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IL QUINTO PARAMETRO: NUMERO 009: Oltre l'approvvigionamento: perché l'intelligenza artificiale per la lingua dei segni è diventata un'agenda di politica pubblica

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L'intelligenza artificiale per la lingua dei segni sta diventando una questione di politica pubblica. Esplora la governance dell'IA, gli appalti pubblici, l'accessibilità, la gestione responsabile e la responsabilità democratica.

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Artificial intelligence has become an increasingly significant component of contemporary public administration, reshaping how governments allocate resources, procure services, deliver public programs, and interact with citizens (Wirtz et al., 2019; Zuiderwijk et al., 2021). The rapid expansion of AI across the public sector has generated substantial scholarly interest in algorithmic governance, digital government, public value, and administrative innovation, reflecting a broader recognition that emerging technologies are transforming both the practice and institutions of government (Margetts & Dunleavy, 2013; Cordella & Bonina, 2012; Moore, 1995). Within this broader transformation, Sign Language Artificial Intelligence (SLxAI) has emerged as one of

the most consequential developments in accessibility technology. Advances in computer vision, multimodal machine learning, and computational linguistics have substantially improved the ability of computational systems to recognize, generate, and translate signed languages, creating new opportunities to expand communication access for Deaf communities (Bragg et al., 2019). Consequently, scholarly attention has understandably focused on improving technical capability through increasingly sophisticated algorithms, larger datasets, and more advanced language models. At the same time, commercial investment has accelerated the development of AI enabled accessibility products, positioning Sign Language AI as an increasingly viable component of public service delivery.

Despite these advances, comparatively limited attention has been devoted to the institutional responsibilities that accompany governmental adoption of AI enabled accessibility technologies. Existing scholarship has made important contributions to artificial intelligence ethics, trustworthy AI, algorithmic accountability, disability policy, and digital government, yet these bodies of literature have largely evolved along parallel disciplinary trajectories (Jobin et al., 2019; Floridi & Cowls, 2019; Veale & Brass, 2019). Computer scientists have concentrated on technical performance and system design, legal scholars have examined regulatory implications, and public administration researchers have explored digital governance and public value. Relatively little research, however, has examined how these perspectives converge when governments procure artificial intelligence systems intended to fulfill accessibility obligations and mediate communication between citizens and the administrative state. This interdisciplinary gap becomes increasingly significant as public agencies evaluate AI enabled accessibility technologies for deployment within education, healthcare, workforce development, emergency management, judicial systems, and other essential public services.

The institutional adoption of Sign Language Artificial Intelligence fundamentally changes the nature of the policy conversation because government procurement is not merely an administrative transaction. Procurement represents an exercise of public authority through which democratic institutions allocate public resources, establish policy priorities, and shape the delivery of public services (Thai, 2001; Grandia & Meehan, 2017). As governments increasingly evaluate, procure, and deploy AI enabled accessibility technologies, technical performance becomes only one dimension of a broader governance challenge. Decisions concerning procurement integrity, administrative discretion, transparency, accountability, ethical implementation, and demo-



cratic legitimacy become equally important because they determine not only whether a technology functions, but whether its implementation advances the public interest while protecting civil rights and maintaining public trust (Denhardt & Denhardt, 2015; Bovens, 2007; Bryson et al., 2014). Accessibility technologies should therefore be understood not simply as software products or innovative procurement solutions, but as instruments of public governance that influence the relationship between citizens and the administrative state. This article argues that the continued integration of Sign Language Artificial Intelligence into public institutions marks an important inflection point in accessibility policy, requiring a corresponding shift in scholarly attention from technological capability toward public stewardship. It contends that the long term success of AI enabled accessibility will depend as much upon the quality of the institutions responsible for procuring, governing, evaluating, and sustaining these technologies as upon continued advances in artificial intelligence itself. Public administration, rather than computer science alone, therefore provides the conceptual and institutional framework through which Sign Language Artificial Intelligence should be understood, governed, and held accountable within democratic society.

I. Changing Conversations

Artificial intelligence has moved from the margins of public administration to an increasingly central role in the operation of contemporary government. Public agencies now employ AI across a broad spectrum of administrative functions, including fraud detection, emergency management, healthcare administration, workforce development, transportation planning, regulatory enforcement, and citizen engagement (Wirtz et al., 2019; Zuiderwijk et al., 2021). These developments have contributed to a growing body of scholarship examining digital government, algorithmic governance, and the transformation of administrative decision making in the twenty first century (Margetts & Dunleavy, 2013; Cordella & Bonina, 2012). What was once viewed as an emerging technology is increasingly understood as part of the institutional infrastructure through which governments allocate resources, implement policy, and deliver public services. Accessibility technologies have evolved within this broader transformation. Sign Language Artificial Intelligence (SLxAI), encompassing systems capable of recognizing, translating, generating, or otherwise facilitating signed communication through computational methods, has progressed from experimental laboratory research to an expanding commercial ecosystem supported by advances in computer vision, multimodal machine learning, and computational linguistics (Bragg et al., 2019). Yet



despite this institutional evolution, much of the prevailing discourse continues to reflect the priorities of engineering rather than those of public administration. Scholarly publications understandably emphasize algorithmic performance, benchmark accuracy, dataset development, model optimization, and technical scalability, while commercial discussions frequently focus on innovation, market adoption, and product capability. These contributions have substantially advanced the technological maturity of the field. Comparatively less attention, however, has been devoted to the institutional responsibilities that arise when governments begin procuring and deploying AI enabled accessibility technologies as instruments of public service delivery (Veale & Brass, 2019; Jobin et al., 2019). The result is not a deficiency in technological innovation but an emerging need for governance scholarship capable of addressing how democratic institutions should oversee, evaluate, and sustain these systems over time.

Governmental adoption fundamentally changes the character of this conversation because procurement is neither a purely technical nor a politically neutral activity. Within public administration, procurement functions as a mechanism through which governments allocate public resources, establish policy priorities, exercise administrative discretion, and create enduring relationships with private organizations responsible for delivering public value (Thai, 2001; Grandia & Meehan, 2017). When agencies evaluate competing accessibility technologies, negotiate contractual obligations, establish performance expectations, and determine how AI systems will mediate communication between citizens and the state, they are exercising public authority rather than simply purchasing software. These decisions shape the implementation of disability rights, influence the distribution of accessibility resources, and establish the institutional conditions under which accountability will be maintained when technological systems inevitably encounter limitations or failure. Consequently, the introduction of Sign Language Artificial Intelligence into public institutions transforms what might otherwise appear to be a technical innovation into an emerging question of public governance. Considerations of transparency, procurement integrity, oversight, administrative ethics, democratic legitimacy, and public stewardship become inseparable from questions of algorithmic performance because they determine how governments fulfill their obligations to the communities they serve (Bovens, 2007; Denhardt & Denhardt, 2015; Bryson et al., 2014). This article therefore argues that Sign Language Artificial Intelligence should be understood not solely as an accessibility technology but as an emerging object of public policy. Its future will depend not only upon continued advances in machine learning, but equally upon the quality of the governance structu-



res through which democratic institutions procure, implement, evaluate, and remain accountable for AI enabled accessibility throughout its operational life cycle.

II. The Evolution of Sign Language Artificial Intelligence

The development of Sign Language Artificial Intelligence may be understood as unfolding across three broad and interconnected stages that reflect changing technological capabilities, institutional priorities, and policy contexts. Although the boundaries between these stages are not absolute, they provide a useful analytical framework for understanding how SLxAI has evolved from an area of specialized computer science research into an emerging concern for public administration. This progression parallels broader developments in artificial intelligence, where advances in machine learning have increasingly shifted scholarly attention from questions of technical feasibility toward issues of governance, ethics, and institutional implementation (Wirtz et al., 2019; Zuiderwijk et al., 2021). The three-stage framework proposed here is intended not as a rigid historical classification, but as a conceptual model through which the changing relationship between technology and public governance may be examined.

The first stage was defined primarily by the pursuit of technical feasibility. Researchers sought to determine whether computational systems could reliably recognize, classify, interpret, and ultimately generate signed languages through advances in computer vision, pattern recognition, machine learning, and computational linguistics (Bragg et al., 2019). Significant effort was devoted to handshape recognition, gesture tracking, body pose estimation, facial expression analysis, and the linguistic modeling of signed languages, reflecting growing interdisciplinary collaboration among computer scientists, linguists, accessibility researchers, and Deaf communities. During this period, the central research question was straightforward: could machines meaningfully process signed communication with sufficient accuracy to support practical applications? Success was therefore measured primarily through benchmark performance, recognition accuracy, computational efficiency, and improvements in algorithmic capability. Institutional questions concerning governance, procurement, administrative accountability, and public policy received comparatively little scholarly attention because the technologies themselves remained largely confined to academic laboratories and experimental research environments. The primary objective was scientific validation rather than institutional deployment.

As computational capabilities matured, Sign Language Artificial Intelligence entered a second stage characterized by commercialization and market expansion. Improvements in deep learning architectures, multimodal foundation models, cloud computing, and large scale data processing substantially expanded the practical applications of AI enabled accessibility technologies. Research prototypes increasingly evolved into commercial products intended for deployment within education, healthcare, employment services, customer support, and other communication intensive environments. Venture capital investment, startup formation, and growing interest from established technology firms accelerated innovation while introducing new commercial incentives that increasingly influenced research priorities. Developers emphasized AI powered interpreting tools, avatar based communication systems, automated translation platforms, and multilingual accessibility services as scalable solutions to longstanding communication barriers. Public demonstrations and media coverage further expanded awareness of Sign Language Artificial Intelligence, contributing to expectations that AI would become an increasingly significant component of accessibility infrastructure. Yet commercialization also shifted the underlying logic of technological development. Decisions concerning product design, proprietary architectures, deployment strategies, competitive differentiation, and intellectual property became influenced not only by scientific objectives but also by market considerations. Accessibility technologies therefore entered an environment where innovation was increasingly shaped by commercial opportunity alongside accessibility outcomes.

A third stage is now emerging in which the defining characteristic is no longer technical innovation or commercial maturity, but institutional adoption. Governments, educational systems, healthcare providers, workforce development agencies, courts, emergency management organizations, and other public institutions are increasingly evaluating artificial intelligence as part of broader digital transformation strategies (Wirtz et al., 2019; Margetts & Dunleavy, 2013). In this context, Sign Language Artificial Intelligence is no longer simply an experimental technology or a commercial product awaiting market acceptance. It has become a candidate for public procurement, administrative implementation, and long term institutional integration. This transition fundamentally alters both the responsibilities associated with AI accessibility and the scholarly questions that accompany its deployment. Public agencies must determine how vendors should be evaluated, which accessibility standards should govern procurement, how contractual performance should be monitored, and what mechanisms will ensure accountability when AI mediated communication produces inequitable or



unintended outcomes. Decisions that were previously confined to engineering teams and private firms increasingly become matters of administrative judgment subject to legal obligations, democratic oversight, fiscal stewardship, and public accountability (Thai, 2001; Bovens, 2007; Denhardt & Denhardt, 2015). The evolution of Sign Language Artificial Intelligence therefore represents more than a sequence of technological advances. It reflects a broader institutional transformation in which accessibility technologies increasingly become instruments of public governance. As governments assume the roles of purchaser, regulator, steward, and evaluator, the central questions surrounding SLxAI necessarily expand beyond algorithmic performance to encompass the governance structures through which democratic societies manage emerging technologies in the public interest.

III. From Technology to Public Administration

The institutional evolution of Sign Language Artificial Intelligence requires a corresponding evolution in the questions scholars and practitioners ask of these systems. Throughout the first two stages of SLxAI development, research was understandably dominated by engineering concerns involving algorithmic accuracy, computational efficiency, multimodal learning, and the technical feasibility of machine mediated signed communication (Bragg et al., 2019). These questions remain essential because accessibility technologies cannot fulfill their intended purpose without demonstrating reliable technical performance. Engineering disciplines therefore continue to make indispensable contributions by improving recognition accuracy, reducing computational error, optimizing model architectures, and expanding the capabilities of artificial intelligence. Yet governmental adoption introduces a second category of questions that engineering alone is not designed to answer. An algorithm capable of translating signed communication with remarkable precision offers no inherent guidance regarding whether it should be procured by a public agency, what ethical principles should govern its implementation, how procurement decisions should balance competing public interests, or who bears responsibility when technological limitations undermine equitable access to public services. Likewise, computer science does not seek to resolve questions concerning administrative transparency, procedural fairness, democratic oversight, institutional legitimacy, or the exercise of public authority because these issues fall within the domain of governance rather than engineering. The distinction is therefore not between successful and unsuccessful technology, but between technical capability and institutional responsibility. Once Sign Language Artificial Intelligence



becomes embedded within governmental decision making and public service delivery, it enters an environment in which technical performance remains necessary but no longer sufficient.

For this reason, public administration provides the complementary institutional framework through which the next stage of Sign Language Artificial Intelligence should be examined. Public administration has long been concerned with the stewardship of public resources, the exercise of administrative discretion, the implementation of public policy, and the creation of public value through legitimate governmental institutions (Moore, 1995; Denhardt & Denhardt, 2015; Bryson et al., 2014). Rather than asking only whether a technological system is capable of performing a designated function, public administration asks whether its implementation advances the public interest while remaining consistent with democratic values, statutory obligations, ethical governance, and institutional accountability. This perspective is especially relevant within accessibility policy because decisions concerning communication access frequently involve competing public priorities, finite fiscal resources, legal mandates, and the protection of historically marginalized communities. Procurement officials, agency administrators, disability coordinators, legal counsel, and elected representatives routinely make judgments extending well beyond technical evaluation. They determine which accessibility needs receive priority, how competing vendors are assessed, what contractual safeguards should be incorporated into procurement, how performance should be monitored over time, and how citizens may obtain meaningful remedies when public systems fail to provide equitable access. Artificial intelligence therefore enters an administrative environment already governed by institutional norms, legal responsibilities, and democratic expectations that cannot be reduced to questions of computational performance alone.

Recognizing Sign Language Artificial Intelligence as an instrument of public administration also requires reconsidering the role of accessibility technologies within the administrative state. Infrastructure has traditionally been associated with physical assets such as transportation systems, utilities, and communications networks because these enable citizens to participate fully in economic and civic life. Increasingly, however, scholars have argued that digital technologies perform comparable institutional functions by mediating interactions between governments and the populations they serve (Margetts & Dunleavy, 2013; Cordella & Bonina, 2012). Online benefit systems, electronic health records, digital identity platforms, emergency notification systems, and automated public information services have become essential components of con-

temporary governance because they shape how citizens exercise rights and obtain access to public programs. Sign Language Artificial Intelligence is beginning to occupy a similar position within the accessibility ecosystem. When deployed by public agencies, these systems influence how Deaf citizens communicate with government personnel, participate in administrative proceedings, obtain critical information, and exercise rights guaranteed under disability law. Their significance therefore extends beyond software functionality to encompass the institutional architecture through which democratic governments deliver equitable public services. Like other forms of administrative infrastructure, AI enabled accessibility systems require sustained investment, procurement oversight, governance, maintenance, evaluation, and public accountability throughout their operational life cycle. Understanding SLxAI in this manner fundamentally reframes the policy conversation. The central challenge confronting governments is no longer simply how to build increasingly capable technologies, but how to govern those technologies in ways that strengthen institutional legitimacy, protect civil rights, and preserve public trust within democratic public administration.

IV. Procurement as Public Policy

Public procurement is commonly described as the administrative process through which governments acquire the goods and services necessary to fulfill their operational responsibilities. Although procedurally accurate, this description understates procurement's broader significance within democratic governance. Public administration scholars have increasingly recognized procurement as a strategic instrument through which governments pursue policy objectives, stimulate innovation, allocate public resources, and shape relationships between the public and private sectors (Thai, 2001; Edler & Georghiou, 2007; Grandia & Meehan, 2017). Every solicitation, evaluation criterion, contract award, renewal decision, and performance requirement reflects governmental priorities while influencing the future direction of public investment. Procurement therefore extends well beyond purchasing. It determines which organizations become partners in delivering public services, establishes expectations for institutional performance, and communicates the values that will guide administrative decision making. Through procurement, governments not only acquire technology but also create governance relationships that influence markets, organizational behavior, and the long term capacity of public institutions to fulfill their obligations to citizens. Viewed from this perspective, procurement constitutes an exercise of public authority



that deserves the same analytical attention afforded to legislation, regulation, and other formal instruments of public policy.

> Governance does not begin once artificial intelligence is deployed. It begins during procurement.

The governance significance of procurement becomes particularly apparent when examined through the lens of accessibility. Decisions concerning the acquisition of Sign Language Artificial Intelligence involve considerably more than technical comparisons among competing software products. They influence which communication models receive public investment, which accessibility approaches become institutionalized, and how governments ultimately fulfill statutory and ethical obligations to Deaf citizens under disability policy (United Nations, 2006; Jaeger, 2012). Vendor selection directly affects the quality of language access available within schools, healthcare systems, courts, workforce development agencies, emergency management organizations, and other public institutions where effective communication is essential to equitable participation. Procurement decisions likewise influence whether AI enabled accessibility complements existing human accommodations, supplements professional interpreting services, or inadvertently creates new barriers through inappropriate implementation. Because public contracts frequently involve substantial investments in software integration, training, maintenance, cybersecurity, and data infrastructure, procurement also creates forms of technological dependence that shape future administrative choices long after an initial contract has been executed. Governments therefore assume responsibilities extending beyond the identification of technically capable vendors. They must evaluate the broader institutional consequences of embedding particular technologies within administrative systems that citizens rely upon to exercise legal rights, obtain public services, and participate fully in civic life.

Perhaps most importantly, procurement establishes the governance architecture within which artificial intelligence will operate long before deployment begins. Contracts define performance expectations, accessibility obligations, reporting requirements, auditing procedures, data governance standards, monitoring mechanisms, and corrective actions that collectively determine how governmental oversight will be exercised throughout a technology's operational life cycle. Decisions regarding vendor qualifications, evaluation criteria, independent verification, contract renewal, dispute resolu-

tion, and ongoing performance measurement create the institutional framework through which accountability is maintained after implementation. Governance therefore does not begin once artificial intelligence is deployed. It begins during procurement, when public agencies determine the rules, responsibilities, and oversight structures that will govern the technology for years to come. This observation carries particular significance for Sign Language Artificial Intelligence because opportunities to strengthen transparency, accountability, and institutional oversight become substantially more limited once contractual relationships and technical infrastructures are firmly established. The effectiveness, legitimacy, and trustworthiness of AI enabled accessibility systems will therefore depend not only upon advances in machine learning, but also upon the quality of the governance structures negotiated before those systems ever mediate communication between governments and the citizens they serve. Procurement should consequently be understood not as the administrative conclusion of technology acquisition, but as the institutional point at which public governance begins.

V. The Governance Gap

The emergence of Sign Language Artificial Intelligence within public institutions has revealed what this article describes as the Governance

TIPS

Know something about a sign language AI system that the public should know? Send it to tips@novaracg.com. Every tip is read by me and kept confidential. If you work in the UK, writing to us is not by itself a protected disclosure under the Public Interest Disclosure Act 1998, so before you share employer information, check your options with Protect (protect-advice.org.uk), the free whistleblowing advice line.

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