).[†]

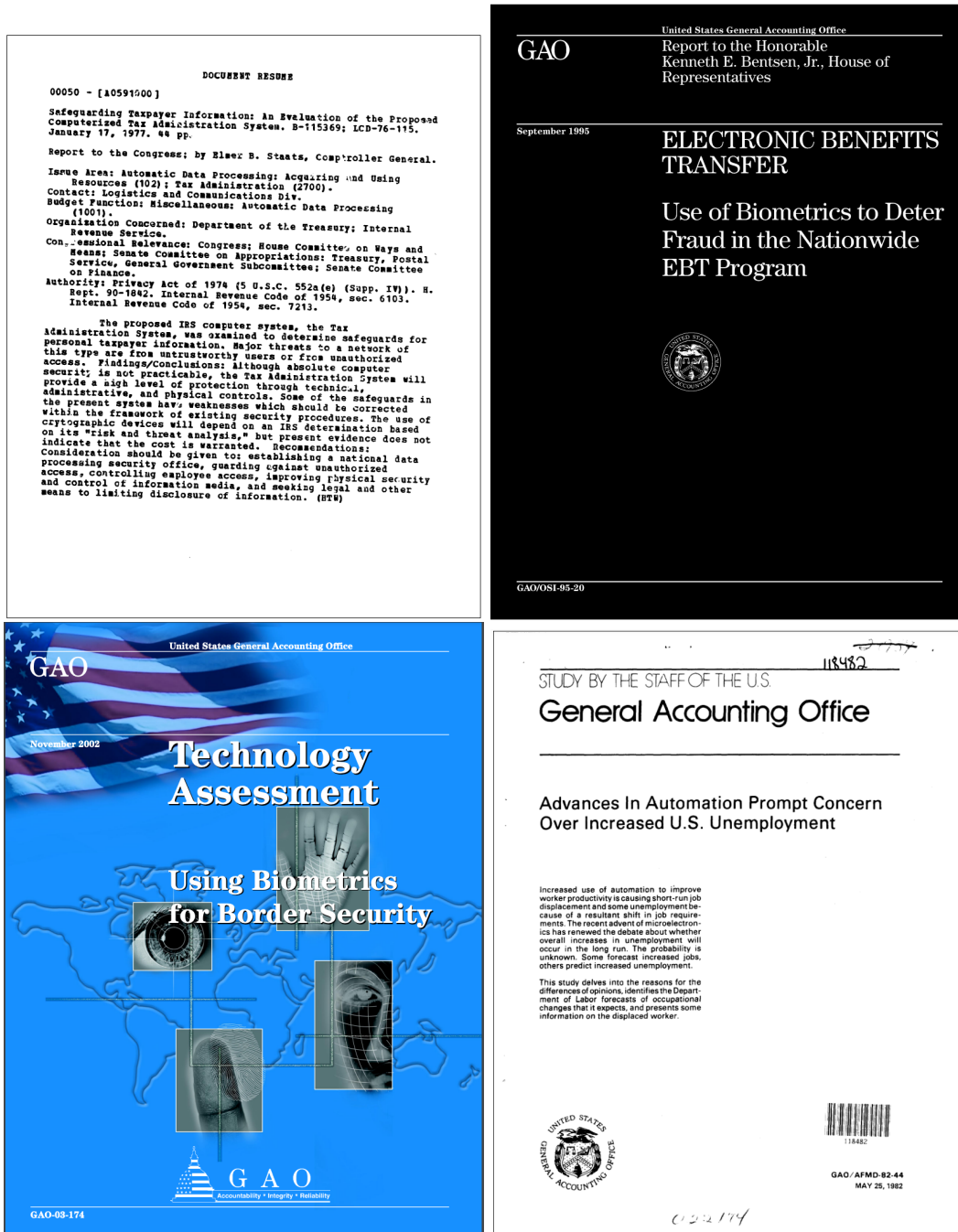


Figure 1. Examples of GAO reports from clockwise from top-left: Safeguarding Taxpayer Information: An Evaluation Of The Proposed Computerized Tax Administration System (1977); Electronic Benefits Transfer: Use of Biometrics to Deter Fraud in the Nationwide EBT Program (1995); Advances In Automation Prompt Concern Over Increased U.S. Unemployment (1982); Technology Assessment: Using Biometrics for Border Security (2002).

[†]See citation for most recently available date that this content was online.

One key mechanism that GAO uses to pursue this mission is the publication of reports, either initiated externally by Congress or existing laws, or internally via the Comptroller General. GAO is only one of several oversight tools available to help Congress pursue its political goals: rather than requesting a GAO report or audit, Congress might instead initiate a committee hearing. Historically, Congress has leaned on GAO reports more heavily in times of unified government to advance shared policy goals, rather than to undermine the executive branch (Kennedy, 2023).

These reports ultimately reflect areas of political attention, including specific ways that government functions become politicized (Figure 1). This is a known tension. However, political scientists' treatment of administrative law as a locus of political acts has largely developed separately from legal scholarship about administrative legitimacy exercises (Bressman, 2007).

In the following (cherry-picked) examples, one can observe emerging reports on aviation security in the years following 9/11, or the adoption of Web or electronic services in response to the E-Government Act of 2002.

- 1977: Safeguarding Taxpayer Information: An Evaluation Of The Proposed Computerized Tax Administration System. LCD-76-115 1
- 1982: Advances In Automation Prompt Concern Over Increased U.S. Unemployment. AFMD-82-44 1
- 1982: Industrial Policy: Japan's Flexible Approach. ID-82-32 1
- 1989: Computer Security: Virus Highlights Need For Improved Internet Management. IMTEC-89-57 1
- 1995: Electronic Benefits Transfer: Use of Biometrics to Deter Fraud in the Nationwide EBT Program.
- 1998: Year 2000 Computing Crisis: Progress Made In Compliance Of VA Systems, But Concerns Remain. AIMD-98-237 1
- 2002: National Preparedness: Technologies To Secure Federal Buildings. GAO-02-687T 1
- 2002: Technology Assessment: Using Biometrics for Border Security. GAO-03-174 1
- 2007: Budget Issues: FEMA Needs Adequate Data, Plans, and Systems to Effectively Manage Resources for Day-to-Day Operations. GAO-07-139 1
- 2018: Unemployment Insurance: Actions Needed To Ensure Consistent Reporting Of Overpayments And Claimants' Compliance With Work Search Requirements. GAO-18-486
- 2018: Supplemental Nutrition Assistance Program: Disseminating Information on Successful Use of Data Analytics Could Help States Manage Fraud Risks. GAO-19-115

These reports of nonpartisan information about transparent, functional, and effective government cover a wide range of issues including national and international concerns about security, commercial preparedness, and access to welfare benefits. Yet in context, they also reveal anxieties, politicized (and weaponized) topics, and reactions to significant political and social events of their time. Despite its goals of nonpartisan evaluation, GAO is unavoidably shaped by its political context. This tension serves as an important reminder that legitimacy practices do not originate from some objective ideal of political authority, but are imbued with mutable political values. Similarly, we should expect that how GAO manages agency use of algorithms will reflect broader normative priorities and political context.

Accounting and Accountability in the GAO

Initially called the General Accounting Office, GAO was established in 1921 under the Budget and Accounting Act to audit government agencies and expenditures (U.S. Government Accountability Office, 2024a). In its early years, GAO primarily employed accounting and audit clerks to process and review financial transactions (Walker, 2005). Over time, these duties evolved to include more general oversight duties, including program evaluation, policy analysis, and science and technology assessments. This broader ambit led GAO to hire a wider range of science, policy, and technology experts and to change their name to reflect their more expansive goals. This change can be seen in the updated seal for the GAO in Figure 2 (image credit: Wikimedia, 2024b,a). However, the early accounting history of GAO continues to shape its current emphasis on *efficient* government spending.

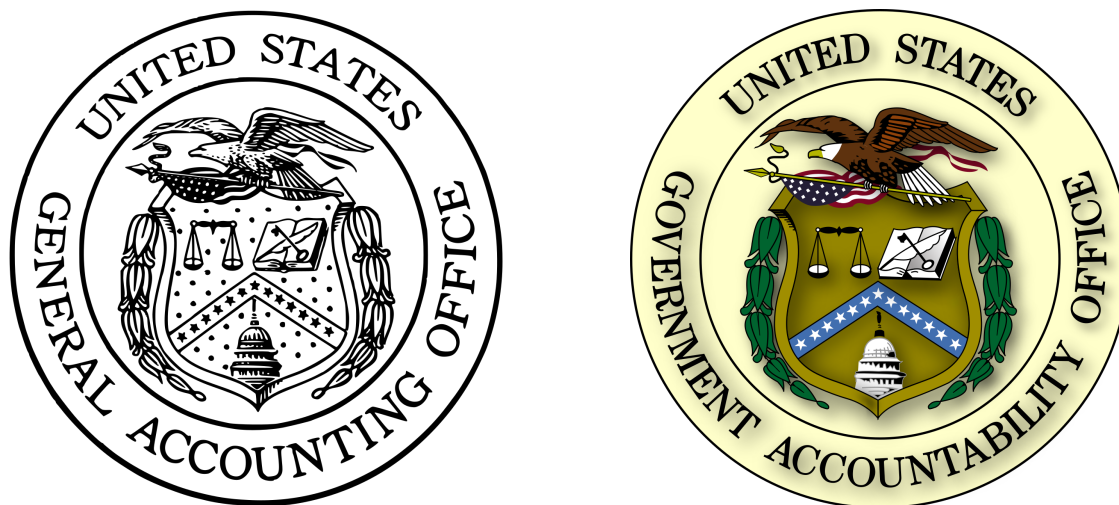


Figure 2. GAO changed its name from the General Accounting Office to the Government Accountability Office in 2004 to reflect a broader range of oversight responsibilities. Left, the seal for the U.S. General Accounting Office; right, the U.S. Government Accountability Office Seal.^{??}

Indeed there is a long history of accounting practices being used toward legitimacy because of their reliance on quantitative, rule-bound procedures (Porter, 1992). A large part of GAO's work follows the accounting tradition of auditing. In the context of audits, legitimacy is co-produced by the auditor and auditee (Power, 2003). GAO's continued legitimacy depends on its credibility, which it has established largely by focusing on quantifiable, seemingly objective metrics, in particular financial analyses (Mosher, 1979). Simultaneously, GAO reports establish the legitimacy of agency activities, including where and how they turn to algorithms. GAO enacts legitimacy quantitatively through its accounting practices, simultaneously verifying agencies quantitative outputs (via audits) and producing their own numbers (through measurement, analysis, and evaluation). Drawing on the history of quantification, this article examines how legitimacy is negotiated around algorithms. GAO's connection to accounting for accountability makes for a compelling empirical case, allowing us to examine how algorithms have both maintained and transformed the close coupling between quantification and legitimacy in the administrative state's history.

Methods

Data

Our analysis draws from a corpus of reports published by the U.S. Government Accountability Office since its inception in 1921. GAO reports can be initiated in one of three ways: by a legal mandate, through congressional request, or at the discretion of the Comptroller General, who leads the GAO. Most commonly, reports are created in response to a congressional request.

We first included all reports that included the term “algorithm” and/or the term “artificial intelligence.” There were 953 reports that met these inclusion criteria, the earliest of which was published in 1968 (Figure 3). We randomly sampled 10 reports from each presidential administration in our corpus, except for administrations where fewer than 10 reports were published for which we included all reports (Table 1). This left us with a total of 90 reports, ranging in length from 11 to 888 pages. We performed qualitative coding on these 90 reports following the approach outlined in the following subsection.

Table 1. Number of reports included in final analysis by presidential administration. We randomly sampled 10 reports per presidential administration in our original corpus, except for the Johnson, Nixon, and Ford administrations in which fewer than 10 reports were published. For these administrations we included all available reports.

Administration	Number of Reports in Analysis
Johnson	1
Nixon	1
Ford	8
Carter	10
Reagan	10
George H.W. Bush	10
Clinton	10
George W. Bush	10
Obama	10
Trump	10
Biden	10

Empirical Strategy

We treat the GAO reports in our sample as *discourse materials* that both reflect and shape how legitimacy is and has been understood (see generally Clarke et al. (2017) on the analysis of discourse materials). To analyze these reports, we draw on abductive analysis (Timmermans and Tavory, 2022; Tavory and Timmermans, 2014) to identify themes around how GAO enacts legitimacy around algorithmic technology. By beginning from existing theories and looking for deviations from these theories, abductive analysis is designed to generate surprises and support the development of theory. We begin from Bressman’s (2003) account of administrative legitimacy and the history of quantification and legitimacy. We also contextualize our findings within the emerging algorithmic legitimacy literature, highlighting continuities and divergences from this literature.

We employed thematic line-by-line coding of each GAO report in our sample along the following dimensions:

1. DOMAIN: Where does the government turn to algorithms? Where does GAO conceptualize algorithmic intervention as legitimate or illegitimate?

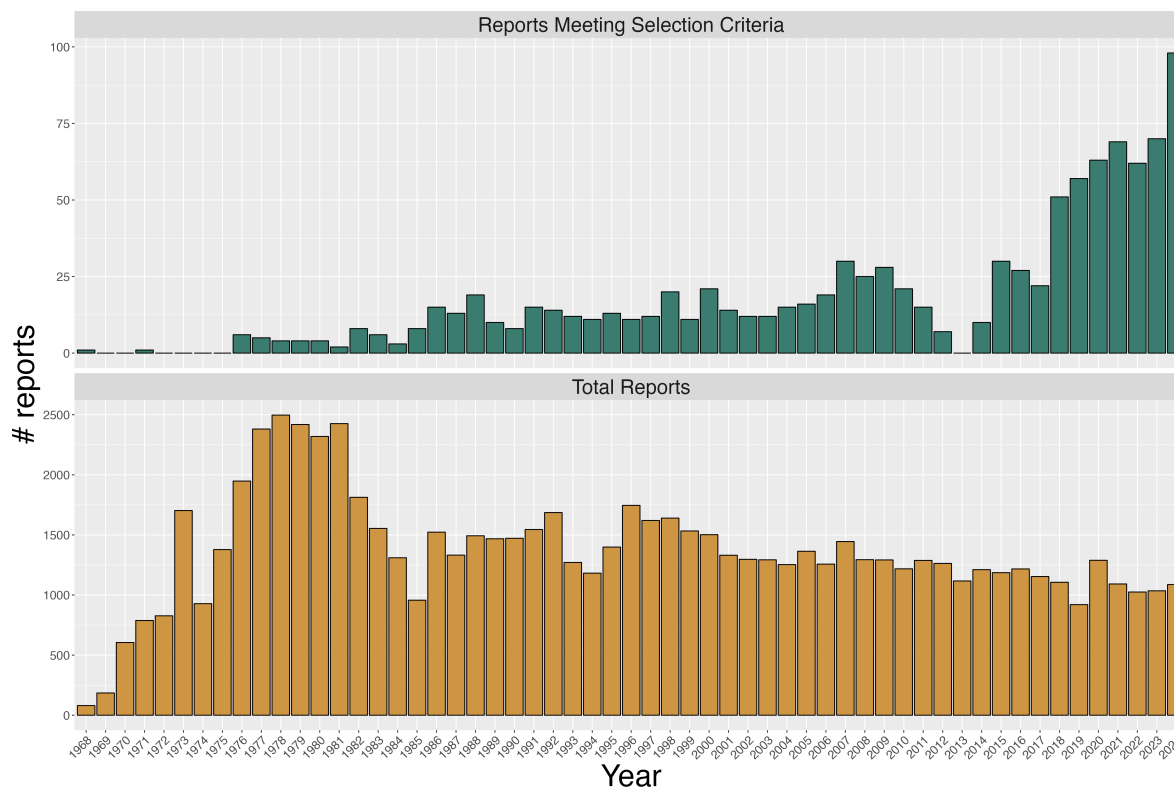


Figure 3. GAO reports 1968-2024. Top: Histogram of the number of GAO reports including the terms “algorithm” and/or “artificial intelligence” per year (Note: our data collection stopped March 18, 2024 but this table includes all reports through the end of 2024). Bottom: Histogram of all GAO reports during the same period for comparison.

2. PROMISES: How does GAO justify the turn to algorithms? How is this transforming conceptions of legitimacy?
3. CHALLENGES: Where does GAO conceptualize the risks and challenges of algorithms? How does this align with notions of legitimacy?
4. INTERVENTION: What steps does GAO propose to address the challenges outlined above? How are these interventions designed to ensure or demonstrate the legitimacy of algorithmic systems?

Applying this coding scheme, we might for instance find in a report “health care” as a domain, “speed” and “accuracy” as promises, “opacity” and “data privacy” as challenges, and “oversight” as a proposed intervention. Once we applied this coding scheme, we grouped related codes together and identified major themes. Specifically, we examine promises, challenges, and interventions through the lens of legitimacy, grouping codes under the major themes of accountability, efficiency, and non-arbitrariness – historical pillars of administrative legitimacy and quantification, which we find are also central to how GAO conceptualizes legitimate agency use of algorithms. Drawing on the history of administrative legitimacy, our analysis allows us to identify where algorithms extend, but also transform agency legitimacy practices vis-a-vis these three central dimensions.

Analysis

We analyzed how GAO reports between 1968 and 2024 have discussed agency use of algorithmic technologies and artificial intelligence. Through this analysis, we found that the majority of agency uses of these technologies were adopted for internal management purposes—such as cybersecurity, billing, or agency workforce management—rather than for public-facing policy implementation. These findings match a 2023 GAO report showing that, except for “science,” internal management was the most common agency use case of AI (U.S. Government Accountability Office, 2023).

Through our coding of the promises and challenges of algorithmic technology—and interventions designed to address these challenges—we find that efficiency, non-arbitrariness, and accountability are still key values used to demonstrate legitimacy. However, we find that efficiency and non-arbitrariness are more central than accountability in establishing the legitimacy of algorithms.

In the following sections, we examine how these core values are operationalized, emphasizing continuities and shifts with prior forms of quantification and the history of administrative legitimacy more broadly. To structure our findings, we draw on Bressman’s (2003) account of legitimacy, which we divide into three dimensions: efficiency, non-arbitrariness, and accountability. For each dimension we first introduce where the literature on government algorithms has engaged with this topic, share our findings, and connect them to the larger tradition of quantification and legitimacy.

Limitations

We acknowledge some basic limitations to our empirical strategy. First, our analysis is necessarily limited by its U.S.-centric approach, and within that context, GAO is only one aspect of how legitimacy is operationalized. We could instead consider other empirical sites for understanding legitimacy in the administrative state, such as through the OMB, NIST, or previous Executive Orders (several of which have been rescinded and reinstated under adjusted terms since March-April 2025); a deep dive into GAO’s framework, *Artificial Intelligence: An Accountability Framework for Federal Agencies and Other Entities* (2021), could be a project in and of itself. Choices comprising our empirical strategy, including case studies, qualitative coding, limited sample (random subsample of identified corpus), and a non-representative sample due to choice of corpus (reports with “algorithm” or “artificial intelligence”), all limit our potential findings. Additional text-based methods including larger-scale computational analysis could additionally be used to expand this analysis.

Efficiency in the Algorithmic Turn

A hallmark of the algorithmic turn in the administrative state is the pursuit of efficiency: algorithms promise to reduce the time and cost while preserving function. This has been core to the uptake of algorithmic decision-making in government use. Ari Waldman suggests that algorithmic decision-making systems’ orientation toward agility, frictionlessness, and cost-reduction make them a natural ally of the U.S. government (Waldman, 2020)—a government that increasingly prioritizes efficiency over other social and political values (Berman, 2022). By reducing the need for human deliberation, automated decision-making systems promise to save money by reducing labor costs, and to save time by shortening the decision-making process, freeing up human decision-makers to

apply their efforts to other tasks, and ultimately reducing backlog at over-burdened federal agencies (Engstrom et al., 2020).

Although efficiency describes a trade-off between function and cost (see e.g. Coleman, 2015), efficiency gains from algorithms often center costs and overlook function. The Social Security Administration, for example, reported that an algorithmic system they implemented to assign cases to adjudicators resulted in a 7% increase in “productivity” during its pilot run, while their Quick Disability Determination algorithm reduced processing times and the costs of in-person hearings (Engstrom and Ho, 2020).

When function is considered, efficiency gains are often unrealized and algorithmic systems end up costing rather than the U.S. government money, not only due to the cost of development or procurement, but also as a result of persistent errors (Calo and Citron, 2020). Moreover, even where efficiency gains are realized, prioritizing efficiency over other values risks undermining the administrative state’s pursuit of legitimacy, particularly where the adoption of algorithmic systems implicates human rights (Waldman, 2020).

Synthesizing across the algorithmic legitimacy literature, we can see that, similarly to other forms of quantification, the rhetoric around algorithms tends toward economic notions of efficiency—often at the expense of other values. We find echoes of these literatures in how the GAO operationalizes efficiency, as outlined in the remainder of this section.

The Promise of Algorithms and the Many Meanings of Efficiency

The rhetoric of efficiency is often used to justify the adoption of algorithmic systems within agencies. However, a closer look at this rhetoric reveals the malleability of efficiency: the many ways it can be evaluated, and the many values that it stands in for.

Efficiency as economic We find that the GAO calls upon efficiency operationalized in economic terms. GAO presents efficiency as a key promise of algorithmic adoption within agencies. The reports primarily conceptualize efficiency in terms of economic optimality, as demonstrated in the quotes below, which discuss efficient allocation, revenue generation, cost reduction, and enhanced worker productivity.

“The Redistribution and Disposal System (RADS) is a computerized mathematical model designed to serve as a management tool for decisions concerning the reallocation of overstocked items to other GSA [U.S. General Services Administration] depots or to disposal. The heart of the system is an algorithm that determines the **economically optimum** set of allocations throughout the GSA system for all the stock of each item being analyzed.” – *Federal Information Sources & Systems*, 1976

“Compliance programs will **generate revenue** by using market segment analysis to select the **most productive cases** and by providing frontline enforcement personnel with immediate access to taxpayer data files and automated tools to perform both complex calculations and routine clerical tasks **more quickly and accurately**. This will result in **lower costs to both the taxpayer and the Service**.” – *Financial Audit: Examination Of IRS’ Fiscal Year 1994*, 1995

Efficiency as number We also find that GAO operationalizes efficiency in quantitative terms in their justifications of the promise of algorithms. This emphasis on economic measures of efficiency is in line with the way that quantification has been used to legitimate the administrative state. We find continuity in the way that efficiency is operationalized: algorithms promise to further extend the legacy of earlier quantification by continuing to enable the assessment and optimization toward economic goals. In the example below, we see that these efficiency outcomes are often cast as quantifiable measurements.

“ACI [the Automated Criminal Investigation System] will permit Criminal Investigation employees to **more efficiently** and effectively complete investigations, using information obtained from sources throughout the law enforcement community. It is projected that the automation of work practices through ACI will **increase employee productivity by as much as 20%.**” – *Financial Audit: Examination Of IRS’ Fiscal Year 1994, 1995*

Efficiency as functionality Crucially, we find that efficiency alone is not necessarily sufficient to legitimate the adoption of algorithmic systems within agencies. The literature has cautioned that efficiency-based legitimation strategies often emphasize cost reduction at the expense of function. We observe, however, that while GAO emphasizes the promise of reducing costs, they simultaneously emphasize enhanced performance, pointing to the effectiveness and accuracy of these new systems. In the following example, GAO highlights cost-reduction and efficiency improvements alongside improvements in fairness and performance. Through this and the previous examples, we note that promises of efficiency are often coupled with promises of improved functionality. (Non-arbitrariness, which we discuss next, also underlies functionality.) Here, we see efficiency not just for efficiency’s sake, but explicitly paired with functionality:

“Being able to predict taxpayer behavior using statistical models helps improve the likelihood of a **desired outcome** by matching the outreach to a given taxpayer’s characteristics. The IRS is better able to **efficiently use limited resources to accomplish tax administration goals** such as fairness, reducing taxpayer burden, revenue collection, and ensuring compliance through the judicious use of these data analytic techniques.” – *Financial Audit: IRS’s FY 2019 & FY 2018 Financial Statements, 2019*

Efficiency as necessity While efficiency may not be sufficient, GAO sometimes presents the efficiency of algorithmic systems as necessary due to the size or the complexity of agency problems. In these circumstances, GAO relies on efficiency alone to establish the legitimacy of adopting algorithmic technologies:

“Computer system support is **essential** to collect, analyze, and transmit the **vast array** of information used to plan and manage a service’s enlisted force.” – “*Spaces,*” “*Faces,*” and “*Bucks*”: *An Overview of the Role of Automated Information Systems in Managing the Enlisted Force, 2010*

“IRS converted to automated data processing (ADP) because statistics showed that the Service’s workload was increasing **beyond the capacity** of conventional manual and

machine processing capabilities.” –*Safeguarding Taxpayer Information: An Evaluation Of The Proposed Computerized Tax Administration System, 1977*

As with quantification, enhanced efficiency is a central promise of algorithmic adoption. Often these proposed efficiency gains account for cost and speed as well as functionality. However, where algorithms are framed as necessary to meet the demands of increased scale and speed, efficiency risks crowding out other legitimacy considerations. This risks exacerbating concerns in the quantification literature about the displacement of non-efficiency values as legitimacy is increasingly demonstrated through efficiency.

The Economic Cost of Algorithms

GAO also engages with efficiency in how they conceptualize risks of algorithms. Notably we observe that the promise of greater efficiency is uncertain. In some cases, GAO notes that algorithmic systems, particularly when they are adopted without sufficient care, can in fact undermine efficiency.

“All too often, the lure of the electronic office has led agencies to launch **expensive automation programs** without adequately defining what characteristics the automated system should have, which alternative approaches for achieving automation are most efficient and effective, or even how best to use computer and telecommunications equipment once it is acquired.” –*The GAO Journal, No. 1, Spring 1988, 1988*

When presented as a challenge, efficiency continues to be conceptualized in economic terms. Our findings indicate that, while efficiency is conceptualized in similar ways under the algorithmic regime and the pre-algorithmic quantification regime, there is less certainty about the result of algorithmic technology. Although economic efficiency remains an essential tenet of legitimacy, algorithms promise to further efficiency just as they threaten to undermine it.

Everyday Efficiency Practices

We find that GAO relies on non-algorithmic forms of quantification to establish the legitimacy of new forms of algorithmic administration. To mitigate the efficiency risks brought on by the uncertainty associated with algorithms, GAO turns to more established forms of quantification, like cost-benefit analysis or quantitative risk analysis, as demonstrated by the following examples.

“A **detailed cost-benefit analysis** must be conducted to determine that the benefits gained from a system outweigh the costs.” –*Aviation Security: Challenges in Using Biometric Technologies, 2004*

By combining the adoption of algorithms with more established forms of quantification, GAO attempts to reinforce algorithmic technology where uncertainty around its efficiency threatens to undermine administrative legitimacy. This reflects continuity in conceptions of efficiency and legitimacy between algorithmic and non-algorithmic forms of quantification. However, algorithmic technologies are not associated with the same level of legitimacy as other forms of quantification like cost-benefit analysis, which has been institutionalized within administrative legitimacy practices.

Non-Arbitrariness in the Algorithmic Turn

The administrative state's efforts to establish its own legitimacy have long appealed to their own objectivity and non-arbitrariness, including quantification as an instrument for objectivity. However, the critical literature stresses that—just as any decision-making system—algorithms are never neutral. Rather, algorithms require policy choices around “what data sets to use to train the algorithm, to how to define what the algorithm's target output is, to how likely the algorithm is to produce false positives versus false negatives” (Kaminski, 2020, p. 122). That is, algorithmic technology can not and can never achieve objectivity, although their proposed benefits include reduced bias, increased accuracy, and increased consistency (Engstrom et al., 2020; Kleinberg et al., 2018, e.g.). The purported benefits of algorithmic systems—fairness, accuracy, and consistency—can be seen as evidence of reasoned and non-arbitrary decision-making.

Yet, researchers have highlighted persistent bias in algorithmic decision-making systems (Barocas and Selbst, 2016; Eubanks, 2018, e.g.). This bias undermines algorithmic systems' promises of objective and reasoned decision-making. Moreover, claims to reasoned decision-making are further weakened by functionality issues, including engineering failures, unanticipated post-deployment failures, and overstated capabilities (Raji et al., 2022). These functionality issues result in high error rates and—particularly in the case of algorithms attempting to solve impossible tasks—unreasoned decision-making. Even when algorithmic systems are highly accurate, arbitrariness remains an issue when the inner workings of systems are opaque or unexplainable. As Emily Berman explains: “To lack arbitrariness, the government must have some justification for the exercise of its power, and that exercise of power must have some connection to the proffered explanation” (Berman, 2018). However, both of these imperatives of reasoned decision-making are thwarted when administrative algorithms lack transparency and explainability.

The Promise of Non-Arbitrariness

Non-Arbitrariness as consistency As with other forms of quantification, algorithms demonstrate non-arbitrariness through appeals to consistency.

“For example, several models are used primarily for forecasting a single crop, a series of crops, or an entire agriculture sector over a period of time. Used to assess probabilities of future outcomes, such models can provide policymakers with **systematic** speculations about the future.” —*Food And Agriculture Models For Policy Analysis*, 1977

Non-Arbitrariness as objectivity We find that the non-arbitrariness afforded by algorithms is positioned in contrast with expert judgment. In the following example, GAO takes issue with a system referred to as a the “ground officer algorithm” for its misleading name. Unlike mathematical or computerized algorithms, which GAO claims are “consistent,” the ground officer algorithm relies primarily on human judgment, which they imply does not entail the same protections against arbitrary decisions.

“[Ground officer positions] are not based on measured work load but on what the Navy refers to as a **ground officer “algorithm.”** While this term suggests a **systematic mathematical approach** to developing requirements, as used here it represents a list of positions the Navy believes are required, **based largely on corporate management**

judgment.” –*Navy Manpower: Squadron Manpower Program Needs Improvement*, 1987

Specifically, we see that quantitative demonstrations of non-arbitrariness are privileged over judgment. In the same example, we observe that quantitative information takes the place of, and makes obsolete, other forms of justification.

“A 1981 [Chief of Naval Operations]-contracted study of the Navy’s development of officer requirements criticized the Navy’s methodology, stating that the ‘methodology used is **not sufficiently quantitative in nature** to provide **adequate justification** for the ground officer requirements.’” –*Navy Manpower: Squadron Manpower Program Needs Improvement*, 1987

The adoption of algorithms extends quantification’s turn toward mechanical objectivity as a way to enact non-arbitrariness, further marginalizing the role of agency expertise in demonstrations of administrative legitimacy.

The Risk of Inaccuracy

We find that where the arbitrariness of algorithmic systems is in question, demonstrations of non-arbitrariness are based in accuracy or predictive validity rather than reason-giving. The possibility of errors threaten to undermine the legitimacy of algorithmic systems. In the following quote, conceptualizes non-arbitrariness in terms of predictive validity, noting that the functionality of these systems can be ascertained *only* through accurate prediction.

“Although simulations are useful tools, they rely on data that may be incomplete and **assumptions that may be inaccurate**. Constructing an accurate simulation requires that the behavior of what is being simulated be well understood; there is a great danger in accepting the results of computer simulations as representing reality, rather than using them as design tools. **The accuracy of a simulation can only be checked by comparisons with measured results in the real world, a process called ‘validation.’**”
–*Strategic Defense Initiative: Estimates Of Brilliant Pebbles’ Effectiveness Are Based On Many Unproven Assumptions*, 1992

The algorithmic turn creates a new emphasis on predictive validity and accuracy metrics. This is distinct from other quantitative demonstrations of non-arbitrariness like cost-benefit analysis. Cost-benefit analysis leaves room for agencies to engage in interpretation and judgment through deciding how to assign value, an inherently ambiguous task. There are ambiguities in designing algorithms as well, particularly in deciding how to operationalize and encode policy goals. However, these act of interpretation become detached from assessments of legitimacy when evaluation becomes about assessing accuracy, a task which assumes away ambiguities in favor of a simple binary between correct and incorrect.

Everyday Non-Arbitrariness Practices

We observe across these reports that interventions to identify algorithmic errors emphasize human assessment. In our earliest report, written in 1968 and quoted below, GAO privileges human judgement above algorithmic outputs.

“Finally systems analysis, is **not a substitute for the decisionmaker’s judgement**. It is an aid—a tool—that can be used by the decisionmaker to sharpen his judgment.” –*Glossary for Systems Analysis*, 1968

This orientation toward human judgment as an intervention for the arbitrariness of machines continued for decades. For example, describing the limitations of an algorithmic driving simulation tool, a 1992 GAO report reads:

“(1) the motion envelope for any simulator will impose inherent limitations on some applications because **there is no analytical, scientific, or engineering way to define the required motion envelope for any given application** and (2) the size of the motion envelope will still **rely on simulation experts’ best guess**, even after washout algorithms have been used.” – *Motor Vehicle Safety: Key Issues Confronting The National Advanced Driving Simulator*, 1992

This analysis positions the algorithmic system as inherently limited because of its inability to work across all contexts. Human expertise is positioned as a solution to the problem of inherent uncertainty or ambiguity. Expert judgment is incorporated as an integral part of the overall system.

However, in more recent reports, we observe human judgment has been reduced to the role of review after an algorithm has already made a determination. In this case, judgment is only used to assess whether an algorithm is “correct,” while broader conceptual ambiguity is unacknowledged. We can see this dynamic in the following two examples.

“[W]e used **professional judgment** to determine whether cases with typos were sufficiently similar to consider as matches” – *2014 Lobbying Disclosure: Observations On Lobbyists’ Compliance With Disclosure Requirements*, 2015

“The first step in the **manual review process** is a triage review, which is intended to identify loans of less than \$2 million that can be easily resolved by determining that an automated screening alert was **invalid**, according to loan review contractor officials.” – *Paycheck Protection Program: SBA Added Program Safeguards, but Additional Actions Are Needed*, 2021

In both of these cases, human judgment is brought in to rectify algorithmic oversights in situations where there is an assumed “correct” answer, rather to provide a more nuanced assessment (note for instance, the change from “expert” judgment in 1992 to “professional” judgment in 2015). Thus, even in situations where human intervention is proposed to legitimate algorithms, the expert status of agency officials is minimized in light of a more rote, objective set of duties vis-à-vis algorithmic oversight. As a result, the role of judgment is diminished under an emerging set of legitimacy practices that conflate non-arbitrariness with accuracy.

Accountability in the Algorithmic Turn

In the context of algorithms in government, the algorithmic accountability literature has centered *transparency* and *explainability* as key interventions on how automated decision-making systems *displace* responsibility. Some research argues that algorithmic systems enable sufficient transparency (Coglianese and Lehr, 2019), or even improve it (Kleinberg et al., 2018; Levy et al., 2021), through explicit problem formulation and explanation of design choices. Elsewhere, however, critiques of algorithmic systems have raised concerns that the inscrutability of complex technical systems poses a threat to transparency, explainability, and, as a result, on the ability of non-technical stakeholders and experts to meaningfully participate in accountability processes. In response to these concerns, a significant portion of the literature on the use of algorithms in government has focused on how these systems can be made more accountable. These solutions tend to focus on either transparency and explainability or on expert and public participation.

Calls for transparency take many forms, targeting both technologies and the systems around them (Kaminski, 2020). For example, Danielle Citron (2007) proposes that the code underlying administrative algorithmic systems should be made public to reveal how these systems work and expose the policy choices embedded within them. Similarly, Madalina Busuioc (2021) argues that algorithmic systems used in government should be made transparent through open code, but claims that transparency alone is insufficient for true accountability if these systems are not also interpretable and explainable. In contrast to Citron, Joshua Kroll et al. (2017) argue that transparency of code, inputs, and outputs is often insufficient to verify system properties and can create harm by exposing trade secrets, undermining privacy, and creating opportunities to game algorithmic processes. In place of traditional transparency, they advocate for a suite of technical tools that allow systems to publish commitments describing what they will do and subsequently certify their fidelity to these commitments. Deirdre Mulligan and Kenneth Bamberger (2018) focus on yet another aspect of transparency: *political visibility*—transparency about the political and value-laden nature of design choices within algorithmic systems. Without political visibility, Mulligan and Bamberger (2018) argue that the public may be less likely to hold the government accountable because they do not perceive algorithmic decisions to be governance at all.

Building on transparency as a prerequisite for external participation, Danielle Citron (2007) calls for public and expert participation target accountability via the relationship between the actor (in this case, agencies and the algorithmic system they deploy) and the forum to whom they are accountable (those who are affected by or might pass judgment on the system). Kristen Vaccaro et al. (2019) propose contestation as a means of democratic participation, but highlight the challenges of designing for contestability in the face of opaque algorithmic systems. Following a different approach to participation, Jacob Metcalf et al. (2021) propose that consensus-building among expert communities, including impacted groups, is necessary to define and evaluate the impacts of algorithmic systems in service of meaningful accountability. Ifeoma Ajunwa (2023) suggests that external engagement and contestation provide necessary accountability safeguards in order to move the implementation of algorithmic technologies toward compliance with the spirit of pre-existing U.S. law. She argues that the appropriate implementation of algorithmic technology in government would include input from experts, input from stakeholders and publics, and congressional oversight, describing these strategies as demonstrating both “human-in-the-loop” and “society-in-the-loop” principles. This aligns with empirical findings that the *perceived* legitimacy of algorithmic decisions is amplified by human governance mechanisms (2022).

However, Ben Green (2022) cautions that human oversight provides a false sense of security, but often fails to address the harms of algorithmic decision-making and risks displacing accountability from institutional decision-makers to individual system operators. Green instead proposes an institutional approach to oversight that relies on affirmative justification for the integration of algorithmic systems and subsequent democratic review. This proposal aligns with what Frank Pasquale (2019) calls the “second wave” of algorithmic accountability which—rather than exclusively seeking to improve algorithms, for example through enhanced transparency—takes a more structural approach, interrogating whether, in certain contexts, it is inappropriate to use algorithms at all.

The Well-Known Challenges of Algorithmic Accountability

We find that accountability is not called upon to legitimate the adoption of algorithmic technology to the same extent as efficiency and non-arbitrariness. As the literature highlights, algorithms can make accountability more challenging because of its opacity, complexity, and displacement of responsibility. Similarly, GAO reports primarily highlight accountability as a challenge imposed by algorithmic technologies, rather than a benefit of their adoption. The following examples demonstrate the challenges of oversight due to both opacity and inherent technical limitations.

“This **lack of transparency** limits the ability of auditors and others to detect error or misuse and ensure equitable treatment of people affected by AI systems.” – *Artificial Intelligence: An Accountability Framework for Federal Agencies & Other Entities*, 2021

“Although some scientists and engineers believe that the needed [algorithms and software] for this purpose will be available in the near future, others believe that the software required is unattainable and that **such a system cannot be trusted because it can never be adequately tested**” – *Strategic Defense Initiative Program: Better Management Direction And Controls Needed*, 1987

Perhaps because of these challenges, we find that accountability is not central to GAO’s performance of legitimacy around algorithms.

Everyday Accountability Practices

Where accountability measures are brought in to address the legitimacy of algorithms, we note an emphasis on documentation. This emphasis aligns with the algorithmic accountability literature’s embrace of transparency artifacts.

“**Documentation of information systems** is critically important for solving other information systems problems. For example, systems cannot be integrated or personnel trained if it is not clear exactly what a specific system does and how it can be operated.” – “*Spaces,*” “*Faces,*” and “*Bucks*”: *An Overview of the Role of Automated Information Systems in Managing the Enlisted Force*, 2010

“Entities should **document requirements—including performance metrics**—for the AI system throughout the life cycle. Entities should **document methods to assess**

performance—which can include input-output tests, stress tests, and evaluations of model drift— to ensure AI systems meet their intended goals. Entities should **provide access to performance test results, change logs, and other documentation describing updates and key design choices, and provide a copy of the model or algorithm code to third-party assessors** of AI systems.” – *Artificial Intelligence: An Accountability Framework for Federal Agencies & Other Entities*, 2021

The turn toward documentation as a substitute for accountability can be seen as part of a larger policy shift towards traceability as accountability (Kroll, 2021, e.g.). We highlight this as an interesting outcome of the algorithmic turn. This new conception of accountability is a shift from traditional administrative legitimacy practices that have centered presidential or judicial oversight and public participation as key means to establish accountability. While documentation might in theory facilitate such oversight and participation, this link is not made explicit in the GAO reports that we analyze. Instead, “third-party assessors” are invoked in the quote above, perhaps reflecting the perceived challenges of ensuring algorithmic accountability without technical expertise. ‡

Algorithms and Ambiguity in the Future of the Administrative State

Administrative agencies have long leveraged quantification practices to address ambiguities in a purportedly efficient, non-arbitrary, and accountable way. While the role of algorithms aligns closely with this tradition of quantification, algorithms threaten to hide this ambiguity, complicating the negotiation of legitimacy and the role of the administrative state. Ambiguity in policy administration thus offers an intervention point for those seeking to strengthen, or dismantle, the administrative state.

Situating the Algorithmic Turn

Quantification has long been used to produce legitimacy and, in turn, has shifted how legitimacy is enacted. Cost-benefit analysis, for instance, has largely taken the place of agency expertise in demonstrating the legitimacy of administrative decisions. Our findings show that the algorithmic ‘turn’ is in many ways an extension of this history of quantification. Quantification’s promises of efficiency, non-arbitrariness, and accountability are similarly used to legitimate agency adoption of algorithms and artificial intelligence.

Based on these continuities, we might expect algorithms, like other forms of quantification, to be used to produce legitimacy. The majority of the uses of algorithmic systems and artificial intelligence discussed (and indeed many reported agency uses of AI (U.S. Government Accountability Office, 2023)) were adopted for internal agency management. Unlike prior forms of quantification that have been adopted to produce legitimacy in contentious, low-trust settings (Porter, 1995), our findings show that algorithms have instead been adopted for uses that are not subject to significant external scrutiny. We propose that algorithms have not yet been institutionalized as legitimation tools in U.S. public administration. This key difference—algorithms appearing in internal use rather whereas quantification historically intervening upon

‡In our coding, a lack of expertise came up repeatedly as a challenge of algorithmic adoption; correspondingly, training was called upon as an intervention to address this challenge.

low-trust settings—points to a subtle deviation in the use of algorithms. (Perhaps a subtle ‘turn’ after all.) For the administrative state, threatened legitimacy is both an upstream concern to motivate algorithms, and a downstream impact of algorithms.

The GAO reports in our sample propose interventions toward making the use of algorithmic technologies more legitimate. We note the collision of long-time legitimacy mechanisms, like cost-benefit analysis and oversight, with new mechanisms like technical validation. Through these interventions, we can understand how GAO’s enactment of legitimacy is likely to influence the future of algorithmic technology in the administrative state.

Meanwhile, by examining how GAO discusses the promise of algorithmic systems, we can anticipate how these emerging technologies might change how legitimacy is enacted. We highlight in particular that the promises of algorithmic technology are primarily conceptualized around efficiency and (claims of) non-arbitrariness. GAO is necessarily a specific case: it has uniquely navigated from a literal history of ‘accounting’ with numbers often standing in for a broader role of accountability. Yet, when it comes to algorithms, our results suggest an emphasis on appeals to efficiency and arbitrariness over accountability.

The lack of explicit attention to accountability from the GAO may be related to the fundamental barriers to accountability around algorithmic contexts. Building upon Helen Nissenbaum’s (1996) “Accountability in a Computerized Society,” A.F. Cooper and colleagues (2022) have theorized that the barriers to accountability are heightened in the algorithmic turn. How the algorithmic turn impacts administrative legitimacy will depend on how these barriers ultimately reshape everyday agency practices.

Beyond shaping legitimacy based on what is actionable, these technologies also rearrange organizational function. Quantification not only shapes what practices stand in for legitimacy, but also how they are negotiated. Algorithms do the same. Scholars and government agencies have called to attend to not just what algorithms do, but how they claim to do it. Specifically, the implicit measurement processes in quantified and algorithmic systems change where administrative decisions are made: What are these systems aiming to do? What concepts (benefits eligibility, fraud; predicted relevance; predicted needs) are operationalized, how, and by whom? (See Jacobs and Mulligan (2022) for scholarship, or, e.g., National Institute for Standards and Technologies (2023) for government guidance.) As Deirdre Mulligan and Kenneth Bamberger (2019) have argued, procurement of algorithmic technologies can swiftly displace and redefine administrative functions (and expertise, accountability, and oversight). This literature reveals that replacing one component of a sociotechnical system (for example, whether an agency official or an algorithmic system performs the task of policy administration), even when ostensibly performing the same function, can have larger political implications for the system’s values (Mulligan and Nissenbaum, 2020; Goldenfein et al., 2020; Abdu et al., 2024).

Algorithms, Institutional Practices, and the Co-Construction of Administrative Legitimacy

The institutional context of GAO, the historical turn to quantification in public administration, and the technical capabilities of algorithms all affect what is ultimately seen as a legitimate agency use of algorithms. This results in a co-constitutive relationship between administrative legitimacy and agency adoption of algorithms.

On one hand, the adoption of algorithms encourages legitimacy practices that align with the affordances of these technologies. Like earlier forms of quantification, algorithms encourage number-based, easily measured demonstrations of legitimacy, like financial cost. Algorithms also bring about new assessments of legitimacy like the use of predictive accuracy, a traditional way of evaluating algorithmic technologies, to stand in for other demonstrations of non-arbitrariness. Where algorithmic technologies don't align with traditional legitimacy practices –notably, their opacity contrasts with traditional demands for transparency, participation, expert reasoning, and accountability– these concerns are often sidelined. We note, for example, the fact that algorithms are often adopted for internal operations where agencies have significant autonomy and face little external scrutiny.

Conversely, existing legitimacy practices shape how algorithmic technologies are incorporated into agency workflows. GAO's long history as an accounting institution, for example, has shaped the way that it performs its oversight duties. Even as its mission has shifted to emphasize accountability, GAO conceptualizes accountability's primary goal as ensuring the cost efficiency of agencies.[§] Already institutionalized everyday legitimacy practices like cost-benefit analysis reflect a broader push toward administrative efficiency and dictate where agency algorithms are seen as legitimate. When algorithms are financially costly, they are seen as risky, but when they help under-resourced agencies increase productivity they are seen as necessary in spite of other risks and limitations. This accelerates an ongoing collision of corporate and administrative legitimacy that evaluates agencies using the same metrics as private companies, overlooking the government's primary goal of serving the public interest (Short, 2023). To chart a path forward, agencies must reflect on the goals of their legitimacy practices and whether algorithmic technologies move them toward these goals.

The Double-Edged Sword of Efficiency

Both existing administrative practices and the technical affordances of algorithmic technologies come together to shape how algorithms are incorporated in government. The resulting collision has meaningfully shaped how agency legitimacy is understood. Algorithmic technologies are merely one part of a growing push toward efficiency as the primary barometer of administrative legitimacy.

Despite the many meanings of efficiency, a primarily cost-based conception of efficiency has served as one of the strongest rhetorical strategies for both deregulatory activity and algorithmic adoption. Efficiency is used to demonstrate the legitimacy of agencies, which must produce evidence of their own financial efficacy. However, this perspective—which evaluates agencies not by the tasks they accomplish but by how little they cost—invites the continual underfunding of the administrative state or, more drastically, its dissolution. This efficiency imperative acts as a double-edged sword with which the administrative state can never establish its own legitimacy.

The rise and fall of the U.S. Digital Service (USDS) offers an emblematic cautionary tale. Founded in the Obama era, their mission was to “deliver better government services to the American people through technology and design,” in part by “continuously improv[ing] critical government services... Partner[ing] with federal agencies to scale digital best practices” (Digital Service, 2025). Under a vision of administration that equates best practices with cost-effective practices, the

[§]The GAO (2025) self-describes: “GAO examines how taxpayer dollars are spent and provides Congress and federal agencies with objective, non-partisan, fact-based information to help the government save money and work more efficiently.”

rebranding of the USDS towards “efficiency” under the Department of Government Efficiency (DOGE) moniker might seem like a logical next step, particularly as a move towards an “AI-first strategy” (Kelly, 2025). That is, the same tools can undo those same efforts (Chen, 2025). As Henry Farrell and Abraham Newman (2025) recently wrote, Elon Musk “is turning the U.S. government’s own strategy against itself.” Scholars and agency officials concerned with the algorithmic turn in public administration must reckon with the broader movement toward efficiency-based legitimacy practices that algorithms accelerate and entrench.

Conclusion

We contextualize the algorithmic turn in U.S. public administration within the legacy of non-algorithmic forms of quantification and broader histories of administrative legitimacy. We propose that the algorithmic turn in public administration is part of a longer legacy of quantification in government. This legacy reflects an ongoing role of ambiguity, which has long been a locus of intervention on the administrative state, and the fraught role of “efficiency” as a tool to legitimate public administration.

Specifically, we examine how GAO conceptualizes the risk and promise of agency use of algorithmic technology and what values they point to in order to establish the everyday legitimacy of incorporating algorithmic systems into administrative processes. By examining the algorithmic turn within the longer history of bureaucratic quantification, we identify where algorithms transform the values, goals, and logics of legitimacy, offering new perspectives on how legitimacy is and will be produced—and undermined.

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