Interoperability Governance: A Definition and Insights from Case Studies in Europe

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ABSTRACT¹

Interoperability has become a crucial value in European e-government developments, as promoted by the Digital Single Market strategy and the Tallinn Declaration. The European Union and its Member States have made considerable investments in improving the understanding of interoperability and in developing interoperable building blocks to support cross-border data exchange and public service provisioning. This includes recent updates of the European Interoperability Framework (EIF) and European Interoperability Reference Architecture (EIRA), as well as the publication of a number of generic and domain specific architecture and solutions building blocks such as digital identification or electronic delivery services. While in the previous version of the EIF, interoperability governance was not clearly developed, the new version of 2017 puts interoperability governance as a concept that spans across the different interoperability layers (legal, organizational, semantic and technical) and that builds the frame for interoperability overall. In this paper, we develop a definition of interoperability governance from a literature review and we put forward a model to investigate interoperability governance models at European and Member State levels. Based on several case studies of EU institutions and Member States, we could draw recommendations for what the key aspects of interoperability governance are to successfully diffuse interoperability into public service provisioning.

CSS Concepts

• Social and professional topics~Government technology policy

KEYWORDS

Interoperability governance, interoperability, governance models

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1 INTRODUCTION

Interoperability in the context of e-government is studied in academia and in practice for more than 15 years. Numerous publications elaborate aspects of interoperability – e.g. [1], [2], [3].

The European Commission (EC) puts considerable efforts in establishing and diffusing interoperability for more than two decades [2]. Most prominent examples are the EC's interoperability definition, the European Interoperability Framework (EIF) [4], and the European Interoperability Reference Architecture (EIRA) [5]. In the EIF, interoperability is defined as "*the ability of organizations to interact towards mutually beneficial goals, involving the sharing of information and knowledge between these organizations, through the business processes they support, by means of the exchange of data between their ICT systems*" [4].

In order to achieve 'mutually beneficial goals' through interoperability, different organizations need to work effectively together towards these goals. Yet as Saekow & Boonmee argue in their study, the heterogeneous landscape of involved agencies represents big challenges of interoperability. In particular, they depict the nature of bureaucracy, the adoption of standards and the use of meaningful success measures as challenges underlying interoperability, never being sure that other agencies will follow a specific approach [6, p. 403]. To counteract these challenges, interoperability governance has emerged as a promising concept.

In the EIF version of 2010, interoperability governance was initially introduced as a concept [7], which was rather vague with no clear definition and no separation from the concept of organizational interoperability.

The recent EIF version of 2017 defines interoperability governance as "decisions on interoperability frameworks, institutional arrangements, organizational structures, roles and responsibilities, policies, agreements and other aspects of ensuring and monitoring interoperability at national and EU levels" [4]. To ground such an understanding and to gather an overview of what interoperability governance models are employed in different European institutions and Member State systems, this article aims

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to first provide foundations for a clear understanding of interoperability governance. Subsequently, we present findings from studying different interoperability governance models of European policy domains and European countries.

The structure of the paper is as follows: Section 2 provides a review of different forms and scopes of governance and concludes with a definition of interoperability governance. Section 3 develops a template to study interoperability governance models in a comparative manner, which serves as the basis for the case studies. Section 4 introduces the research design and selection of cases. It also documents one case study from the Netherlands. Subsequently, a synthesis of further case studies and insights into common governance elements is provided in section 5. We conclude the paper in section 6 by identifying core elements of effective governance structures and ways to involve relevant stakeholder groups.

2 DEFINING INTEROPERABILITY GOVERNANCE: A LITERATURE REVIEW

To develop a clear understanding of the role of governance in the context of interoperability, the understanding of governance needs to be elaborated first. A well-known understanding of governance and its role is at the corporate level, where corporate governance embraces *"the set of processes, customs, policies, laws and institutions affecting the way a corporation is directed, administered or controlled"* [8]. Kooper et al as well as an OECD study on principles of corporate governance argue that corporate governance also caters for the relationships among stakeholders. It provides the structures and functions to align organizational objectives with the implementations and the monitoring functions to control whether objectives are achieved [8] [9]. Along this understanding, Weill and Ross distinguish governance and management functions as follows: the first refers to *"what decisions must be made to ensure effective management and use of IT (decision domains) and who makes the decisions (locus of accountability for decision-making); [the latter] involves making and implementing decisions"* [10].

With the digitalization, the term IT governance was coined and referred to as *"the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives"* [11]. IT governance has therefore become a crucial instrument to align IT investments with the strategic business objectives [8]. However, IT governance must not be interpreted too narrowly, as interoperability as a shared value is by no means only a technical aspect. Taking a more holistic view on online public service provisioning (see e.g. [12]), applying enterprise architecture frameworks in information systems development (see e.g. [13], [14], [15], [16], [17]) has become crucial as such frameworks aim at integrating and aligning in a comprehensive way different views on an enterprise and how its actors interact in cross-organizational settings. Yet, enterprise architecture frameworks do in general not comprise the functions of governance as explicated in above definitions. Furthermore, they are mostly targeting public service provisioning.

Along the lines of above understandings, different governance functions can be identified to promote and diffuse interoperability, and to overcome the existing vagueness and confusion of the role of governance in regard to interoperability. We take into account that specific forms of governance have emerged in the past decade, e.g. data governance [18] and information governance [8]. We extend the understanding of governance towards a wider set of stakeholders in the context of interoperability. To this end, we define interoperability governance as a governance, which provides the enabling framework, processes, managerial and steering functions such as reference architecture and support instruments for decision making. The EIF and the EIRA are prominent examples of such interoperability governance instruments.

Interoperability governance as defined before supports public service provisioning by providing and managing generic interoperability enablers (i.e. the concepts such as 'regulation', 'collaborative business process', 'semantic data model') and artefacts (the concrete instantiations of enablers that can be applied to / employed in public service provisioning) at the different interoperability layers (legal, organizational, semantic and technical according to the EIF [4]). Interoperability governance also ensures that interoperability enablers and artefacts are aligned with the overall interoperability objectives at policy level (e.g. the Digital Single Market² and Tallinn Declaration³). Finally, interoperability governance caters for change management and assures the sustainability of existing and new interoperability enablers, artefacts and supportive measures. By supportive measures we refer to the development and diffusion of a body of knowledge on interoperability, and the provision of the necessary repositories for sharing and reusing interoperability artefacts.

Interoperability governance functions need to be integrated in the instantiations of public services to align strategic interoperability objectives with the concrete implementations of interoperability solutions in end-to-end public services within and across policy domains. Such functions should naturally be part of well-established project management, architecture and governance frameworks.

The above understanding of interoperability governance was the basis for a set of case studies performed in the past two years. Before introducing the case studies, we present the analysis and model templates for the study of interoperability governance models.

3 MODEL TEMPLATE FOR INTEROPERABILITY GOVERNANCE

At the beginning of the study, a template as shown in Figure 1 was developed to study interoperability governance models in an effective way. The model template depicts the main characteristics of an existing interoperability governance model, incorporating the following aspects:

- Level at which an actor performs governance functions (political, strategic, tactical, operational – see below);
- Role types and main responsibilities of each identified institution and/or specific role;
- Relationships among different actors;

² https://ec.europa.eu/commission/priorities/digital-single-market_en

³ <https://ec.europa.eu/digital-single-market/en/news/ministerial-declaration-government-tallinn-declaration>

- Relation with other relevant policy initiatives or programs to highlight interdependencies.

The levels at which an actor may perform governance functions represent an adaptation of the multi-level approach to transition management (strategic, tactical and operational) as defined by Loorbach and colleagues in [19] and [20]. This approach is extended by adding a political level because, in the public sector - unlike in the private sector, the division between legislative power of political actors and administrative power of public institutions has to be taken into consideration. The **political level** indicates the high-level governance functions, which political and legislative actors execute. In this sense, the political level precedes the strategic level and provides overall long term decisions, leadership and commitment to strategic visions, which all set the direction for the governance functions at the other levels.

The **strategic level** maps actors and governance processes that determine how to best transfer political decisions into practice. The borders with the political level are not always very strict, apart from the political level decision-making versus the executive strand of

decision-making. Thus, strategic level actors may prepare strategic visions and policy documents for the political level as well as make strategic decisions for the further implementation of policy objectives, which the political level decides.

At the **tactical level**, relevant actors cater for more implementation-oriented planning activities such as developing standards or coordinating their widespread application. These actors and their activities are strongly dependent on the strategic level governance and decisions. This level's actors also comprise governance functions to guide the operational layer in e.g. the usage of and feedback on interoperability artefacts in public service provisioning, or in developing and providing the necessary tools and knowledge to support the operational level.

In this taxonomy, the **operational level** covers the actors responsible for the provision of public services or interoperability building blocks. This understanding also confers to Loorbach's understanding of executing projects and performing experimentation

Figure 1: Model template for governance models

The model template reflects also the generic understanding of strategic planning processes from economics and management literature⁴.

The role types and main responsibilities depict on each level of governance the core actors (institutions such as Ministries, Directorates, Networks of different actors; roles such as CIO, Minister, Director, Chancellor, etc.) that perform relevant governance functions (described in the note shapes linked to the boxes with the institutions' names). Furthermore, dotted lines and arrows visualise the relationships among different actors within, and across, governance levels. They also indicate a hierarchy in the collaborative governance model in combination with the levels at which an actor may perform governance functions. Furthermore, the schema indicates interdependencies or relationships with other relevant policy initiatives or programs through rounded edge rectangles outside a core governance model.

Relevant artefacts scoping the respective governance model are listed underneath the governance model to document the base of a specific governance model. Such artefacts can be strategic policy documents, legal frameworks, funding programs, interoperability frameworks or other guiding documents. These documents were also the main sources of information in the case studies.

The graphical representations of governance models are complemented with textual descriptions and explanations of governance actors and their roles as well as relations among each other at the different transition levels.

In the next section, we apply the introduced concept to different case studies.

4 CASE STUDIES ON INTEROPERABILITY GOVERNANCE

To test the model introduced in section 3, extensive desk research with qualitative case study research [21], [22] has been carried out in 2016 and 2017 to study governance models at European Commission and Member State levels tackling interoperability. The team held regular meetings, both physical and virtual, to elaborate the case studies and to synthesize the relevant insights.

In the following subsection, the selection of the case studies is explained. Next, an interoperability governance model is outlined.

4.1 Selection of case studies

The research team selected a total of three European domains and thirteen European countries for the case studies.

The three European domains were selected on the basis of high-priority EU policy domains and access to the necessary information: interoperability program of the ISA unit⁵, e-procurement digital service infrastructure⁶ and e-health network digital service infrastructure⁷. The three domains reflect distinct

examples of interoperability governance: two more strictly European institutional (ISA² and e-procurement) and one less institutionalised example (e-health).

The thirteen selected European countries are Austria, Belgium, Bulgaria, Denmark, France, Germany, Italy, Lithuania, Netherlands, Norway, Poland, Portugal and Spain. The countries were selected in two iterations, with selection criteria based on distinct characteristics such as size of countries (large, medium, small population), constitutional systems (central or federal), following EU guidance more strictly or going their own way, top-down enforcement or engaging key actors in collaborative platforms.

In the next subsections (due to space limitation), a model of interoperability governance is presented from the Netherlands, a mid-size, centrally organized country⁸.

4.2 Interoperability governance in the Netherlands

In regard to e-government developments, and in particular concerning interoperability developments, the Netherlands is among the leading countries. The interoperability governance model involves multiple collaborating actors – see Figure 2. The Ministry of the Interior and Kingdom Relations, the Central Government Sector and the Ministry of Economic Affairs collaborate with the Digi-Commissioner, who is responsible for implementing the Generic Digital Infrastructure (GDI), the corner stone of the digital basic services. He chairs the National Council Digital Government, which manages the GDI Program and implementation. The National Council further oversees the four Directing boards (Data management, Interconnectivity, Service Provisioning, Authentication & Identification), which work on strategic, tactical and operational levels. Finally, two bodies, Government ICT Unit (ICTU) on tactical level and the Logius on operational level help the government in developing and maintaining ICT tools and implement the strategic objectives of the government.

In the Netherlands, the consulting group “Citizens and Businesses” represents stakeholders. Different end user industry representatives are involved in this group. The main purpose is to keep in touch with the end users and to evaluate topics for security, reliability and simplicity.

The Netherlands governance model builds on strong collaboration ties among responsible centralized government actors and involvement of regional and local level actors as well as citizen and business groups. While being a mid-size country, the governance model is not a simple top-down structure. Through the involvement of stakeholders representing the end user perspectives, the evaluation and feedback loop is an asset that other Member States with similar structures could adopt.

The Government-wide implementation agenda⁹ for digital services in 2017 scopes Netherlands's governance. The agenda

⁴ See a comparison of literature in [23], where strategic planning refers to long-term planning processes, tactical planning covers mid-term coordinating and planning activities to realize the strategic objectives, and operational refers to short-term and realization of plans in concrete projects to achieve strategic objectives.

⁵ Decision (EU) 2015/2240 establishing a program on interoperability solutions and common frameworks for European public administrations, businesses and citizens (ISA² program) as a means for modernizing the public sector, see <http://data.europa.eu/eli/dec/2015/2240/oj>

⁶ Decision (EU) 1316/2013 establishing the Connecting Europe Facility, see <http://data.europa.eu/eli/reg/2013/1316/oj>

⁷ Directive 2011/24/EU on the application of patients' rights in cross-border healthcare, see <http://data.europa.eu/eli/dir/2011/24/oj>, and 2011/890/EU Commission Implementing Decision, http://data.europa.eu/eli/dec_impl/2011/890/oj, and e-health CEF digital service infrastructure, see <https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/2017/05/30/eHealth>

⁸ The size categorisation reflects the population.

⁹ <http://www.digitaleoverheid.nl/digitaal-2017/implementatieagenda>

aims to contribute to better (digital) services for citizens and businesses. It outlines the means and ways to achieve an accessible digital government to satisfy the coalition agreement of 2012. The

latter stipulates that citizens and businesses should be able to deal digitally with the government by 2017.¹⁰

Figure 2: Interoperability governance model in the Netherlands

The implementation agenda spots three types of implementation activities:

Activities aimed at providing digital services from the perspective of citizens, businesses and other organizations and their use (Service agenda);

- Activities aimed at advancing and improving the (consistency of) generic digital infrastructure to make possible the provision of digital services (Building block agenda);
- Activities directed at connecting government organizations through the generic digital infrastructure building blocks (Connectivity agenda).

These activities can differ per government level. They express the need of interoperability and the need of deploying agreed and implemented standards.

Another important document shaping the Netherlands interoperability governance is the 'Governance, management and development of NORA' Guideline.¹¹ It outlines the governance model of management and development of the Dutch Government Reference Architecture (NORA). Finally, the document 'The Netherlands - National Commissioner for Digital Government' (Digi-Commissioner)¹² describes the function of the digital commissioner.

The next section provides a short synthesis of other selected case studies on interoperability governance. The full report is accessible on Joinup¹³.

5 INTEROPERABILITY GOVERNANCE: SYNTHESIS OF MODELS

This section provides a synthesis of the main characteristics of selected governance models of the analyzed EC and Member States cases. The descriptions contain a brief summary of the governance model, whether stakeholders are involved in governance (if and how), and how the governance of the transition from strategic objectives to operational implementation of interoperability is realized.

5.1 Synthesis of EC governance models

The aim of the ISA² program is to facilitate efficient and effective electronic cross-border interaction between European public administrations on the one hand, and between European public administrations and businesses and citizens on the other. These goals are achieved through:

¹⁰<http://www.digitaleoverheid.nl/digitaal-2017/implementatieagenda>

¹¹http://www.noraonline.nl/images/noraonline/9/97/Governance_beleef_en_doorontwikkeling_NORA.pdf

¹²<https://www.digicommissaris.nl/page/828/factsheet-national-commissioner-digital-infrastructure-pdf>

¹³ <https://joinup.ec.europa.eu/>

- Support in the identification, development, creation and operation of interoperable digital solutions that enable public administrations, businesses and citizens in Europe to benefit from interoperable cross-border and cross-sector public services and the implementation of Union policies and activities;
- Facilitation of the reuse of interoperability solutions by European public administrations.

The ISA² Committee is composed of appointed representatives of each Member State. It elaborates and reviews the working program, coordinates with complementary Union programs and provides opinions on draft implementing acts. It may establish working groups for elaborating particular issues. The ISA² Coordination group ensures a smooth coordination and collaboration between the working groups. In turn, the working groups report to the ISA² Committee. In this way, the full cycle that runs from the strategic to operational levels and back is clearly present.

The principle of delegating deliverables to the working groups, consisting of representatives from all Member States, allows for the division of the workload into manageable pieces. It also is a forum for Member States' representatives to share experiences of undertaking similar government activities, implementing regulations and coordinating stakeholders to achieve this.

The **e-procurement DSI** governance model emphasises stakeholder engagement from the European Commission, the Member States and expert communities. The European Commission has jurisdiction over this policy domain and is responsible for the Building Blocks that enable service provisioning. The Member States further transpose regulations and organizational structures as required. The role of the expert groups is to monitor and assess actual implementations as well as to provide feedback and support changes proposed by the Operational Management Boards. Stakeholders, therefore, are on a level playing field and fulfil a role that effectively influences technical solutions.

The link between strategic objectives and operational implementation is decentralized and is ensured in two ways:

- The dynamic governance model allows issues to be spotted quickly and to permanently assess the implementation.
- The involved bodies engage in mutual exchange of information across the different governance levels.

This governance model can, and is, emulated in other European settings. It is based on the Non-Paper on Governance of the CEF Building Block Digital Service Infrastructures (DSIs) published in joinup¹⁴.

The **eHealth Digital Service Infrastructure** governance model involves stakeholders through the eHealth Member State Expert Group, the Joint Action to Support the eHealth Network and the National Contact Points for eHealth. The active involvement of experts across different Member States asks them to contribute on strategic, tactical and operational levels. Their influence ranges from elaborating input that is delivered to the eHealth Network for

decision making purposes, over implementing and running the Cross-Border eHealth Information Services, and up to peer-to-peer evaluation of National Contact Points for eHealth.

Stakeholder engagement in the eHealth domain, thus, is indispensable for the eHealth Network to stipulate a shared vision, to make decisions and to drive forward the eHealth Digital Service Infrastructure.

This governance model allows stakeholders of the domain to create impact. While the model can be copied by Member States, it may be difficult to activate the same stakeholders on European and national level in other areas.

5.2 Synthesis of selected MS governance models

Below, a selection of Member State case studies is summarised.

The **Austrian** governance model is characterized by a comprehensive stakeholder engagement through the Platform Digital Austria. All political tiers from the federal to the municipal level contribute in working groups or the decision making bodies, such as the ICT Council and Federal-State-City-Municipality Cooperation (BLSG). This participation strengthens political commitment and adoption of solutions by public authorities in their respective regions.

The role of the Federal CIO is primarily one of a chairman and coordinator of the Platform Digital Austria, and political advisor to the Federal Chancellery, which provides technical solutions and drives the agenda for digitalization. Because representatives of municipalities, cities, states and the federal level are involved in the decision making process, they are able to swiftly ensure adoption within their jurisdictions. The governance model is shaped by inclusive stakeholder engagement of all political tiers and individual working groups. The latter elaborate and draft standards, which are agreed upon in the respective political tiers such as the body ICT Council or BLSG. The resulting ICT infrastructures are governed by the Federal Chancellery and administered by the Federal Computing Centre (BRZ).

In **Bulgaria**, the State e-Government Agency (SEGA) under the Ministry of Transport, Information Technology and Communications is the main responsible body for the interoperability governance on country level. It is in charge of coordinating the transition from strategic objectives to operational implementation. It is supported by two Councils – the Council for e-government on political level and the Council for administrative reform on strategic level. Part of the Council for e-government is the Business council, which includes stakeholders from the ICT industry.

In Bulgaria, similar to Lithuania and Poland, very few actors are responsible for ICT implementation and their roles are quite well defined. Having only a few bodies involved simplifies coordination. The ICT governance system is evidenced by the different dates of the establishment of the two supervisory Councils; the Council for e-government in 2011¹⁵ and the Council for administrative reform in 2009¹⁶, as well as the establishment of

¹⁴https://joinup.ec.europa.eu/sites/default/files/document/2016-03/09032016_cef_telecom_eg_non-paper_on_it_governance_of_cef_bb_dsis_-_updated_v7.00.pdf

¹⁵ Decree № 268 of 26 September 2011 on the establishment of the Council for Electronic governance, Sofia. URL: http://www.saveti.government.bg/c/document_library/get_file?p_l_id=74807&folderId=74813&name=DLFE-5559.pdf

¹⁶ Decree № 192 of the Council of Ministers of 5.08.2009 on the establishment of a Council for Administrative Reform, Sofia. URL: http://www.saveti.government.bg/c/document_library/get_file?p_l_id=1242&folderId=14248&name=DLFE-5497.pdf

SEGA in 2016. Therefore, there is not much legacy system in the governance of Bulgaria and possible best practices from other government systems were likely used to establish this type of governance. Medium to smaller countries could implement such a model to limit the bureaucracy in governance.

In **Denmark**, the main governance body behind interoperability governance is the Ministry of Finance, which implements the Prime Minister's agenda on a strategic level and is represented on tactical and operational levels by the Agency of Digitisation and the Agency for governmental ICT services. Furthermore, the Ministry of Finance collaborates with the Ministry of Industry, Business and Financial affairs and the Steering committee for joint-government cooperation (STS) on strategic level. The STS further represents stakeholders from different administrations; it also coordinates with the Municipalities and regions to obtain feedback.

The Agency of Digitisation, the Ministry of Industry, Business and Financial affairs and the Steering Committee ensure the transition of strategic objectives into operational implementation. The Local Government Denmark further consults and supports local administrations in delivering local services and developing local communities. As part of the Steering Committee, it also represents its stakeholders' opinions. Furthermore, while the decision-making in Denmark is centralized, advisory bodies, with the support of the Local Government Denmark and Municipalities and the Regions, prepare content in advance. This aids the successful implementation and contributes to greater coherence and standardization in the rollout of digital services.

In **France**, the decision making power on policies lies with the Prime Minister. He or she receives advice from the ICT Council and the National Digital Council as well as the Interministerial Directorate for Public Transformation (DITP) and the Interministerial Directorate for Information and Communication Systems (DINSIC). Stakeholder engagement, thus, is limited to the National Digital Council as the only advisory body that contributes outside perspectives from the private sector and the civil society. The ICT Council and the Secretariat-General for Government Modernisation, in contrast, aggregate the demands and perspective of the various departments in the federal administration without representation of the regions or cities in France. The Prime Minister, the State Secretary for Digital Affairs and the Minister of Public Action and Public Accounts are the actors with decisive influence on policy making and implementation in the domain of interoperability governance.

Nevertheless, transition of strategic objectives to operational implementation is ensured through different governance bodies: the Interministerial Directorate for Public Transformation (DITP), the Interministerial Directorate for Information and Communication Systems (DINSIC), the Interministerial Directorate for Information and Communication Systems and the Interministerial Directorate for Accompanying Public Transformations, which consult and support local administrations in implementing technical solutions based on the Common Strategic Framework. The governance approach in France, thus, is centralized in the hands of the Prime Minister.

In **Italy**, the Ministry for Simplification and Public Administration and the Agency for Digital Italy are the main bodies responsible for the interoperability governance on country level. They are responsible for the management of policies of public

administration and coordinate actions in the field of information and communication technologies. The Department for Civil Service supports the Ministry of Simplification and Public Administration on all governance levels. FORMEZ is responsible for developing ICT related training for the public sector staff.

The National Association of Italian Municipalities (ANCI) represents the stakeholders, i.e. Italian municipalities, and provides them with technical and political support. ANCI further supports them through their own service provider Ancitel. Furthermore, the Digital transformation team represents the different government and public administrations stakeholders.

The interoperability governance of Italy appears as a harmonious structure with multiple bodies on each governance levels, having defined activities, which are not part of a single Ministry. In addition, as the different agencies and departments have associated actors on operational level, they are likely to receive feedback, which serves as input to the strategy re-development cycle.

As a parliamentary republic, the Prime Minister is in charge of the interoperability governance in **Lithuania** on the political level. In the digitalization of the public sector, several bodies support the Prime Minister: the Ministry of Interior and its Public Administration Policy Department are responsible for e-government and e-services provision; the Ministry of Transport and Communication and its Information society development committee are responsible for coordination of e-government projects and supervision. On an operational level, these actors are supported by the ICT provider Infostruktura. The Association of Local authorities in Lithuania represents the interests of stakeholders, such as local authorities, and authorities of the state, foreign and international organizations. It collaborates with the Public Administration Policy Department.

In Lithuania, two Ministries share the e-government portfolio, which need to collaborate and have equal standing. While one is involved on all four governance levels through the Public Administration Policy Department, the other Ministry (Ministry of Transport and Communication) is mostly involved on the strategic and tactical levels and has a separate organization, responsible for the ICT. The role of Information society development committee is to strengthen political commitment and adoption of solutions by public authorities. These roles primarily involve administration of the e-service portal (e-gov gateway) and facilitation of e-inclusion as well as management of state registers and information systems.

With the Ministries being closely involved in all four governance layers, they have direct contact with stakeholders and are aware about how different initiatives are being implemented in practice. This way they can collect feedback from the practical side and use it into the strategic process. The only concern could be the lack of more stakeholder groups involved in e-government.

The interoperability governance model in **Portugal** is rather unique compared to other countries, as the main acting governance body is the Agency for Administrative Modernisation (AMA), and not a Ministry as in most countries. The AMA works under the Deputy Secretary of State and Administrative Modernisation and cooperates with the National Association of Portuguese Municipalities (ANMP) on a strategic level. Furthermore, it supports the Council for Information and Communication Technologies in Public Administration (CTIC) and is supported by

the Centre for the Management of Government Information Network (CEGER) on the operational level. The ANMP represents stakeholders of local and other public agencies in Portugal on the strategic level.

CTIC includes members among others from AMA, CEGER, the Portuguese Public Administration Shared Services Authority (ESPAP) and a Ministerial Representative from each area of Government. The CTIC helps not only setting up the ICT strategy, but also in monitoring the implementations taken by other entities.

5.3 Commonalities in interoperability governance models in Member States

Along the analysis of 13 country case studies, common elements (aggregated into types of governance bodies) in the different interoperability governance models were identified, which are depicted in Figure 3 along the four levels of governance. Ministries as well as Ministerial departments ('Departments') may be active on political, strategic and tactical levels. In some countries, the department is clearly indicated although this is not always the case. The position of Chief Information Officer (CIO) can be found in Austria, Germany and the Netherlands. Advisory boards and ICT boards can operate at both political and strategic levels. Examples include the Council for e-Government in Bulgaria on the political

level and the Information Society Advisory Board in Austria on the strategic level.

Public stakeholder groups represent and support local and regional bodies on e-government and interoperability at strategic, tactical and operational levels. Private stakeholders represent ICT industries, business and citizens at strategic and tactical levels. The Council of Ministers, or Cabinet, is the highest level of policy decision making body, or executive, in European countries at political level.

'Platform' above refers to the Platform Digital Austria (PDA), which, due to its uniqueness, has been left as platform, rather than being classified under public stakeholders or any other category. The ICT providers, which are present on both tactical and especially on operational levels, can be public and private bodies that support the public sector in implementing e-government policies. There are also four working groups, three on the tactical level (Italy, the Netherlands and Portugal) and one on the operational level (Austria). They typically support an ICT board or Advisory board. For example, in the Netherlands, the Directing Boards support the National Council for Digital Government.

Finally, the one private body in the figure above refers to the E-government Innovation Centre (EGIZ) in Austria, which is a research centre, supporting the Federal Chancellery in formulating its Federal ICT Strategy, and in developing innovations for the public sector.

Figure 3: Overview of common types of governance bodies tackling interoperability in thirteen European countries¹⁷

¹⁷ The number of bodies represent a snapshot at the time of writing the paper, it can change with time.

A key insight from the study is that there is no leading governance model for digitalization and interoperability; e-government development has no unique natural 'home'. Depending on the countries' different political structures, the main governance responsibility for e-government and interoperability may be with one single Ministry or dedicated Agency, or it may be dispersed among several agencies.

The study also unveiled that a multiplicity of public actors is involved in the interoperability governance models, such as agencies and regional authorities.

Often the Ministry responsible for e-government and interoperability is supported by a dedicated agency, which supports and continues its work on the strategic and tactical levels, e.g. the Agency for Digital Italy (AgID) in Italy or the Agency for Public Management and e-government (Difi) in Norway. Furthermore, in some countries the local and regional bodies are represented on tactical level by dedicated organizations, e.g. Local Government Denmark (LDGK) in Denmark or the National Association of Portuguese Municipalities (ANMP) in Portugal.

In fact, 10 out of the 13 countries analysed involve sub-national entities in their interoperability governance models, the exceptions being France, Bulgaria and Belgium. The case of Belgium is surprising; it is a highly federal state with strong federal entities, which are normally consulted on a wider range of policies in the context of the considerable "regionalisation" of competences that it has undergone over the last 40 years. Their absence from the Belgian interoperability governance model is arguably reflective of the reality for all countries that the area of e-government and digital affairs is a relatively new, and emerging national political priority.

All countries include civil stakeholders from the private sector and other non-commercial civil society organizations in their policymaking. This reflects that the area of e-government and digital affairs is a relatively new and dynamic domain for public administrations. Engagement with the private sector is important to ensure operational success of services and achieve policy objectives. The countries with the most mature structures to engage stakeholders are Denmark, Netherlands, and Spain. The private sector is involved in Austria, Belgium, France, the Netherlands, Norway and Spain.

6 CONCLUSIONS

In this paper, we studied the concept of interoperability governance and we presented case studies of governance models from different European countries and EC institutions. The case study research and resulting governance models are descriptive, i.e. they describe the characteristics of existing governance structures, the key roles and actors as well as the main governance functions in place in Member States that should ensure successful and effective implementation of interoperability in online public services. The research is also comparative by comparing Member State governance models and by drawing conclusions of good practices for effective governance of interoperability in public service provisioning.

As indicated in the previous section, there is no one model of interoperability governance that emerges from the analysis. The reviewed cases were different by their magnitude. The example

of the ISA² program shows how decentralization helps in implementation activities and in the achievement of the project/program goals. Limiting the number of governing bodies responsible for e-government and interoperability can ease the coordination between them (e.g. the Bulgarian or the Portuguese governance structures). In addition, centralizing the demands of administrative departments of the same administrative level can lead to economies of scale and the effective promotion of standardization (e.g. France). In a similar vein, empowering a dedicated agency (or a partner entity) to be responsible for the digital transformation of public administrations and the ICT governance in the country can simplify the governance in cases where this reduces bureaucracy and allows the agency to be closer to its stakeholders (e.g. Denmark, Portugal or Norway).

Effective interoperability governance needs to cater for a smooth transition of strategic objectives down to operational implementation at different government levels and in distinct state systems. The cases investigated show some valuable structures throughout the levels of governance, such as the feedback loop between bodies in the Netherlands. These should be thoroughly reflected in the revision or establishment of any comprehensive governance structures. On each of the levels, appropriate governance functions should be assigned to responsible roles. For example, a generic governance function on the strategic level is to develop the strategy and the digital standards for the government. This function continues on the tactical level by providing guidance on how to implement and apply this strategy, as well as to support public administrations. Thus, for effective and sustainable implementation of strategic interoperability objectives, a smooth communication and coordination (top-down and bottom-up) among the governing actors at different levels is of paramount importance.

An aspect not obviously visible in most governance structures is a systematic and structured monitoring procedure and feedback loop, such as the feedback loop between bodies in the Netherlands. This requires appropriate governance functions assigned to existing governance roles, which should be explicitly planned and assigned in interoperability governance.

From the synthesis, we suggest three further relevant bodies for interoperability governance:

- A *controlling body* with veto power on projects, which can help manage costs and ensure that investments stay within budgets (see e.g. Austria, ISA² Program).
- A *preparatory body for strategic decision making*, which can help speed up the process of addressing new issues and drafting solutions (e.g. eHealth DSI).
- A *public service provider* responsible for overseeing and maintaining important government infrastructure and digital services, which works closely with the responsible Ministry and serves all other Ministries and public agencies in the (central or federal) state (e.g. Austria, Belgium, Denmark, Norway).

The previous section identified common elements in e-government and interoperability governance. These include the presence of several sub-national actors and civil society stakeholders in addition to national bodies. A successful interoperability governance will cater for active stakeholder

involvement. Different ways of involving stakeholders were identified in the case studies, such as:

- *Expert groups* involved in the design of interoperable solutions and in supporting the decision making process (e.g. e-Procurement DSI, ISA² Program).
- *Working groups* engaging stakeholders of all levels to secure their buy-in (e.g. Austria (Working groups), Italy (Digital Transformation Team), Portugal (ICT Project Group (GPTIC)) and the Netherlands (the Directing Boards)).
- *Consulting groups* with end users, including representatives from the industry and citizens to monitor and advise on the policy and governance initiatives and implementation. Good examples of these are in Austria (Interest groups), Netherlands (Customer Boards and Consulting group “Citizens and Businesses”), Belgium (Digital Minds for Belgium), Spain (National Digital Confidence Forum and Professional Association of Higher Bodies of Information Systems and Technologies of the Public Administrations (ASTIC)), Norway (ICT Norway)).
- *National associations* representing the interests of regional and/or local administrations in the countries (e.g. Denmark (Local Government Denmark (LDGK)), Italy (National Association of Italian Municipalities (ANCI)), Lithuania (Association of Local Authorities in Lithuania (ALAL)), Norway (Norwegian Association of Local government and Regional authorities) and Portugal (National Association of Portuguese Municipalities (ANMP)).

These exemplary types of stakeholder engagement serve as good practices that can be realised in other Member States or at EC level. It is important that these engagement groups have appropriate influence on decision-making, design and implementation of interoperability solutions within the foreseen scope of their governance role. This ensures engagement and greater levels of adoption of solutions.

To conclude, this paper provides a definition of interoperability governance and draws insights into existing governance models at EU institutions and European countries. We identify several core components of governance models. The model template and the example can help other countries (not only in Europe) to study their own governance structures and to adjust these structures as needed to improve interoperability in public services. The model template can also be used in further research to investigate governance structures in other fields of digitalisation and in comparative research on interoperability governance. Future research could also study the effectiveness of such governance models in achieving interoperability in public service provisioning.

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