Emerging models of national competent authorities under the EU AI Act.

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Abstract. This paper examines the emerging models of national competent authorities under the European Union's Artificial Intelligence Act (AI Act), providing novel insights into how different jurisdictions approach AI governance institutionalization. Through systematic analysis of official documents from early implementing Member States, we identify three fundamental dimensions that characterize distinct regulatory approaches. First, the organizational architecture reveals a spectrum from centralized to fragmented oversight models, reflecting different philosophies about coordinated versus distributed AI governance. Second, the institutional choices between leveraging existing regulatory bodies versus establishing new AI-specific authorities highlight contrasting approaches to building governance capacity and expertise. Third, the regulatory scope demonstrates a critical divide between horizontal and vertical oversight frameworks, with some jurisdictions pioneering hybrid solutions that attempt to balance specialized knowledge with coordinated supervision. Our methodology combines document analysis of legislative proposals, government resolutions, and administrative acts with a three-dimensional analytical framework examining degrees of centralization, institutional arrangements, and oversight models. The findings contribute to the theoretical understanding of AI governance by revealing how different jurisdictions interpret and operationalize regulatory requirements, balance competing institutional priorities, and address the complex challenge of overseeing AI systems. Furthermore, the analysis offers insights into the evolution of AI governance structures and contributes to the broader discourse on institutional design for emerging technology oversight. While our analysis is limited to early implementers and based primarily on formal documents rather than operational evidence, it provides a foundation for future research examining the effectiveness of different models, their evolution over time, and their impact on AI innovation and oversight. Future studies could benefit from comparative analyses of implementation outcomes, stakeholder perspectives, and the practical challenges of operationalizing these different governance frameworks.

Keywords. Artificial intelligence, European Union, AI Act, AI governance, National competent authorities
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1. Introduction

The rapid evolution of artificial intelligence (AI) technologies and their increased integration into various sectors have generated both enthusiasm and a greater level of attention towards policy frameworks and governance. The European Union (EU) has taken a pioneering step in this direction with the introduction of the Artificial Intelligence Act (Regulation (EU) 2024/1689), establishing the first comprehensive regulatory framework across European Member States. This regulation is designed to enhance innovation by fostering trustworthy AI, ensuring the protection of societal well-being (Laux, 2024), in compliance with EU values and fundamental rights. This highlights the need for robust oversight mechanisms to build public trust in AI technologies while guaranteeing a

flexible and comprehensive regulatory framework to accommodate cultural differences and bridge gaps across different national legal systems (Gasser, 2017). The AI Act, which came into force in August 2024, sets the standard framework that European Member States must comply with to ensure that society understands AI's capabilities and limitations, while promoting development and innovation (Lu, 2024). The AI Act also mandates the inclusion of diverse stakeholders in the governance scheme to ensure equitable representation and avoid potential biases (Cancela-Outeda, 2024). Since the conclusion of the technical negotiations in January 2024, Member States have adopted various strategies to implement the new regulation. The challenges they face are primarily focused on resource allocation, both financial and human. The latter is particularly driven by the complexity of the matter, which demands expertise from diverse fields as the technology evolves (Cancela-Outeda, 2024) with regulatory standards, addressing ethical concerns, and promoting transparency in AI decision-making (Bellogìn, 2024). This paper provides a comparative analysis of the implementing approaches adopted by European Member States in response to the European Union's Artificial Intelligence Act, in terms of national governance of artificial intelligence systems. It focuses on the legal and governance repercussions and emphasizes the diversity of models implemented at the national level, ranging from centralized to fragmented systems. While other scholars identified the possible divergences in the selection of national competent authorities by Member States (Novelli, 2024), comprehensive studies in the field are still limited. The aim is to offer practical insights into the challenges and opportunities of AI governance implementation. The paper is organized as follows: this first section introduces the key features of AI governance and its objectives. The second section presents research methods. The third section highlights the legal framework (AI Act), together with the implementation challenges related to the complexity of the regulatory infrastructure that should guarantee both effective surveillance and operational capabilities. The fourth is a detailed analysis of the different national models adopted, ranging from centralized to fragmented, from existing bodies to newly established institutions, and from horizontal to vertical oversight, mainly because of different national administrative and economic needs. The fifth presents the main discussion of the governance paths encountered. The final section offers conclusions and recommendations for policymakers, together with the limitations and potential future directions of the research.

2. Research methods

2.1 Document analysis

The document analysis process relied on official legislative and administrative sources from EU Member States. Our data collection focused on four main categories of official documents: (1) legislative proposals submitted to national parliaments; (2) government resolutions and administrative acts; (3) official online communications from relevant ministries and regulatory bodies; and (4) draft laws and amendments to existing legislation. These documents were collected through systematic monitoring of official government websites, parliamentary databases, and official journals of Member States. To ensure comprehensiveness, we based our research on documents in their original languages, employing translations, when necessary, which inevitably introduces interpretive considerations and risk of misinterpretation. The selection criteria required documents to: (a) explicitly address the implementation of Articles 28 and 70 of the AI Act regarding competent authorities, (b) represent formal government positions rather than preliminary or unofficial proposals, and (c) contain specific details about institutional arrangements and governance structures. This approach allowed us to focus on concrete implementation steps while excluding general policy discussions or preliminary proposals that had not reached formal legislative or administrative status. In some cases, such as Cyprus and Malta, we supplemented documentary evidence with correspondence with officials of the relevant institutions. While this enhanced our understanding of these specific cases, the dynamic nature of implementation processes across Member States suggests that current institutional arrangements may continue to evolve beyond what is captured in official documentation. This initial mapping provides a foundation for ongoing research as the practical implementation of the AI Act unfolds across the European Union.

2.2 Temporal framework

In addition, this research adopts a defined temporal framework shaped by two key dates: the entry into force of the EU AI Act (August 2024) and our data collection cutoff date (April 2025). This timeframe captures the initial months of implementation efforts by Member States, providing insights into early strategic approaches while acknowledging that the process remains ongoing until the deadline of August 2025 set by the AI Act for appointing national competent authorities. The decision to analyze this early implementation period, rather than waiting for the complete implementation across all Member States, is methodologically significant for several reasons. First, it allows us to identify emerging patterns and potential challenges in the implementation process as they unfold, providing valuable insights for Member States still developing their approaches. Second, examining early adopters' choices helps understand different interpretative approaches to the AI Act's requirements, particularly regarding institutional arrangements and governance models. Finally, while this temporal limitation means our analysis cannot capture the complete EU-wide implementation landscape, it offers a crucial snapshot of how Member States

with different administrative traditions and regulatory capacities interpret and operationalize the AI Act's requirements for competent authorities.

2.3 Comparative analysis

Considering the insights already identified in the different patterns of AI national competent authorities (Novelli, 2024), the analysis employs a three-dimensional framework developed to systematically examine different implementation models. This framework emerged from iterative analysis of the implementation approaches and theoretical considerations from the literature on regulatory governance. The first dimension analyzes the degree of centralization in oversight responsibilities, categorizing approaches as centralized (single government authority with broad mandate), unified (single independent authority), or fragmented (multiple authorities with distributed responsibilities). The second dimension examines institutional choices between leveraging existing regulatory bodies versus establishing new AI-specific institutions, focusing on how Member States balance their organizational needs with the deadlines of the AI Act. The third dimension considers the scope of oversight, distinguishing between sectoral/verical approaches (domain-specific regulation) and broad/horizontal oversight (comprehensive cross-domain supervision). For each dimension, we developed specific indicators to ensure consistent categorization: centralization is assessed through the number and hierarchical relationships of designated authorities; institutional choice is evaluated based on whether new bodies are created, or existing ones are empowered; and oversight scope is determined by examining the breadth of regulatory mandates and coordination mechanisms. While limited in scope, this framework enables systematic comparison while accommodating the complexity and diversity of national implementation strategies.

2.4 Clustering

The clustering methodology involved a systematic comparison of national implementation models based on their shared characteristics and divergences. We first developed a comparative matrix (presented in Table 1) mapping each country's designated authorities against two key variables: type of national authority (market surveillance and notifying) and governance approach (government control vs. independent body). This initial mapping enabled the identification of distinct implementation clusters. The clustering process followed three sequential steps: first, countries were grouped based on their primary organizational approach (centralized, unified, or fragmented); second, within each primary cluster, we analyzed sub-patterns related to institutional choices (existing vs. new bodies) and oversight models (sectoral vs. horizontal); finally, we examined outlier cases and hybrid approaches that combined elements from different models. This multi-level clustering approach revealed not only the predominant implementation patterns but also the nuanced variations within each cluster, particularly in how Member States balance different institutional and governance requirements.

3. Theoretical background

The theoretical background of this research is the European Union's Artificial Intelligence Act, or AI Act (Regulation (EU) 2024/1689). The AI Act establishes a comprehensive framework for the regulation of artificial intelligence systems in the European Union, requiring Member States to designate or establish competent authorities for its implementation. These authorities, comprising market surveillance authorities (art. 70) and notifying authorities (art. 28), are fundamental to ensuring compliance with the regulation's requirements and maintaining oversight of AI systems within the EU market.

3.1 Legal framework

The AI Act defines two types of competent authorities: market surveillance authorities and notifying authorities. While Member States have the flexibility to designate or establish these authorities according to their organizational needs, the regulation sets forth strict requirements regarding their independence, resources, and operational capabilities. A key principle established by Article 70 is that these authorities must "exercise their powers independently, impartially and without bias so as to safeguard the objectivity of their activities and tasks." This independence in exercising their powers is crucial for ensuring effective oversight of AI systems and maintaining public trust in the regulatory framework.

3.2 Market surveillance authorities

The market surveillance authority plays a crucial role in the AI Act's enforcement mechanism. While building upon established market surveillance principles from Regulation (EU) 2019/1020, the AI Act extends these authorities' responsibilities to address the unique challenges of AI systems under Article 70 provisions. Market surveillance authorities - responsible for the national supervision of AI systems - may take measures in relation to all AI systems when they present a risk in accordance with the AI Act (e.g. high-risk AI systems in the area of biometrics), perform market surveillance duties under Article 74 and report to the European Commission about the use of prohibited practices that occurred during that year and about the measures taken. Member States must designate one market surveillance authority as their single point of contact for the AI Act, creating a clear channel for coordination at

both national and EU levels. This designation facilitates the exchange of information and best practices among authorities across Member States, as encouraged by Article 70(7).

3.3 Notifying authorities

Article 28 outlines distinct responsibilities for notifying authorities, focusing on their role in the conformity assessment ecosystem. Their core functions include: (1) setting up and carrying out procedures for assessment of conformity assessment bodies, (2) designating and notifying these bodies, (3) monitoring their ongoing compliance, and (4) developing these procedures in cooperation with other Member States' notifying authorities. To maintain integrity in the assessment process, notifying authorities must: ensure decisions about notification are made by different personnel than those conducting assessments, avoid any conflicts of interest with conformity assessment bodies, refrain from offering services that conformity assessment bodies perform, maintain strict confidentiality of information obtained during their activities.

3.4 Structural and organizational requirements

The regulation provides Member States with significant flexibility in organizing their competent authorities. Article 70(1) explicitly states that the activities and tasks may be performed by one or more designated authorities, according to each Member State's organizational needs. However, this flexibility is balanced with specific structural requirements: (1) at least one notifying authority and one market surveillance authority must be designated, (2) one authority must be designated as a single point of contact, (3) information about how to contact these authorities must be publicly available through electronic means, and (4) regular reporting to the Commission on resources and adequacy is required.

3.5 Resource and expertise requirements

The AI Act places significant emphasis on ensuring competent authorities are adequately resourced and staffed. Article 70(3) mandates that Member States must provide their national competent authorities with adequate technical, financial, and human resources, along with the necessary infrastructure to effectively fulfill their tasks under the regulation. Specifically, competent authorities must maintain a sufficient number of permanently available personnel with expertise in: AI technologies, data and data computing, personal data protection, cybersecurity, fundamental rights, health and safety risks, existing standards and legal requirements. Member States are required to assess and update these competences and resource requirements annually, ensuring their authorities maintain the capacity to address evolving technological challenges. This comprehensive expertise requirement reflects the complex and multidisciplinary nature of AI oversight (Dwivedi, 2021).

3.6 Implementation challenges

The implementation of competent authorities under the AI Act presents several significant challenges that Member States must address to ensure effective oversight of AI systems. The resource allocation requirement represents a substantial hurdle, as Member States must ensure adequate funding and staffing by 2 August 2025 to ensure the appointment of national competent authorities (Article 70(2)). From an institutional theory perspective, it might pose challenges in terms of competition among institutions for resource allocation (Shao, 2020). The biennial reporting obligation to the Commission on financial and human resources creates an ongoing accountability mechanism, but also highlights the sustained commitment required. Member States must not only secure initial funding but also maintain and potentially increase resources as the AI landscape evolves and regulatory demands grow, a global tendency in AI governance worldwide (Zaidan, 2024). In terms of AI governance frameworks, those authorities can represent the operationalization of the technical and the social/legal layers of the layered model for AI governance in Gasser and Almeida (2017). The need for personnel with deep understanding across multiple domains creates significant recruitment and retention difficulties. Competent authorities must compete with private sector employers who can often offer more attractive compensation packages to professionals with expertise in AI, data science, and cybersecurity. Moreover, the requirement for expertise in market surveillance and legal frameworks alongside technical knowledge creates a need for either rare multidisciplinary professionals or carefully balanced teams that can work effectively together. Indeed, the expertise requirements pose a particularly complex challenge in the current technology labor market (Medaglia, 2024). Coordination complexity emerges as another significant challenge, particularly in cases where AI systems intersect with multiple regulatory domains (Feijóo, 2020). The requirement for consultation with authorities under other EU legislation demands careful orchestration of administrative processes and decision-making procedures. This becomes especially challenging when time-sensitive decisions are required, or when different authorities may have overlapping or potentially conflicting perspectives on specific AI applications. The mandate to maintain operational independence while ensuring effective oversight creates institutional design challenges that go beyond simple organizational structures (Fountain, 2004). Member States must establish governance mechanisms that protect authorities from undue influence while maintaining appropriate accountability. This becomes particularly complex in Member States where regulatory responsibilities are distributed across multiple bodies, requiring careful balancing of autonomy and coordination.

4. Analysis of implementation models of competent authorities

This section analyzes the implementation pattern of countries that took concrete steps from a normative point of view (e.g. legislative proposals, regulations, mandates, etc.) to address the appointment of AI competent authorities under the EU AI Act (art. 28 and 70). The deadline set forth by the AI Act for the appointment of such authorities is 2 August 2025. In April 2025, most of the EU countries did not take official legislative steps to appoint neither the notifying authority, nor the market surveillance authority. These are Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Ireland, Latvia, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden. It should be noted that the AI Act is a text with European Economic Area relevance, meaning that it also applies to Iceland, Norway and Liechtenstein. Nonetheless, none of them appointed the national competent authorities before April 2025. It should also be noted that two countries, Cyprus and Malta, already identify competent authorities in their government websites, but with no implementing law in place at the moment of the analysis. These are marked as *planned*.

4.1 Cyprus (planned)

Cyprus has taken initial steps toward implementing the AI Act, with the Council of Ministers approving a national governance structure in January 2025 (Vice Minister of Research press release of 22 January 2025) to designate competent authorities for oversight. Cyprus has divided responsibilities between just two existing regulatory bodies, creating a streamlined system. The Commissioner for Communications serves multiple key roles: notifying authority, market surveillance authority, and the single point of contact required by the AI Act. This concentration of responsibilities reflects a centralized approach using existing regulatory infrastructure rather than creating new institutions. The Commissioner for Personal Data Protection serves as an additional market surveillance authority, specifically for matters related to its existing areas of application. This allocation of oversight responsibilities to the data protection authority follows a pattern seen in other Member States, recognizing the overlap between AI governance and data protection concerns. The Commissioner for Communications, which already has a broad mandate in electronic communications and postal services markets, extends its regulatory functions to encompass AI systems. This leverages existing regulatory expertise and infrastructure while expanding to address challenges presented by artificial intelligence. Without implementing legislation currently in place, specific procedural details and enforcement mechanisms remain undefined, including how the two designated authorities will coordinate their activities and how sanctions will be determined and applied for non-compliance with the AI Act's provisions.

4.2 Finland

In June 2024, the Finnish Ministry of Employment and the Economy issued a proposal to designate the independent AI authorities that would act as market surveillance authority and notifying authority (Government's bill n. TEM050:00 of 2024). The Finnish proposal distributes oversight responsibilities of market surveillance across multiple existing government regulatory bodies rather than creating a single centralized authority. The agencies that currently monitor product safety, transportation, digital systems, healthcare equipment, and financial markets – in addition to the data protection authority - extend their supervisory duties to include AI systems within their respective domains. Specifically, these are: the Safety and Chemicals Agency, the Transport and Communications Agency (also acting as the single point of contact referred to in Article 70(2) of the AI Act), the Ministry of Social Affairs and Health, the occupational safety and health divisions of Regional State Administrative Agencies, the Centre for Safety and Development of Medicinal Products, the Energy Authority, the South Savo Centre for Economic Development, Transport and the Environment, the Financial Supervisory Authority, the National Supervisory Authority for Welfare and Health, councilors elected by Parliament, and the Data Protection Supervisor. At the same time, the Ministry of Economic Affairs and Employment, the Transport and Communications Agency, the Medicines Agency, the Ministry of Social Affairs and Health, and the Data Protection Supervisor have been proposed as notifying authorities. Governance models emphasizing distributed authority potentially enhance substantive effectiveness through domain-specific expertise while introducing coordination challenges that compromise procedural efficiency. Recognizing this trade-off carries important implications for institutional design generally, highlighting the necessity of governance arrangements that maintain appropriate equilibrium between specialized expertise and coordination capacity.

4.3 Hungary

According to the latest resolution (Government resolution n. 1301of 2024), Hungary established the new Hungarian Artificial Intelligence Council, which shall perform the official tasks both of notifying and market surveillance authorities under the AI Act. The Council is established under the supervision of the Minister of National Economy. This single organization is designed to provide a streamlined "one-stop shop" for AI governance while fulfilling all the regulatory requirements prescribed by the AI Act, including serving as the mandated single point of contact. The institutional innovation strategy of establishing a new AI-specific body represents a distinctly different conceptualization of effective AI governance, one that prioritizes specialized focus and organizational adaptability over institutional continuity and established expertise.

4.4 Italy

The Italian Parliament (Senate Bill n. 1146 of 2024) proposed to appoint the National Cybersecurity Agency (ACN) as market surveillance authority with monitoring, inspection and enforcement powers, and the Agency for Digital Italy (AgID) as notifying authority. Both agencies - the first managing the national cybersecurity issues, the latter being the technical IT agency of the government - work under the supervision of the Presidency of the Council of Italy. The designation of a cybersecurity agency as the primary market surveillance authority reflects Italy's strategic view of AI governance as fundamentally intertwined with digital security concerns. AgID instead provides experience in developing technical standards, managing digital transformation initiatives, and coordinating public administration technology adoption. To ensure effective coordination, the legislation establishes a Coordination Committee at the Presidency of the Council of Ministers, composed of the directors general of both agencies and the head of the Department for Digital Transformation. This mechanism aims to maintain consistency in Italy's overall approach to AI governance despite the functional division between market surveillance and notification responsibilities.

4.5 Lithuania

In Lithuania, the amendments adopted by the government (Government resolution n. 860 of 2024) set out a specific role for the Innovation Agency, which, together with the Communications Regulatory Authority (*Lietuvos Respublikos ryšių reguliavimo tarnyba*, RRT), will be the main body responsible for implementing the EU's Artificial Intelligence Act. RRT is meant to be an agency transcending traditional supervisory functions to become a facilitative partner promoting coordination and multi-stakeholder dialogue. The Innovation Agency has been designated as the national notifying authority, while the Communications Regulatory Authority will act as the market supervisor and single point of contact. Innovation Agency Lithuania is a non-profit agency under the Lithuanian Ministry of Economy and Innovation. The Communications Regulatory Authority of the Republic of Lithuania is an independent state institution regulating electronic communications, postal, rail markets and as well as performing supervision of trust service providers. Lithuania's implementation approach for the AI Act reflects a pragmatic balance between centralization and specialization. By assigning distinct but complementary roles to two established agencies, Lithuania has created a governance structure that avoids both excessive fragmentation and complete consolidation

4.6 Luxembourg

Luxembourg's Parliament introduced a new law to enact the AI Act (Parliament bill n. 8476 of 2024). The bill outlines the designation of national authorities responsible for applying and monitoring the AI Act, including the Luxembourg Institute for Standardization, Accreditation, Safety and Quality of Products and Services and the Government Data Protection Commission as notifying authorities. It also designates the National Commission for Data Protection as the market surveillance authority for high-risk AI systems used by law enforcement and other sectors and specifies other authorities for market surveillance based on sectoral supervision. Namely: Judicial Supervisory Authority, Financial Sector Supervisory Commission, Supervisory Authority for the Insurance Sector, Luxembourg Institute for standardization, accreditation, safety and quality of products and services, Luxembourg Regulatory Institute, Luxembourg Agency for Medicines and Health Products, and the Luxembourg's independent audiovisual authority. On top of this, as the horizontal market surveillance authority by default, the Commission for Data Protection (*Commissariat du gouvernement à la protection des données auprès de l'Etat, CGPD*) is responsible for coordination with market surveillance authorities and designated as the single point of contact. Luxembourg's approach to implementing the AI Act reveals a distinctive regulatory philosophy that emphasizes highly specialized oversight distributed according to existing regulatory competencies. This fragmented governance structure may offer advantages in terms of leveraging deep domain expertise but also creates potential coordination challenges that the CNPD, in its role as coordinator, will need to address.

4.7 Malta (planned)

As mentioned in their official websites in January 2025 and confirmed by their officials in January 2025 via direct correspondence, the Malta Digital Innovation Authority (MDIA) and the Information Data Protection Commission (IDPC) have been identified as market surveillance authorities in Malta by the latest draft government law. At the same time, the MDIA and the National Accreditation Board have been identified as notifying authorities. The MDIA is the primary government authority responsible for promoting governmental policies that promote Malta as the center for excellence for technological innovation. The IDPC is the national independent supervisory authority responsible for upholding the fundamental right of individuals to have their personal data protected and to monitor the application of data protection law in Malta. This designation reflects the Act's emphasis on protecting fundamental rights and freedoms of individuals potentially affected by autonomous decision-making technologies, with particular focus on transparency, security, data protection, robustness, accuracy, non-discrimination, and sustainability principles. The National Accreditation Board is a public entity, with no share ownership, commercial or other interest in any conformity assessment body and it operates on a not-for-profit basis. It is responsible for accreditation in accordance with the relevant national, international and European standards and guides, and the

applicable national, international and European regulations. This regulatory architecture demonstrates Malta's strategic approach to implementing the AI Act while leveraging existing institutional competencies.

4.8 Poland

The Polish draft act on artificial intelligence systems (Government bill n. UC71 of 2024) planned to establish a new market surveillance authority for artificial intelligence models and systems, which will be the Artificial Intelligence Development and Security Commission. The work of the Commission will be managed by the Chairman appointed by the Prime Minister of Poland. It is also proposed to designate the Department of Digital Affairs of the Chancellery of the Prime Minister of Poland, the institution responsible for computerization, as the authority responsible for notification of conformity assessment bodies and as the notifying authority. Poland has opted for a primarily consolidated regulatory architecture with clearly defined jurisdictional boundaries. This approach reflects Poland's strategic decision to create dedicated AI governance institutions rather than distributing responsibilities across existing regulatory bodies, enabling more focused expertise development while maintaining centralized coordination.

4.9 EU Institutions

Finally, as regards AI systems put into service or used by European Union institutions, the AI Act references to national competent authorities or market surveillance authorities shall be construed as references to the European Data Protection Supervisor (EDPS). In fact, artt. 70 and 74 state that where Union institutions, bodies, offices or agencies fall within the scope of the AI Act, the European Data Protection Supervisor shall act as the competent authority for their supervision, and as their market surveillance authority, except in relation to the Court of Justice of the European Union acting in its judicial capacity. The EDPS is an independent supervisory authority responsible for ensuring that EU institutions and bodies comply with data protection law when processing personal data.

Tab. 1 summarizes the results of the research.

Tab. 1: Emerging governance models of national competent authorities under the EU AI Act (*last update: January 2025*)

Country	Type of national authority	Institution	Governance	
			Government control	Independent body
Cyprus	Market surveillance authorities	Commissioner for Communications	X	
		Commissioner for Personal Data Protection		X
	Notifying authority	Commissioner for Communications	X	
Finland	Market surveillance authorities	Safety and Chemicals Agency	X	
		Transport and Communications Agency	X	
		Ministry of Social Affairs and Health	X	
		Regional State Administrative Agencies	X	
		Medicines Agency	X	
		Energy Authority	X	
		South Savo Centre for Economic Development, Transport and the Environment	X	
		Financial Supervisory Authority		X
		National Supervisory Authority for Welfare and Health	X	
		Councilors elected by Parliament	X	
		Data Protection Supervisor		X
	Notifying authorities	Ministry of Economic Affairs and Employment	X	
		Transport and Communications Agency	X	
		Medicines Agency	X	
		Ministry of Social Affairs and Health	X	
		Data Protection Supervisor		X
Hungary	Market surveillance authority	Artificial Intelligence Council	X	
	Notifying authority	Artificial Intelligence Council	X	

Italy	Market surveillance authority	National Cybersecurity Agency	X	
	Notifying authority	Agency for Digital Italy	X	
Lithuania	Market surveillance authority	Communications Regulatory Authority		X
	Notifying authority	Innovation Agency	X	
Luxembourg	Market surveillance authorities	National Commission for Data Protection		X
		Judicial Supervisory Authority		X
		Financial Sector Supervisory Commission	X	
		Supervisory Authority for the Insurance Sector		X
		Luxembourg Institute for standardization, accreditation, safety and quality of products and services	X	
		Luxembourg Regulatory Institute		X
		Luxembourg Agency for Medicines and Health Products		X
		Luxembourg's independent audiovisual authority		X
	Notifying authorities	Luxembourg Institute for Standardization, Accreditation, Safety and Quality of Products and Services	X	
		National Commission for Data Protection		X
Malta (*planned*)	Market surveillance authorities	Malta Digital Innovation Authority	X	
		Information Data Protection Commission		X
	Notifying authorities	Malta Digital Innovation Authority	X	
		National Accreditation Board		X
Poland	Market surveillance authority	Artificial Intelligence Development and Security Commission	X	
	Notifying authority	Department of Digital Affairs of the Chancellery of the Prime Minister	X	
EU	Market surveillance authority	European Data Protection Supervisor		X
	Notifying authority	European Data Protection Supervisor		X

Source: authors

5. Discussion

5.1 Centralized, unified, fragmented approaches

The analysis of early implementations of AI Act national competent authorities reveals three distinct organizational approaches among Member States. While most EU countries have yet to designate their competent authorities, the emerging patterns from early adopters provides valuable insights into different implementation strategies. These divergent implementation strategies reflect fundamental differences in administrative traditions, institutional capacities, and conceptualizations of effective technology governance across the European regulatory landscape. The centralized approach, adopted by Hungary, Italy, and Poland, places both market surveillance and notifying authority functions under direct government control. This approach suggests a preference for strong governmental coordination in AI oversight, potentially facilitating faster decision-making and unified policy implementation. The Hungarian model exemplifies this approach through its establishment of the Artificial Intelligence Council under the direct supervision of the Minister of National Economy, creating a consolidated institutional structure with comprehensive authority over AI oversight functions. Similarly, Poland's proposed Artificial Intelligence Development and Security Commission and Italy's designation of government agencies under the Presidency of the Council demonstrate variations of this centralized institutional design. However, this model also raises questions about the independence of oversight mechanisms, particularly given the AI Act's emphasis

on authorities exercising their powers "independently, impartially and without bias" (Article 70). The unified approach, interestingly, has only been adopted by EU institutions through the European Data Protection Supervisor (EDPS). This model combines both functions within a single independent authority, potentially offering clearer lines of accountability and more streamlined operations. However, its limited adoption by Member States might suggest practical challenges in implementing this approach at the national level, where existing regulatory landscapes are more complex, the market presents more AI systems for market surveillance activities, and robust capacity in AI is needed, notably towards the need for public acceptance (Middleton, 2022). The predominant avoidance of this model by early implementing Member States indicates significant practical barriers, potentially including resource constraints, institutional path dependencies, and challenge in developing the multidimensional expertise necessary for comprehensive AI oversight within a single independent regulatory entity. The fragmented approach emerges as the predominant choice among early implementers, with countries like Finland, Lithuania, Luxembourg, and Malta adopting various mixed models. Within this landscape, institutional arrangements vary from moderately distributed (e.g., Lithuania's dual-agency model) to highly complex configurations (e.g., Luxembourg's eight-authority framework). The distributed approach operationalizes theoretical insights regarding the diversity of expertise necessary for effective technology governance, acknowledging that different regulatory domains require distinct forms of specialized knowledge that may not be readily consolidated within singular institutional structures. This organizational fragmentation potentially enhances the depth of domain-specific understanding but simultaneously creates significant coordination burdens and risks of inconsistent implementation across regulatory domains. Luxembourg's implementation particularly exemplifies this approach, with multiple sectoral authorities sharing market surveillance responsibilities while maintaining the National Commission for Data Protection as a horizontal coordinator. Similarly, Lithuania combines a government agency for notification with an independent authority for market surveillance. This approach potentially leverages existing expertise across different domains – that requires developing a nuanced understanding of a highly complex policy landscape (Margetts, 2024) – but may face increased administrative complexity and coordination challenges (Mikhaylov, 2018). The prevalence of the fragmented approach among early implementers might indicate a pragmatic response to the AI Act's comprehensive requirements. By distributing responsibilities across existing bodies, Member States can potentially meet the August 2025 deadline while leveraging established regulatory expertise. However, this choice also reflects the complexity of AI governance, where different aspects of oversight may require distinct types of regulatory approaches and expertise (Choi, 2023). These early implementation patterns also reveal an important tension between the need for coordinated AI oversight and the practical advantages of distributed regulatory responsibility. While centralized approaches might offer more straightforward coordination, fragmented implementations might better address the multifaceted nature of AI regulation, from technical standards to market surveillance duties.

5.2 Institutional continuity vs. new bodies

The results also reveal a clear dichotomy in institutional approaches to AI oversight, with most Member States opting to leverage existing regulatory bodies while only a few create new AI-specific institutions. This pattern offers important insights into different strategies for building AI governance capacity. The majority of early implementing states have chosen to adapt and expand the mandates of existing institutions. Finland distributed oversight responsibilities across established regulatory bodies in various sectors, while Luxembourg designated existing authorities like the Institute for Standardization, Accreditation, Safety and Quality of Products and Services and National Data Protection Commission for different aspects of AI oversight. Similarly, Italy appointed its National Cybersecurity Agency and Agency for Digital Italy, while Malta leveraged the existence of its Digital Innovation Authority and the Data Protection Commission. This approach suggests a pragmatic strategy that capitalizes on established regulatory expertise and existing strong institutional frameworks (Winfield, 2018). It may also reflect practical considerations regarding the ambitious implementation timeline, as creating entirely new institutions by August 2025 could present significant organizational challenges. In contrast, Hungary and Poland have opted to establish new AI-specific bodies. Hungary's creation of a dedicated AI Council and Poland's proposed Artificial Intelligence Development and Security Commission represent a more transformative approach to AI governance. These new institutions might offer advantages in terms of specialized focus and clear mandate, but they also face the challenge of building regulatory capacity and expertise from the ground up. The choice to create new bodies might reflect these countries' vision of AI oversight as a distinct regulatory domain requiring dedicated institutional frameworks rather than an extension of existing regulatory functions, highlighting the tension in diverse AI public management and organization (Selten, 2024). This approach acknowledges that effective AI oversight requires diverse forms of what may already exist within established regulatory frameworks. Moreover, building on existing institutions might facilitate faster operational capability and more efficient resource utilization, particularly important given the comprehensive expertise requirements outlined in Article 70(3) of the AI Act. However, the institutional continuity approach also presents potential challenges. Existing bodies may need significant adaptation to handle AI-specific oversight responsibilities, and there might be risks of institutional path dependency (Chiodo, 2024), limiting the development of novel regulatory approaches needed for AI governance. Conversely, while new AI-specific bodies might offer more flexibility in developing tailored oversight mechanisms, they face the substantial challenge of building institutional capacity and expertise within a limited timeframe. This institutional design dichotomy reflects deeper theoretical questions regarding the nature of effective technology governance - specifically, whether novel technological systems like artificial intelligence represent extensions of

existing regulatory domains requiring evolutionary adaptation or fundamentally different governance challenges necessitating revolutionary institutional transformation. The empirical evidence from early implementation patterns suggests that most jurisdictions have adopted the former perspective, conceptualizing AI governance as an extension of existing regulatory domains that can be effectively addressed through institutional adaptation rather than creation.

5.3 Vertical vs. horizontal oversight

Finally, the examination of Member States' implementation choices highlights a critical divide between comprehensive and domain-specific regulatory architectures for AI oversight, each reflecting distinct philosophies about effective AI governance. At one end of the spectrum lies the vertical and domain-specific model, with Finland and Luxembourg as prime examples of jurisdictions embracing specialized regulatory frameworks. The Finnish implementation distributes competencies across multiple domain experts, from transport regulators to healthcare authorities, while Luxembourg's framework carefully delineates oversight based on sector-specific expertise. This granular approach stems from an understanding that AI systems pose distinct challenges depending on the application context (Alhosani, 2024), demanding tailored oversight mechanisms. Standing in stark contrast is the comprehensive oversight model, epitomized by Hungary and Poland's approaches through their dedicated AI authorities. By establishing single entities with broad supervisory mandates, these Member States prioritize unified governance over sector-specific considerations. Their implementation strategy suggests a conception of AI oversight as fundamentally cross-cutting, requiring coordinated supervision that transcends traditional regulatory boundaries (Taeihagh, 2021). This fundamental divergence in regulatory architecture carries significant implications. The domain-specific model offers the advantage of nuanced, context-aware supervision but risks creating regulatory silos and inconsistent interpretation of AI Act requirements. Meanwhile, comprehensive oversight promises more uniform implementation but may struggle to address the technical intricacies and operational specificities of different sectors. Some jurisdictions are developing hybridized frameworks that attempt synthetic reconciliation of these competing architectural principles (e.g. Cyprus, Malta). Though empirical validation of this approach's effectiveness remains pending, its theoretical framework suggests potential for balancing competing regulatory imperatives. This balanced framework might offer valuable insights for other Member States still formulating their implementation strategies, though its practical effectiveness remains to be evaluated. The emergence of these architectural variations demonstrates the complex multidimensionality of AI governance, requiring institutional frameworks capable of simultaneously addressing cross-cutting principles and sector-specific requirements The diversity of architectonic approaches among early-implementing Member States illuminates the fundamental governance challenge of balancing systemic coherence with contextual adaptability, revealing tensions between implementation uniformity and calibration that persist across diverse administrative contexts.

6. Conclusion

Our analysis of early implementation approaches to the EU AI Act's requirements for national competent authorities reveals fundamental dimensions that characterize distinct regulatory strategies. First, regarding organizational architecture, while most EU countries have yet to designate their competent authorities, early implementers show a clear pattern. The fragmented approach emerges as predominant, with countries like Finland, Lithuania, Luxembourg, and Malta distributing responsibilities across multiple bodies. In contrast, Hungary, Italy, and Poland opted for more centralized models, while the unified approach has been primarily adopted only at the EU institutional level through the EDPS. The predominance of fragmented approaches among early implementers suggests a pragmatic recognition of AI's complex, multi-faceted nature and the diverse expertise required for effective oversight. While this distributed model leverages specialized knowledge across different domains, it also introduces significant coordination challenges that Member States must address through careful institutional design. Second, our analysis reveals a strong preference for leveraging existing regulatory bodies over establishing new AI-specific institutions. Most early implementing states, including Finland, Luxembourg, Malta, and Italy, chose to expand the mandates of established authorities, likely capitalizing on existing expertise and institutional frameworks. Only Hungary and Poland opted to create new dedicated AI oversight bodies, highlighting different philosophies about building regulatory capacity. The strong preference for leveraging existing regulatory bodies over creating new AI-specific institutions reflects both practical and strategic considerations. This approach allows Member States to build on established expertise and operational capabilities, potentially facilitating faster implementation given the AI Act's ambitious timeline. However, this choice also raises questions about whether traditional regulatory frameworks can adequately adapt to the unique challenges of AI oversight. Third, we observed a critical divide between comprehensive and domain-specific oversight frameworks. While some jurisdictions like Finland and Luxembourg embraced specialized regulatory frameworks across different sectors, others like Hungary and Poland prioritized unified governance through broad supervisory mandates. Notably, some states are pioneering hybrid solutions that attempt to balance specialized knowledge with coordinated supervision. The tension between sectoral and horizontal oversight models emerges as a critical challenge in institutional design. While sector-specific approaches offer deeper domain expertise and contextual understanding, they risk creating regulatory fragmentation and inconsistent interpretation of AI Act requirements. Conversely, comprehensive oversight models promise more uniform implementation but may struggle to address

sector-specific technical complexities. Early implementing states' diverse approaches to resolving this tension provide valuable insights for other Member States still formulating their implementation strategies. Looking forward, these early implementation choices may have lasting implications for the effectiveness of AI oversight in Europe. The institutional architecture being established now will likely shape how Member States approach future challenges in AI governance, from ensuring consistent interpretation of requirements to fostering innovation while maintaining adequate oversight. Moreover, these diverse approaches to implementing the AI Act may offer valuable lessons for other jurisdictions worldwide as they develop their own AI governance frameworks.

Several important limitations of this study should be acknowledged. Our analysis focuses on early implementing Member States during the initial months following the AI Act's entry into force, capturing only the first wave of implementation approaches. This temporal limitation, while providing valuable early insights, means our findings may not fully reflect the complete landscape of implementation strategies that will emerge as more Member States designate their competent authorities. Additionally, our analysis relies primarily on formal documents and legislative proposals rather than operational evidence, as these authorities are not yet fully functioning. These limitations point to important directions for future research. First, longitudinal studies tracking the evolution of these different regulatory models would provide valuable insights into their effectiveness and adaptability over time. As Member States operationalize their institutional frameworks and develop practical coordination mechanisms, comparative assessment of regulatory outcomes would illuminate how different structural arrangements influence governance effectiveness. Second, comparative governance studies across technological domains would enhance understanding of whether findings from AI governance extend to other emerging technologies. Research examining institutional arrangements for quantum computing, biotechnology, or autonomous systems governance could identify common patterns and distinctive challenges, potentially revealing domain-specific factors that influence optimal institutional design. Third, research examining stakeholder perspectives, including industry actors and civil society, would enhance understanding of how different institutional arrangements impact innovation and public trust in AI governance. Empirical assessment of coordination mechanisms between market surveillance authorities, notifying bodies, and sectoral regulators would address a critical gap in current understanding. Future research could examine information flows, decision-making processes, and procedural integration across institutional boundaries, potentially identifying best practices for effective coordination despite structural fragmentation. Finally, future studies should investigate how these different models perform in practice, particularly regarding their ability to meet the AI Act's requirements for expertise, independence, and effective oversight. This could include examining coordination mechanisms in fragmented systems, capacity building in new institutions, and the effectiveness of different approaches to balancing sectoral expertise with comprehensive oversight.

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References

1. Alhosani, K., Alhashmi, S. M. (2024). Opportunities, challenges, and benefits of AI innovation in government services: a review. *Discov Artif Intell 4, 18.* https://doi.org/10.1007/s44163-024-00111-w
2. Bellogín, A., Grau, O., Larsson, S., Schimpf, G., Sengupta, B., & Solmaz, G. (2024). The EU AI Act and the Wager on Trustworthy AI. *Communications of the ACM, 67(12), 58-65*. https://doi.org/10.1145/3665322
3. Bianchi, C., Nasi, G., Rivenbark, W. (2021). Implementing collaborative governance: models, experiences, and challenges. *Public Management Review. 23. 1-9.* https://doi.org/10.1080/14719037.2021.1878777
4. Cancela-Outeda, C. (2024). The EU's AI act: A framework for collaborative governance. *Internet of Things, Volume 27, 101291, ISSN 2542-6605*. https://doi.org/10.1016/j.iot.2024.101291

5. Chiodo, M., Müller, D., & Sienknecht, M. (2024). Educating AI developers to prevent harmful path dependency in AI resort-to-force decision making. *Australian Journal of International Affairs*, *78(2), 210–219*.
https://doi.org/10.1080/10357718.2024.2327366
6. Choi, H., Park, M. J. (2023). To govern or be governed: an integrated framework for AI governance in the public sector, *Science and Public Policy*, *Volume 50, Issue 6, Pages 1059–1072*
https://doi.org/10.1093/scipol/scad045
7. Dwivedi, Y. K., et al. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management.*
https://doi.org/10.1016/j.ijinfomgt.2019.08.002
8. Feijóo, C., et al. (2020). Harnessing artificial intelligence (AI) to increase wellbeing for all: The case for a new technology diplomacy. *Telecommunications Policy, Volume 44, Issue 6*.
https://doi.org/10.1016/j.telpol.2020.101988
9. Fountain, J. E. (2001). Building the Virtual State: Information Technology and Institutional Change. *Brookings Institution Press*.
10. Gasser, U. and Almeida, V. A. F. (2017). A Layered Model for AI Governance. *IEEE Internet Computing*, vol. 21, no. 6, pp. 58-62, November/December 2017
https://doi.org/10.1109/MIC.2017.4180835
11. Government's bill n. TEM050:00 of 2024 (Finland). Government proposal to Parliament for legislation supplementing the EU Regulation on Artificial Intelligence. Accessed in January 2025.
https://api.hankeikkuna.fi/asiakirjat/0904a749-72c4-4301-8e13-85bad0a85062/8ce02987-9aa4-4187-9226-d012024bc47a/LAUSUNTOPYYNTO_20241028083630.PDF
12. Government bill n. UC71 of 2024 (Poland). Draft Act on Artificial Intelligence Systems. Accessed in January 2025.
https://www.gov.pl/web/premier/projekt-ustawy-o-systemach-sztucznej-inteligencji#:~:text=Organem%20w%C5%82a%C5%9Bciwym%20w%20tym%20zakresie,skargowe%20zako%C5%84czone%20b%C4%99dzie%20wydaniem%20decyzji
13. Government resolution n. 1301/2024 (Hungary). Government Resolution 1301/2024 (IX. 30.) on measures necessary for the implementation of the Regulation of the European Parliament and of the Council on artificial intelligence. Accessed in January 2025.
https://njt.hu/jogszabaly/2024-1301-30-22
14. Government resolution n. 860 of 2024 (Lithuania). Resolution on amendment of articles 1, 2, 11, 13, 14, 17, 21 of the law of the republic of Lithuania on technology and innovations no. xiii-1414 and supplementation of the law by the draft law and law of the republic of Lithuania on information society services no. x-614 submission of the draft law on amendment of articles 1, 2, 23 and the annex to the Seimus of the republic of Lithuania. Accessed in January 2025.
https://www.e-tar.lt/portal/lt/legalAct/ca88ddf38c7e11ef92b19bb92dd76d17
15. Laux, J., Wachter, S., Mittelstadt, B. (2023). Trustworthy artificial intelligence and the European Union AI act: On the conflation of trustworthiness and acceptability of risk. *Regulation & Governance 18, 3–32*
https://doi.org/10.1111/rego.12512
16. Lu Q., Zhu L., Xu X., Whittle J., Zowghi, D., Jacquet A. (2024). Responsible AI Pattern Catalogue: A Collection of Best Practices for AI Governance and Engineering. *ACM Comput. Surv. 56, 7, Article 173 (July 2024), 35 pages*.
https://doi.org/10.1145/3626234
17. Mikhaylov, S. J., Esteve, M., and Campion, A. (2018). Artificial intelligence for the public sector: opportunities and challenges of cross-sector collaboration. *Phil. Trans. R. Soc. A.37620170357*
http://doi.org/10.1098/rsta.2017.0357
18. Margetts, H., Dorobantu, C. and Bright, J. (2024), How to Build Progressive Public Services with Data Science and Artificial Intelligence. *The Political Quarterly, 95: 653-662*.
https://doi.org/10.1111/1467-923X.13448
19. Medaglia, R., Mikalef, P. and Tangi, L., European Commission: Joint Research Centre. (2024) Competences and governance practices for artificial intelligence in the public sector. *Publications Office of the European Union, Luxembourg, 2024*
https://data.europa.eu/doi/10.2760/7895569
20. Middleton, S. E., Letouzé, E., Hossaini, A. and Chapman, A. (2022). Trust, regulation, and human-in-the-loop AI: within the European region. *Commun. ACM 65, 4 (April 2022), 64–68*.
https://doi.org/10.1145/3511597
21. Novelli, C., Hacker, P., Morley, J., Trondal, J., & Floridi, L. (2024). A robust governance for the AI act: AI office, AI Board, scientific panel, and national authorities. *European Journal of Risk Regulation*, 1-25. https://doi.org/10.1017/err.2024.57
22. Parliament bill n. 8476 of 2024 (Luxembourg). Draft law implementing certain provisions of Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 establishing harmonized rules concerning artificial intelligence. Accessed in January 2025.

https://wdocs-pub.chd.lu/docs/exped/0150/154/301543.pdf
23. Regulation (EU) 2024/1689 of the European Parliament and of the Council. Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828 (Artificial Intelligence Act). https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401689
24. Selten, F., Klievink, B. (2024). Organizing public sector AI adoption: Navigating between separation and integration. *Government Information Quarterly, Volume 41, Issue 1, 101885, ISSN 0740-624X.* https://doi.org/10.1016/j.giq.2023.101885
25. Senate Bill n. 1146 of 2024 (Italy). Provisions and delegation to the Government regarding artificial intelligence. Accessed in January 2025. https://www.senato.it/service/PDF/PDFServer/BGT/01418921.pdf
26. Shao, Z., Yuan, S. and Wang, Y. (2020). Institutional Collaboration and Competition in Artificial Intelligence. *IEEE Access, vol. 8, pp. 69734-69741.* https://doi.org/10.1109/ACCESS.2020.2986383
27. Taeihagh, A. (2021). Governance of artificial intelligence. *Policy and Society, 40(2), 137–157*. https://doi.org/10.1080/14494035.2021.1928377
28. Winfield, A. F. T., Jirotka, M. (2018). Ethical governance is essential to building trust in robotics and artificial intelligence systems. *Phil. Trans. R. Soc. A.37620180085* http://doi.org/10.1098/rsta.2018.0085
29. Zaidan, E., Ibrahim, I. A. (2024). AI Governance in a Complex and Rapidly Changing Regulatory Landscape: A Global Perspective. *Humanit Soc Sci Commun 11, 1121.* https://doi.org/10.1057/s41599-024-03560-x