



LUND UNIVERSITY
School of Economics and Management
Department of Informatics

Implementing E-Invoicing in the European Union

An interpretive analysis of regulatory variation across Member States

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Authors: Sammy Benjari
Noah Liebrecht

Supervisor: Blerim Emruli

Grading Teachers: Paul Pierce, Sowdambika Baskaran

Implementing E-Invoicing in the European Union: An interpretive analysis of regulatory variation across Member States

AUTHORS: Sammy Benjari and Noah Liebrecht

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ABSTRACT (MAX. 200 WORDS):

Mandatory B2B e-invoicing is expanding across the EU under a shared harmonisation agenda, yet Member States have adopted substantially different governance arrangements for how invoices are exchanged, validated, and reported. This thesis investigates how regulation affects the implementation of mandatory B2B e-invoicing and how governance model variation shapes the conditions organisations face during that process. Drawing on document analysis of five Member States and five expert interviews, the study takes an interpretivist and abductive approach. The findings show that regulation is not external to implementation but embedded in it, enacted through format specifications, validation sequences, and transmission architectures. Governance model type shapes the enterprise integration challenge: Italy, France, Belgium, Hungary, and Germany each generate structurally different demands on ERP configuration, middleware, and operational compliance. The study contributes a comparative governance typology and shows that cross-jurisdictional implementation burdens cannot be explained without reference to governance model type, organisational maturity, and the temporal specification status of planned reporting obligations.

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1 Introduction

This chapter introduces the study and establishes its motivation. It begins with the background to mandatory B2B e-invoicing in the EU, before identifying the problem that existing research has not addressed. The purpose and research question are then stated, followed by a delimitation of the empirical and analytical scope.

Across the European Union, mandatory B2B e-invoicing is expanding under a shared harmonisation agenda, yet the governance arrangements through which Member States have implemented it remain substantially divergent. While the EU's common semantic standard and the VAT in the Digital Age initiative advance a coordinated regulatory direction, countries such as Italy, France, Belgium, Germany, and Hungary have each developed different transmission architectures, validation authorities, and reporting logics. For organisations operating across these jurisdictions, this divergence is not a matter of administrative detail. It translates into structurally different demands on enterprise systems, integration architectures, and compliance processes, differences that existing research has not fully explained. The European Commission (2024) documents that this variation has created interoperability problems and administrative burdens for businesses operating cross-border, with national Core Invoice Usage Specifications becoming a source of fragmentation rather than harmonisation even where the shared EN 16931 standard is formally adopted.

The scale of this change is substantial. Council Directive (EU) 2025/516 mandates structured electronic invoicing for all intra-EU B2B transactions by 2030, and Italy, France, Belgium, Germany, and Hungary have each introduced or are in the process of introducing domestic B2B mandates affecting significant portions of their taxable person populations. For enterprises operating across these jurisdictions, this creates a simultaneous compliance challenge of considerable complexity. Different mandatory formats, different transmission channels, different validation authorities, different reporting timelines, and different fiscal control arrangements must each be translated into ERP configuration, middleware design, and operational processes. Architectural decisions made for one jurisdiction do not transfer cleanly to another, and implementation investments can become path-dependent in ways that are difficult to reverse. How those different governance arrangements shape the conditions under which organisations must implement mandatory e-invoicing, not merely whether a mandate exists, is the question this thesis addresses and the one existing research has not yet answered.

This thesis investigates how regulations affect the implementation process of mandatory B2B e-invoicing in the EU, and more specifically how governance model variation shapes the conditions under which organisations must implement such requirements. The study approaches this from an information systems perspective, where regulation is understood not as an external constraint checked after the fact, but as something enacted through digital standards, validation sequences, and transmission architectures (Butler et al., 2023; Henningsson & Eaton, 2023).

1.1 Background

E-invoicing refers to structured and machine-readable invoice data that can be automatically processed by information systems, which allows invoice handling, validation, and reporting to become more standardised and efficient (Directive 2014/55/EU, 2014; European Commission, 2022; Baumeister & Volkmann, 2025). Research has shown that e-invoicing can reduce manual work, lower processing costs, improve transaction transparency, and support faster invoice handling for both businesses and public authorities (Bani Ahmad, 2024; Bellon et al., 2022; Tiwari et al., 2023).

Within the EU, the growth of e-invoicing has been shaped by both harmonisation and national variation. Directive 2014/55/EU created a common semantic basis for e-invoicing in public procurement by requiring public authorities to receive and process invoices that comply with the European standard EN 16931. However, this did not create one single European model for how e-invoices should be exchanged, validated, or reported. As a result, Member States have continued to develop different national approaches, with variation in transmission channels, validation mechanisms, reporting logics, and governance arrangements (Directive 2014/55/EU, 2014; European Commission, 2024; International Observatory on eInvoicing, 2025; Baumeister & Volkmann, 2025).

More recently, the EU's VAT in the Digital Age initiative has strengthened the role of structured e-invoicing and digital reporting in tax administration and cross-border coordination, while domestic implementation remains uneven across Member States (European Commission, 2022; Council Directive 2025/516, 2025; Baumeister & Volkmann, 2025; Merckx & Gruson, 2025). Regulation is no longer external to technology in this area. Instead, it is increasingly enacted through digital standards, platforms, reporting infrastructures, and system requirements, meaning that regulatory demands must be translated into practical implementation through enterprise systems, integration solutions, and data management processes.

For organisations, this regulatory evolution means that the invoice has ceased to be a largely internal document governed by bilateral business conventions. In jurisdictions with mandatory B2B e-invoicing, the invoice becomes the interface between the firm and the state: government platforms, certified service providers, and structured reporting channels mediate what was previously a direct exchange between trading parties. The format, transmission path, and validation logic of the invoice are no longer determined solely by the firm's internal systems or bilateral agreements with trading partners, but by governance arrangements established in national legislation. Enterprises operating across Member States must navigate a different set of such arrangements in each jurisdiction, adapting ERP configurations, integration architectures, and operational routines to governance models that differ in how invoices are transmitted, validated, and reported to tax authorities. Understanding what those different governance arrangements demand of enterprise systems is the core analytical challenge this thesis addresses.

1.2 Problem

While e-invoicing is often presented to improve efficiency, transparency, and tax control, its implementation is not straightforward. Organisations do not implement e-invoicing in the

same regulatory environment across the EU. Instead, they face different national rules, timelines, reporting requirements, and legal expectations, even within a broader EU framework (European Commission, 2022; Council Directive 2025/516, 2025; Baumeister & Volkmann, 2025).

The move toward mandatory B2B e-invoicing is not only a technical change, but also a regulatory one. Companies must understand new legal requirements and translate them into practical implementation within their own systems and processes, which may involve changes in invoicing routines, reporting practices, data handling, and system integration. Implementation becomes more complex when regulations differ between countries or continue to evolve over time.

Despite this, existing research has not addressed this problem from an information systems perspective. The dominant research trajectories treat e-invoicing either as an instrument of tax administration, studying compliance outcomes and VAT gap reduction, or as an organisational adoption question examined within single national contexts (Hesami et al., 2024; Heinemann & Stiller, 2025; Tiwari et al., 2023). Neither trajectory explains how governance model variation across jurisdictions produces structurally different ERP integration demands, middleware dependencies, and architectural flexibility requirements. This gap matters because, as Butler et al. (2023) argue, regulatory compliance in domains such as e-invoicing is increasingly enacted through information systems rather than applied to them, making governance model type, not merely the presence of a mandate, the key variable in understanding what implementation requires.

1.3 Purpose

The purpose of this thesis is to investigate how regulations affect the implementation process of mandatory B2B e-invoicing in the EU, with particular attention to how variation in governance model type shapes the conditions under which organisations must implement such requirements. The study approaches this from an information systems perspective. Rather than assessing legal compliance or evaluating tax policy outcomes, the aim is to understand how regulation becomes materially embedded in system design through format specifications, validation sequences, transmission architectures, and reporting requirements, and how different national governance arrangements produce qualitatively distinct demands on enterprise systems (Butler et al., 2023; Henningsson & Eaton, 2023).

To pursue this purpose, the study examines five EU Member States, Italy, France, Belgium, Germany, and Hungary, selected on representation of meaningful and structurally distinct variation in governance design, transmission architecture, reporting logic, and degree of centralisation. This selection makes it possible to compare how governance model type, rather than the shared EU regulatory direction, determines what that compliance challenge actually requires of enterprise systems.

The study contributes to IS research in two interconnected respects. Empirically, it produces the first systematic IS-oriented comparative governance profile of these five jurisdictions, structured around IS-relevant analytical dimensions derived from the corner model and CTC taxonomies established in Chapter 2. Conceptually, it demonstrates that governance model type is a more consequential explanatory variable than the simple presence of a mandate, a

distinction with direct implications for how cross-jurisdictional implementation burdens are understood, anticipated, and managed.

1.4 Research Question

How do regulations affect the implementation process of mandatory B2B e-invoicing in the EU?

In answering this question, the analysis resolves the broad notion of 'regulation' into a more specific explanatory variable: the type of governance model through which a mandate is operationalised. The study therefore moves from the general question of how regulation affects implementation toward the more precise claim that governance model type, rather than the existence of a mandate, determines the nature of the implementation challenge.

1.5 Delimitation

The empirical focus is limited to five selected Member States: Italy, France, Belgium, Germany, and Hungary. These countries were chosen because they represent meaningfully different regulatory and governance approaches to mandatory B2B e-invoicing, providing a suitable basis for comparative analysis. Non-EU countries fall outside the empirical scope and are referenced only where necessary for general context.

The study concerns B2B e-invoicing specifically. Business-to-government and business-to-consumer arrangements are excluded except where necessary for contextual understanding, since B2B e-invoicing raises distinct implementation issues related to changing regulatory requirements, reporting obligations, and cross-jurisdictional compliance that differ from other invoicing contexts.

The study is further delimited to the implementation process itself, rather than broader outcomes such as VAT gap reduction, macroeconomic effects, adoption rates, or end-user satisfaction. The analytical perspective is that of information systems rather than law, tax policy, or public administration, and attention is directed toward how regulation shapes implementation conditions in practice rather than what e-invoicing achieves at a macro level. The distinction the study draws is therefore not between the presence and absence of legal rules, but between regulation as legal doctrine and regulation as enacted through information systems. Following Butler et al. (2023), the thesis treats e-invoicing regulation as operationalised through formats, validation sequences, and transmission architectures, and it is this enacted dimension, rather than doctrinal legal interpretation, that the analysis addresses.

2 Theoretical Framework

This chapter develops the analytical apparatus guiding the study. Section 2.1 frames e-invoicing governance as a case of regulation enacted through information systems rather than applied to them. Section 2.2 examines the EU regulatory framework, establishing the paradox of a shared harmonisation agenda alongside persistent national governance divergence. Section 2.3 introduces the transmission architecture and governance model typology that serves as the coding vocabulary for the Results chapter. Section 2.4 surveys prior domain research and identifies the gap this thesis addresses. The sections are cumulative and together constitute an integrated analytical framework rather than a conventional literature review.

2.1 Regulation and Information Systems

Despite regulation's growing influence on how digital systems are designed and interconnected, it has remained a relatively under-examined object of study within IS research. Butler et al. (2023) note that while regulators and the public have raised sustained concerns about the risks posed by digital technologies, IS scholars have not responded with a commensurate theoretical apparatus. Seidel et al. (2025) reinforce this, arguing that constructing regulatory frameworks for digital technologies requires actors to make sense of systems whose consequences are unclear at the time of regulation, while the pace of technological development continues to challenge established regulatory processes. The result is a conceptual gap that becomes consequential wherever regulatory mandates are operationalised through information systems rather than merely applied to them.

Butler et al. (2023) distinguish between two modes of IT regulation. The first, regulation of IT, governs how information systems are built and used. The second, regulation through IT, enacts compliance through information systems rather than verifying it against them afterwards. Applied to the e-invoicing domain, this distinction frames mandatory e-invoicing governance as a case of regulation through IT. The relevant obligations concern document formats, data schemas, transmission channels, and validation sequences rather than conventional ex post reporting, making compliance a property of system structure rather than a separate verification step. This framing positions governance model divergence across Member States as a structural IS problem with direct enterprise implications and supports the argument that governance model type, rather than regulation per se, determines whether regulatory intervention expands or constrains enterprise architectural flexibility.

Henningsson and Eaton (2023) supply the mechanistic explanation for this thesis's central argument. Drawing on modular systems theory, they distinguish between two forms of governmental regulation of digital infrastructures. Regulation through performance targets sets visible design rules, covering interface specifications between components, component arrangements, and functional criteria, while leaving the internal design of each component open. Organisations can therefore adapt their systems independently provided they conform at the shared interface. Regulation through activity specification prescribes the process itself, mandating the methods or materials through which an activity must be carried out and constraining internal component design.

Since the interface-specifying function of performance target regulation is what matters most for the present analysis, this thesis refers to these two regulatory forms as interface-type regulation and activity specification respectively. The distinction explains why governance model type, rather than the existence of a mandate, determines the architectural adaptation demands organisations face. EN 16931 operates as interface-type regulation: it defines what a compliant invoice must contain while leaving transmission architecture, validation authority, and exchange path open. A centralised clearance mandate operates as activity specification: it requires that invoice exchange traverse a government platform, removing the design freedom that a semantic standard alone would preserve.

Wurzer and vom Brocke (2025) identify three structural challenges that regulation consistently imposes on IS: fragmented regulatory landscapes, the compliance costs of adapting systems to evolving mandates, and the pace of technological change that continually unsettles established arrangements. All three are present in the EU e-invoicing domain. National governance models diverge beneath a shared supranational framework, enterprise compliance investments are architecture-specific and substantial, and the regulatory landscape continues to evolve as ViDA extends mandatory e-invoicing obligations through 2030 while preserving space for domestic variation.

2.2 The EU E-Invoicing Regulatory Framework: Harmonisation and Its Limits

The EU e-invoicing framework is an instance of regulation through IS in the sense described by Butler et al. (2023). Council Directive (EU) 2025/516, the primary legislative instrument of the ViDA initiative, requires structured electronic invoicing and digital reporting for the relevant cross-border transactions within the ViDA regime. More specifically, it links compliance to machine-processable invoice data and to the reporting of relevant transaction data to tax authorities within defined deadlines. The OECD (2026) similarly observes that governance regimes differ in how and when fiscal validity is established, whether through pre-clearance, real-time validation, or post-audit, and that this timing is determined by system design rather than by legal declaration alone. The divergence examined in this thesis therefore operates at the level of system architecture rather than legal text. The three core components of this framework are discussed below.

In EU law, an electronic invoice is an invoice issued, transmitted, and received in a structured electronic format that enables automatic and electronic processing; formats such as PDF or image files do not meet this definition (Directive 2014/55/EU, Art. 2(1)). Directive 2014/55/EU established the foundational B2G mandate. Public authorities at all levels are required to receive and process electronic invoices compliant with the European standard EN 16931. The European Commission (2024) reports that this intervention was intended to reduce fragmentation caused by mandatory national and proprietary formats in public procurement. At the same time, transmission architecture, validation authority, supplier-side format obligations, and the B2B domain were left largely unaddressed. This was less an oversight than an expression of subsidiarity. It is also the structural origin of the governance divergence documented in this thesis.

EN 16931 is a semantic interoperability standard that specifies the data elements a compliant e-invoice must contain, with two mandatory syntax bindings, UBL 2.1 and UN/CEFACT

Cross Industry Invoice XML D16B, designated by European Committee for Standardization (2017). In Henningsson and Eaton's (2023) terms, introduced in section 2.1, EN 16931 functions as an interface specification, it defines interaction rules while leaving internal system design open. A mandate for centralised government clearance, by contrast, operates as an activity specification. This distinction explains mechanistically why governance model type, rather than the shared semantic standard, determines the architectural adaptation demands enterprises face. In practice, the standard has not produced uniform implementation.

Markus et al. (2006) show that IS standardisation involves two linked collective action dilemmas, development and diffusion, whose structural characteristics differ enough that solving the first does not necessarily solve the second. They further explain that diffusion may fail when dominant participants already benefit from proprietary interconnection arrangements and therefore have limited incentive to converge on a universal standard. This dynamic is reinforced by what Modol and Eaton (2021) describe as generative entrenchment: early infrastructure commitments shape subsequent development trajectories in ways that make later-stage convergence increasingly difficult, even where shared standards formally exist.

Member States that built national platforms during early adoption phases are structurally positioned to resist architectural harmonisation that would require those investments to be reconsidered. The European Commission (2024) documents that national Core Invoice Usage Specifications have become a source of fragmentation rather than harmonisation, with enterprises required to maintain separate technical implementations across Member States even where EN 16931 is formally adopted. The International Observatory on eInvoicing (2025) reaches a similar conclusion at the cross-national level, describing B2B adoption in the EU as uneven and marked by major differences in both structured data formats and the use of centralised or decentralised systems. Governance divergence therefore persists at a layer the semantic standard does not fully govern, namely the architecture of validation, transmission, and fiscal control.

ViDA, comprising Council Directive (EU) 2025/516, Council Regulation (EU) 2025/517, and Council Implementing Regulation (EU) 2025/518, is the primary current policy anchor. Three features are particularly important for the argument of this thesis. First, it makes EN 16931-based electronic invoicing mandatory for intra-EU cross-border B2B transactions by 2030 and introduces digital reporting requirements for transaction data. Second, it removes the previous requirement that the recipient accept EN 16931-compliant electronic invoices within the relevant regime, thereby making structured electronic invoicing the default for those transactions. Third, and most consequential for this thesis, it preserves scope for Member States to maintain or introduce domestic B2B e-invoicing mandates alongside the cross-border framework. The European Commission's (2025) call for evidence on revising the eInvoicing Directive acknowledges that further harmonisation remains necessary because the current landscape still creates interoperability problems and administrative burdens for businesses operating across borders. ViDA thus advances harmonisation at the semantic and reporting level while structurally preserving the conditions for domestic governance divergence.

2.3 E-Invoicing Transmission Architectures and Governance Model Types

In this thesis, governance model type refers to the configuration of three structural dimensions through which a mandate is operationalised: the placement of validation authority, the timing of fiscal reporting relative to commercial exchange, and the architecture through which invoices are transmitted. It is this configuration, rather than the mere presence or absence of a mandate, that constitutes the central explanatory variable of the study. The remainder of this section develops the typological vocabulary through which these dimensions are specified. The corner model and Continuous Transaction Controls (CTC) typologies originated in B2G and public-procurement contexts, where structured invoice exchange was first mandated. They are applied here as analytical tools for the B2B governance arrangements under study, on the basis that the structural dimensions they capture, validation placement, reporting timing, and transmission architecture, are transferable across the B2G/B2B boundary even though the present study's empirical scope is delimited to B2B.

E-invoicing transmission architectures are classified by the number and functional role of parties involved in the exchange and fiscal reporting chain. Each model instantiates what Hanseth and Modol (2021) term an architecture-governance configuration: the placement of validation authority, the sequencing of reporting relative to exchange, and the network participation rules enterprises must satisfy each reflect a distinct structural arrangement. The established taxonomy, progressively endorsed by international bodies, provides the typological vocabulary applied in the Results chapter. Each model is characterised as relevant along three dimensions: where validation authority sits, when fiscal reporting occurs relative to commercial exchange, and what integration surface is exposed to enterprise systems.



Figure 1: two-corner model

Source: International Observatory on eInvoicing (2025)

The two-corner model is the minimal configuration, enabling direct transmission between supplier and buyer without intermediation beyond a network connection (see Figure 1). It requires individual bilateral connections per trading relationship and does not scale as the number of trading partners grows (International Observatory on eInvoicing, 2025).

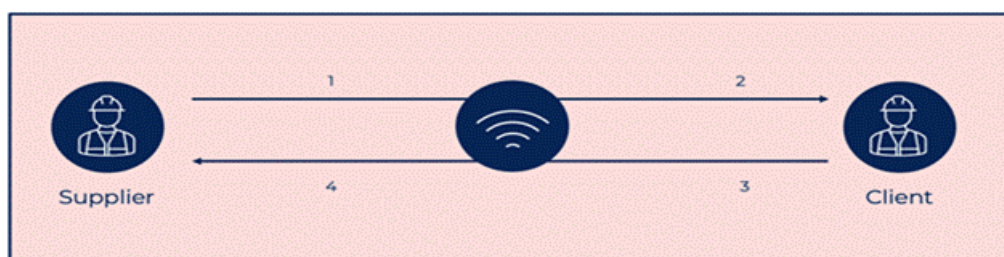


Figure 2: three-corner model

Source: International Observatory on eInvoicing (2025)

The three-corner model introduces a shared service provider intermediary through whose platform both parties transact (see Figure 2). The model improves consistency and supports structured formats, but scalability remains constrained: as trading relationships multiply, enterprises face connections to multiple provider platforms with varying format standards and transmission protocols (International Observatory on eInvoicing, 2025). The four-corner model resolves this by enabling interoperability between separate service provider networks through agreed document formats and communication protocols (see Figure 3). Each participant connects once to a certified access point, and documents are routed across networks through a common interoperability framework, with Peppol, an open, standardised four-corner network for exchanging structured electronic documents between certified access points, constituting the reference implementation of this principle (International Observatory on eInvoicing, 2025; OpenPeppol, 2021).

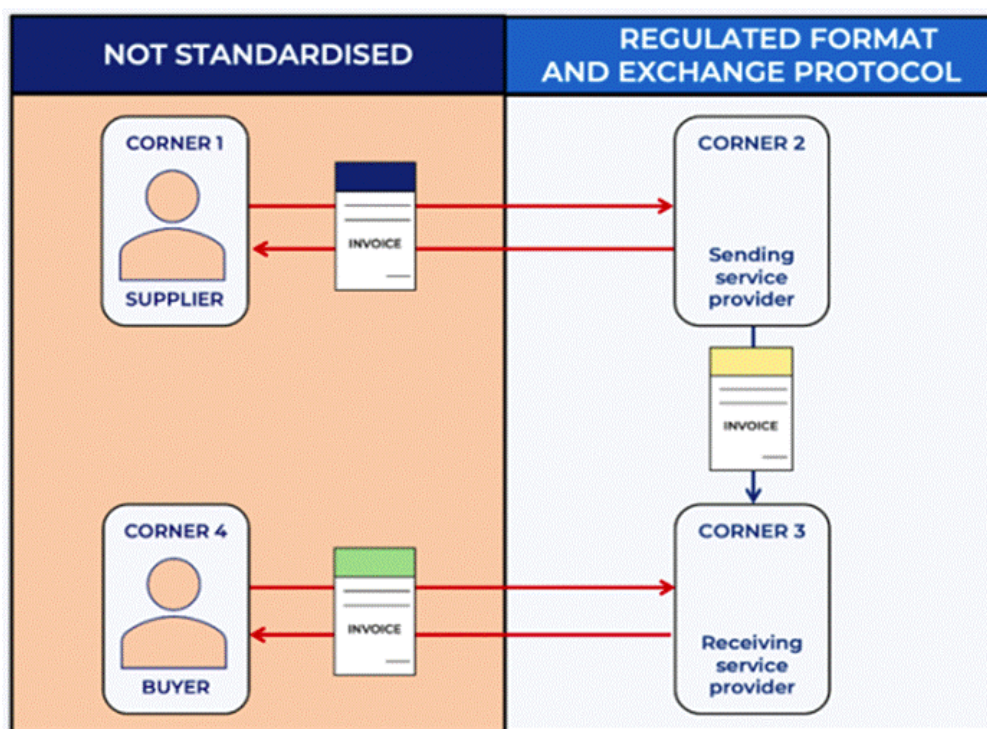


Figure 3: four-corner model

Source: OpenPeppol (2021)

The five-corner model extends this structure by adding a government-controlled reporting node, Corner 5, which receives transactional data from Corner 2, Corner 3, or both, for fiscal control purposes without routing the commercial invoice through the government platform (see Figure 4; OECD, 2026; Kollmann et al., 2022). The structural separation between

commercial exchange flow and fiscal reporting flow is the architecturally distinctive property of this model.

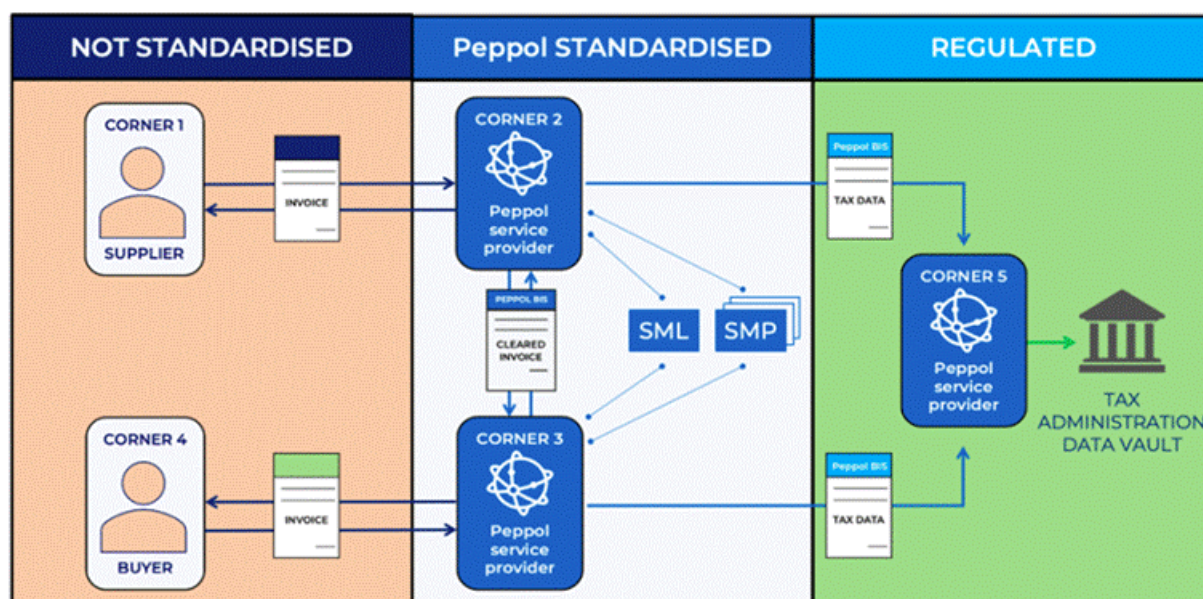


Figure 4: five-corner model
Source: Kollmann et al. (2022)

CTC governance logics are layered on top of the exchange architecture and determine how fiscal control is exercised within or alongside the exchange process. Figure 5 presents a comparative overview of all model types. Under Real-Time (Invoice) Reporting (RTIR), transactional data is submitted to the tax authority independently of and in parallel to the commercial exchange, leaving the exchange path itself unconstrained (OpenPeppol, 2021; Kollmann et al., 2022).

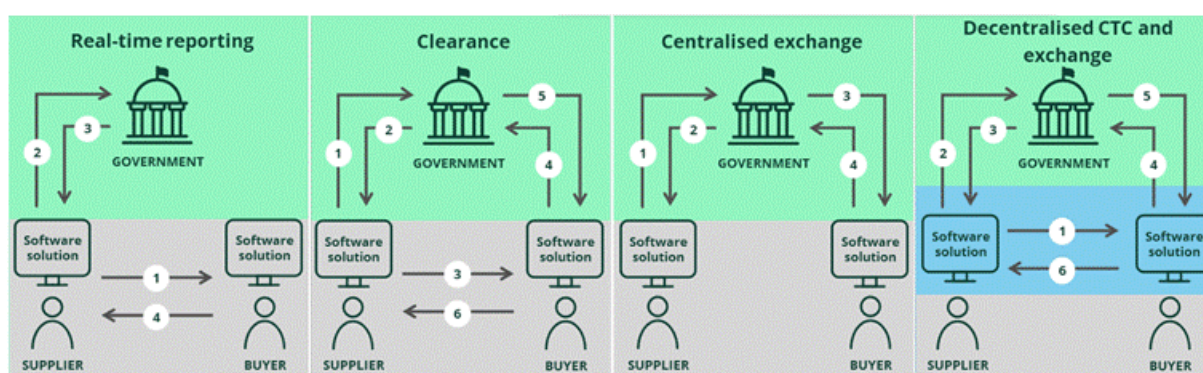


Figure 5: CTC models
Source: Kollmann et al. (2022)

Under the clearance model, fiscal validity conditions exchange: the government platform validates the invoice before delivery to the buyer in pre-clearance configurations, or within a defined window after delivery in post-clearance ones, with further variation depending on whether clearance authority is exercised by the central platform or delegated to accredited service providers (OpenPeppol, 2021; Kollmann et al., 2022; International Observatory on eInvoicing, 2025). The centralised exchange model goes further still, making the government platform the exclusive routing infrastructure through which all invoices pass end-to-end, thereby replacing direct enterprise-to-enterprise exchange entirely (OpenPeppol, 2021;

International Observatory on eInvoicing, 2025). The Decentralised CTC and Exchange model distributes both exchange and simultaneous fiscal reporting across a network of certified service providers, with Corner 5 receiving a validated data subset rather than handling the exchange itself (OpenPeppol, 2021; Kollmann et al., 2022). The OECD (2026) identifies this five-corner instantiation as the preferred direction for jurisdictions designing interoperable Digital Continuous Transactional Reporting regimes, noting its growing adoption in Europe and Asia.

2.4 Prior Domain Research and Identified Gap

Research on e-invoicing has grown substantially over the past decade but has developed along two trajectories that together leave the central question of this thesis unaddressed.

The first treats e-invoicing as an organisational and technological phenomenon. Tiwari et al. (2023) position e-invoicing as organisational infrastructure and a catalyst for wider enterprise digitalisation, documenting adoption barriers and incentives across Slovenian organisations. Qi and Che Azmi (2021) examine adoption factors using the technology–organization–environment framework, demonstrating that perceived benefit and trust in e-government drive adoption and that adoption in turn improves tax compliance process efficiency, though within a single national mandate and without reference to the governance architecture underlying it. These studies share a concern with the consequences of a given mandate rather than with how variation in governance model type produces structurally different integration demands across mandates.

The second treats e-invoicing primarily as an instrument of tax administration. Heinemann and Stiller (2025) provide rigorous quasi-experimental evidence from Italy's clearance-based mandate, showing a significant reduction in cross-border VAT fraud and increased enterprise integration investment in response. Mueller-Toeroek and Schmidt (2024) document concrete implementation obstacles in Germany, including format ambiguity, EDI interoperability gaps, and organisational readiness failures, findings that confirm the practical weight of regulatory complexity but remain confined to a single national context. Both are single-country analyses concerned with adoption and compliance outcomes rather than comparative governance architecture. A systematic review by Hesami et al. (2024) independently confirms this orientation: the dominant research concern across the field is the impact of e-invoicing on compliance outcomes and tax administration efficiency, not on how governance model type shapes enterprise architectural configuration.

A nascent IS-situated strand addresses e-invoicing as an enterprise integration problem. Hoblos et al. (2024) frame adoption as an API connectivity challenge and propose a modular service ecosystem for SME compliance. Baumeister and Volkmann (2025) use a morphological box to derive ERP integration requirements from EU ViDA obligations and design a web application platform, demonstrated on SAP Business ByDesign, themselves noting the absence of prior IS research addressing EU VAT requirements in this way. Bani Ahmad (2024) documents cost-efficiency gains from invoice process automation in multinational corporations, while Naghshineh et al. (2025) frame adoption as a process reengineering challenge in similar contexts, identifying process transparency, redundant activities, and task automation as the primary obstacles. These contributions confirm that IS research is beginning to engage with e-invoicing as a systems integration phenomenon, but

each treats integration requirements as technically given within a single mandate context rather than as a structural consequence of governance model variation.

Domain research on e-invoicing governance appears primarily in tax economics, e-government, and practitioner-adjacent outlets, and the nascent IS-situated strand is represented largely in conference proceedings and working papers rather than established IS venues. This distribution is itself a signal of how recently the field has begun to engage with e-invoicing as a systems integration problem. No study explains how governance model type, as distinct from the presence or absence of a mandate, produces ERP integration patterns, middleware dependencies, and architectural flexibility requirements that differ in kind across jurisdictions. IS research has established that the implementation of information systems is a strategic practice shaped by contextual conditions, regulatory, organisational, and architectural, rather than a neutral technical deployment (Arvidsson et al., 2014). Applying this perspective to the EU e-invoicing domain requires understanding how governance model variation, not merely the existence of a mandate, shapes what that strategic practice involves.

2.5 Theoretical Framework Summary

Table 1 maps each theoretical body, regulatory instrument, and domain source deployed in this chapter to its specific analytical function in the thesis. The structure is cumulative: section 2.2 establishes the paradox of shared harmonisation and persistent governance divergence, and the mechanism by which governance model type shapes IS flexibility, section 2.3 provides the typological vocabulary for the Results coding frame, and section 2.4 establishes the research gap. Together they constitute an integrated analytical apparatus rather than a sequential literature review.

Table 1: Theoretical Framework Summary

Theme	Key Sources	Role
Regulation & IS	Butler et al. (2023); Seidel et al. (2025); Henningsson & Eaton (2023); Wurzer & vom Brocke (2025)	Frames e-invoicing governance as regulation through IS; positions governance model divergence as a structural IS phenomenon; Henningsson & Eaton's performance target and activity specification distinction explains mechanistically how governance type shapes IS flexibility
Regulatory Framework	Directive 2014/55/EU; Council Directive 2025/516; Regulation 2025/517; Implementing Regulation 2025/518; European	Establishes the empirical paradox: a shared harmonisation agenda and semantic standard alongside persistent national governance divergence

Theme	Key Sources	Role
	Commission (2024); European Commission (2025)	
Standards as Collective Action	Markus et al. (2006); International Observatory on eInvoicing (2025)	Explains why EN 16931 resolved the development dilemma but not the diffusion dilemma; grounds the fragmentation finding empirically across Member States
Transmission Architectures	OpenPeppol (2021); Kollmann et al. (2022); OECD (2026); International Observatory on eInvoicing (2025)	Supplies the corner model and CTC taxonomy applied as the typological basis of the Results coding frame
Domain Evidence & Gap	Heinemann & Stiller (2025); Mueller-Toeroek & Schmidt (2024); Tiwari et al. (2023); Qi & Che Azmi (2021); Hesami et al. (2024); Hoblos et al. (2024); Baumeister & Volkman (2025); Bani Ahmad (2024); Naghshineh et al. (2025)	Grounds the study empirically across three research trajectories; confirms that IS-situated research addresses adoption and ERP integration in single-mandate contexts but does not explain how governance model variation produces structurally different integration demands across jurisdictions

3 Methodology

This chapter presents the research design of the study and motivates the methodological choices made. It opens with the research philosophy and overall design, before specifying the unit of analysis and the logic of case selection. The construction of the document corpus and the criteria governing source inclusion are then described, followed by the interview design and respondent selection. The chapter closes with the data analysis procedure, researcher reflexivity, scientific quality, and ethical considerations. The design is qualitative, comparative, and abductive throughout, and is suited to a study aimed at analytical rather than statistical generalisation.

3.1 Research Philosophy and Research Design

This thesis adopts an interpretivist research philosophy grounded in a social constructivist epistemology. E-invoicing governance is understood as a socio-technical arrangement constituted through legislation, standards, administrative guidance, infrastructure rules, and implementation practice. The purpose is therefore not to test causal hypotheses or produce statistical generalisations, but to interpret how governance arrangements differ across contexts and what those differences imply for enterprise information systems. This position is consistent with interpretive IS research, which is suited to phenomena characterised by contextual complexity, institutional embeddedness, and the need for analytical understanding rather than causal measurement (Goldkuhl, 2012; Klein & Myers, 1999; Walsham, 2006). The study adopts an interpretive rather than a critical stance (Myers & Klein, 2011): the aim is to understand how governance arrangements are experienced and enacted in practice, rather than to critique the power relations that constitute them.

Methodologically, the study is qualitative, theory-informed, comparative, and abductive. It is qualitative because the research problem concerns interpretation, classification, and architectural consequence rather than quantification. It is theory-informed because the analysis begins from an analytically motivated framework derived from prior literature, while remaining open to refinement through engagement with the empirical material. It is comparative because governance divergence only becomes visible across jurisdictions rather than within a single national context. It is abductive because the analysis moves iteratively between theory and empirical material: an initial theory-informed coding frame is developed from the literature and then refined through engagement with the documentary corpus and expert interviews (Goldkuhl, 2019). The aim is therefore analytical rather than statistical generalisation (Walsham, 1995; Lee & Baskerville, 2003).

The research strategy is a comparative multiple-case document study complemented by a small number of semi-structured expert interviews. The documentary material constitutes the primary empirical basis for the governance classifications, while the interviews function as a complementary interpretive layer that carries independent analytical weight in developing the study's themes and conceptual contributions. This design is suitable because e-invoicing governance is materially expressed through documents such as legislation, administrative guidance, infrastructure rules, and technical specifications, while the architectural

implications of those arrangements benefit from informed practitioner interpretation (Bowen, 2009; Goldkuhl, 2019; Myers & Newman, 2007).

3.2 Unit of Analysis and Case Selection

The unit of analysis in this thesis is the national B2B e-invoicing and digital reporting governance arrangement within selected EU jurisdictions. Each country is treated as a case. The cross-case comparison focuses on how governance arrangements differ in terms of transmission architecture, validation authority, reporting logic, interoperability design, and centralisation, and on how these differences shape the implementation conditions faced by organisations. Case selection follows a logic of theoretical variation rather than statistical representativeness. In interpretive and qualitative research, cases are selected because they are analytically useful and capable of revealing meaningful variation, not because they statistically represent a larger population (Walsham, 1995; Lee & Baskerville, 2003). Only EU countries with existing, legally adopted, or clearly specified B2B e-invoicing and/or digital reporting arrangements were considered. From this broader pool, the final cases were chosen to maximise meaningful variation across governance design, reporting logic, transmission architecture, and interoperability arrangements. Concretely, each selected case instantiates a structurally distinct governance model: Italy a centralised exchange model, France a decentralised CTC hybrid on a five-corner architecture, Belgium a decentralised four-corner network-interoperability model, Germany a format mandate without an operative reporting architecture, and Hungary a real-time invoice reporting model. Other EU jurisdictions with active mandates, such as Poland, Spain, the Netherlands, or Romania, were not excluded on relevance grounds but because they would have largely duplicated one of these five structural types rather than adding a further distinct configuration.

As shown in Table 2, the selected countries represent different governance-model configurations and therefore provide a suitable basis for analytical comparison within a shared EU regulatory environment.

Table 2: Selected Cases and Comparative Rationale

Country	Comparative Relevance	Expected governance contribution
Italy	Mature mandatory B2B model with long implementation history	Centralised clearance and strong fiscal control logic
France	Major ongoing B2B rollout under a hybrid architecture	Five-corner / public-private intermediary model
Belgium	Peppol-based policy direction with reporting focus	Decentralised interoperability-oriented model

Country	Comparative Relevance	Expected governance contribution
Germany	Large-market case with format mandate and undefined future reporting architecture	Format mandate without operative CTC model; planned Meldesystem unspecified
Hungary	Mature real-time reporting environment with strong tax authority role	Reporting-heavy control model and high integration burden

This selection does not seek to cover all Member States. Instead, it is designed to capture a meaningful range of governance-model variation in a manageable and analytically defensible case set, consistent with qualitative comparative research aimed at analytical rather than statistical generalisation (Walsham, 1995; Lee & Baskerville, 2003).

3.3 Data Collection and Document Corpus

The main data collection method is document analysis. In this thesis, documents are not treated merely as background material but as part of the phenomenon under study. Governance arrangements in e-invoicing are materially constituted through directives, regulations, standards, administrative guidance, infrastructure governance rules, and implementation specifications. Document analysis is therefore the most suitable primary method and is understood as a systematic process of reviewing, selecting, evaluating, and interpreting documentary material (Bowen, 2009; Goldkuhl, 2019).

The document corpus consists of four main categories: EU and supranational sources, national primary sources, infrastructure governance sources, and selected secondary sources used for contextualisation and cross-checking. Among these, EU and national primary sources form the core empirical basis of the document analysis, while infrastructure governance sources and selected secondary sources are used primarily to clarify operational details, support interpretation, and cross-check findings. EU and supranational sources provide the harmonisation context, national legal and administrative sources provide the case-specific governance arrangements, and infrastructure governance sources help clarify how interoperability and transmission are operationalised in practice.

Documents are included when they provide evidence on one or more of the following dimensions: mandate scope, transmission architecture, validation authority, reporting timing, format obligation, interoperability mechanism, or participation and access requirements. Documents that are purely promotional, vendor-driven, or technically detailed without contributing to the understanding of governance logic are excluded. This inclusion logic is consistent with the principle that document analysis should be purposeful and closely tied to the research question rather than merely extensive (Bowen, 2009; Goldkuhl, 2019).

The collection process is systematic rather than ad hoc. Documents are gathered primarily from official and authoritative sources such as EUR-Lex, European Commission websites, national ministries, tax authority portals, government or parliamentary sites, and infrastructure governance bodies such as OpenPeppol. To maintain transparency and traceability, a document log is kept throughout the collection process. The log records source, date accessed, jurisdiction, document type, legal or administrative status, and relevance to the analytical dimensions. This supports transparency and strengthens the dependability of the study (Bowen, 2009; Goldkuhl, 2019).

Where official English versions are unavailable, documents are analysed in the original language where possible and otherwise through AI-assisted working translation. Because translation is itself an interpretive act and meaning may shift across languages, translated passages are treated as analytical aids rather than substitutes for the source text. The AI tools used for this purpose are documented in Appendix 1. In cases of ambiguity, classification decisions are anchored in the original official wording, which takes precedence over any translated paraphrase. This is particularly important in a comparative regulatory study, where relatively small linguistic differences may affect how governance arrangements are interpreted and compared (Baumgartner, 2012).

3.4 Source Evaluation

Because documentary sources differ in purpose, completeness, and legal authority, they are assessed critically rather than treated as neutral representations of governance arrangements. In this study, documents are evaluated in terms of their origin, authority, purpose, and analytical relevance to the research question. This is particularly important because the corpus includes both hard-law material and softer administrative or infrastructure governance documents, which do not carry the same status but may still be highly important for understanding how governance works in practice (Bowen, 2009; Goldkuhl, 2019).

Official legal texts can define formal obligations, while administrative guidance and infrastructure rules often reveal how control, interoperability, and participation are operationalised. The analysis therefore does not assume that all document types contribute in the same way. Instead, documents are interpreted in relation to the role they play in constituting, explaining, or operationalising the governance arrangement under examination. Where differences arise between legal texts, administrative guidance, and infrastructure governance documents, priority is given to formal legal obligations, while softer sources are used to clarify how those obligations are interpreted and operationalised in practice.

3.5 Interview Design and Respondent Selection

To complement the document analysis, the thesis includes five semi-structured expert interviews. They function as a complementary interpretive layer that carries independent analytical weight in theme development, rather than as a subordinate check on the documentary material. While the document corpus establishes the governance architecture of each case, the interviews are the primary basis for the interpretive themes developed in the second analytical cycle, and several of the study's conceptual contributions emerge primarily

from this material. Their role is therefore interpretive and theory-developing alongside the documents, not merely confirmatory. More specifically, the interviews are used to assess whether the analytical dimensions developed from the document analysis are meaningful in implementation practice, whether important architectural implications remain under-specified in the documentary material, and whether the comparative interpretation is plausible from the perspective of practitioners directly involved in implementation (Myers & Newman, 2007; Goldkuhl, 2019).

The use of semi-structured interviews is appropriate because it combines comparability across interviews with enough openness to probe for clarifications, examples, and practical nuances not visible in formal documents. This is particularly relevant in IS research when the aim is not simply to describe formal structures, but to understand how they are interpreted and translated into organisational and technical practice (Myers & Newman, 2007; Walsham, 2006). Interviews are therefore used here as a supplementary empirical layer that helps refine the interpretation of the documentary analysis rather than replace it.

Participants are selected purposely based on direct experience with e-invoicing implementation, digital reporting obligations, ERP or middleware integration, or compliance architecture across EU jurisdictions. Participants hold roles spanning implementation management, solution architecture, VAT advisory, and finance product consultancy, reflecting the cross-functional nature of e-invoicing implementation work. Respondents qualify as experts based on direct, senior-level responsibility for e-invoicing implementation across multiple EU jurisdictions, rather than general familiarity with the topic. Each has led or advised on concrete cross-jurisdictional implementation projects, giving them practitioner insight into how governance arrangements are translated into system and process design. The interview guide is organised around a small number of themes rather than a rigid script (see Appendix 2). These themes include perceived differences between national governance models, architectural and integration consequences, flexibility and lock-in, and the practical usefulness of the analytical dimensions developed from the document study. In line with qualitative interviewing practice, the interview guide functions as a structured support rather than a fixed questionnaire, leaving room for probing, clarification, and interpretive follow-up (Myers & Newman, 2007). The interview component was designed to provide implementation-oriented perspectives from professionals working directly with e-invoicing, digital reporting, tax compliance, and related system adaptation.

Table 3 provides an overview of the respondents, their professional positions, and their primary country exposure relevant to the study.

Table 3: Respondent Details

Respondent	Country	Position
R1	Italy, France and Belgium	Senior Implementation Manager
R2	Germany, Hungary and France	Lead Solution Architect in Tax Compliance
R3	Germany, France, Belgium and Poland	Manager VAT & Member of Core E-Invoicing Team
R4	Netherlands, Belgium, Germany, France, Hungary, and other EU markets	VAT Specialist
R5	Italy, Hungary, Belgium	Finance Product Consultant

Table 4 provides an overview of the interview dates, contact points, durations, and transcription methods for each respondent.

Table 4: Interview Details

Respondent	Interview Date	Contact Point	Duration	Appendix	Transcription /Translation
R1	4/5-2026	Microsoft Teams	45 minutes	3	Microsoft Teams
R2	7/5-2026	Microsoft Teams	47 minutes	4	Microsoft Teams
R3	8/5-2026	Microsoft Teams	50 minutes	5	Microsoft Teams/DeepL
R4	12/5-2026	Microsoft Teams	43 minutes	6	Microsoft Teams
R5	12/5-2026	Microsoft Teams	55 minutes	7	Microsoft Teams

3.6 Data Analysis Procedure

The analysis follows an abductive and staged procedure. The purpose of the analysis is not only to describe differences in national e-invoicing regulation, but also to interpret how these differences affect the implementation process of mandatory B2B e-invoicing in the EU. Since the study focuses on regulation, implementation, and variation across Member States, the analysis moves iteratively between the empirical material and the theoretical framework throughout the research process (Goldkuhl, 2019; Walsham, 2006). The first stage consists of case profiling. For each selected country, a structured case profile is developed based on the documentary material. These profiles summarise the main features of each national regulatory setting, such as mandate scope, reporting logic, transmission model, validation arrangements, and implementation status. This stage creates an organised basis for comparison while preserving the context of each case (Goldkuhl, 2019).

The second stage consists of first cycle descriptive coding of the documents. At this stage, the aim is to classify regulatory and governance arrangements rather than to interpret their consequences in depth. The coding frame is theory informed and guided by the research question, with attention given to dimensions such as exchange model, reporting model, validation locus, interoperability mechanism, format requirements, degree of centralisation, and implementation stage. This makes it possible to identify how national approaches differ within the broader EU regulatory environment (Goldkuhl, 2019).

The third stage is cross case comparison. After the case profiles have been coded, they are compared systematically to identify recurring similarities and meaningful differences across jurisdictions. The purpose is not only to show that variation exists, but also to understand how different regulatory arrangements create different implementation conditions for firms. This stage is central to answering the research question, since the implementation process is shaped by how regulations are structured and enacted in different national contexts (Walsham, 1995; Lee & Baskerville, 2003).

The fourth stage is second cycle interpretive coding. Here, the analysis moves from description to interpretation. The comparative material is read through the theoretical lenses presented in the thesis to examine how regulatory variation may influence implementation in practice. This includes, for example, differences in compliance demands, system adaptation, integration needs, reporting routines, and flexibility in implementation. Throughout this stage, descriptive classification is kept analytically separate from interpretive claims to strengthen transparency and confirmability (Goldkuhl, 2019; Klein & Myers, 1999).

The fifth stage consists of interview-based interpretive analysis. The five interviews are analysed as a complementary layer that carries independent analytical weight rather than serving only to confirm the documentary findings. Their role is not to provide broad empirical coverage or statistical saturation, but to develop the interpretive themes and to show how implementation professionals understand and experience regulatory demands in practice. Several of the study's conceptual contributions are grounded primarily in this interview material. Since the study has an interpretive approach, the interview material is analysed with particular attention to how respondents describe implementation challenges, regulatory differences, and organisational responses in their own words (Myers & Newman, 2007; Walsham, 2006).

In the analysis of the interview material, In Vivo Coding is used as an initial coding technique. According to Saldaña (2011), In Vivo Coding is based on the actual language used by participants, where words or short phrases are selected because they are especially meaningful or capture the essence of what is being expressed. This coding method is suitable for the present study because it helps preserve the respondents' own language in the early stage of analysis and supports an interpretive reading of how implementation is understood by practitioners themselves (Saldaña, 2011). In Vivo Coding is applied only at the first-cycle stage to preserve respondents' own language; the second-cycle grouping into higher-level themes is explicitly theory-informed rather than inductive, making the overall procedure a theory-informed hybrid rather than a purely grounded-theory approach.

After the initial In Vivo Coding, similar codes are grouped into broader categories and then related to the emerging analytical framework. In this way, the interview analysis moves from respondent language to more abstract interpretation while remaining grounded in the empirical material. This helps the study capture both practical implementation concerns and the meanings respondents attach to them (Saldaña, 2011; Goldkuhl, 2019).

The analytical logic is abductive throughout: theory sensitises the analysis while the empirical material refines the interpretation (Goldkuhl, 2019; Walsham, 2006).

To increase transparency in how the interview material is organised analytically, the coding structure, including the elements column linking each subcode to specific respondent quotations, is presented as Table 6 in section 4.3 alongside the interpretive findings it organises. In contrast to a purely descriptive coding frame, the structure is designed to align the interview analysis with the theoretical framework. More specifically, the themes reflect the study's analytical interest in regulation through information systems, the tension between harmonisation and national divergence, the limits of shared standards, differences in transmission architecture, and the enterprise integration consequences that emerge in practice. The coding structure functions as an analytical bridge between respondent language, the theoretical framework, and the later presentation of the findings in the results part.

3.7 Researcher reflexivity

Because this is an interpretive study, the researcher is not a neutral extractor of facts but an active interpreter of documents and interview material. Interpretive IS research therefore requires reflexive awareness of how analytical choices shape what becomes visible in the study (Klein & Myers, 1999; Walsham, 2006).

In this thesis, e-invoicing governance is approached primarily through an information systems and enterprise-architecture lens rather than a doctrinal legal lens. This enables the study to foreground system implications, interoperability structures, and architectural adaptation, but it also creates the risk of underemphasising legal nuance or over-reading implementation consequences from formal texts alone. In addition, the professional background of the interviewees means that the empirical material may place stronger emphasis on operational feasibility and implementation practice than on legal doctrine in a narrower sense. To reduce this risk, the study separates descriptive coding from interpretive coding, documents major analytical decisions in an audit trail, and uses expert interviews to refine or challenge emerging interpretations rather than simply confirm them.

3.8 Scientific Quality

Scientific quality is assessed through credibility, dependability, confirmability, and transferability, understood in a way that fits qualitative and interpretive research (Klein & Myers, 1999; Walsham, 1995; Lee & Baskerville, 2003).

Credibility is strengthened through triangulation across EU legal texts, national legislation, administrative guidance, infrastructure governance rules, and expert interviews. It is also supported by the explicit separation between descriptive governance classification and interpretive architectural inference. The use of respondents with different professional roles and country exposure also supports credibility by bringing multiple implementation-oriented perspectives into the analysis. Negative cases, instances where the interview material did not confirm or fit the emerging analytical patterns were actively sought and examined. R4's observation that cross-country data requirements are not conflicting but additive (delta-on-base-layer logic), for instance, provides a qualification to the governance divergence argument and is treated as an analytical nuance rather than suppressed.

Dependability is supported by an audit trail that documents case profiles, coding dimensions, category definitions, source logs, and revisions made during the abductive analysis process. This allows the progression from source material to analytical interpretation to be followed in a transparent way (Goldkuhl, 2019).

Confirmability is strengthened by maintaining reflexive awareness of the researcher's interpretive role and by ensuring that claims are anchored in identifiable documentary or interview-based evidence. The use of a structured analytical procedure and the distinction between first-cycle and second-cycle coding also support confirmability.

Transferability is pursued through analytical rather than statistical generalisation. The study does not claim that its findings apply universally to all regulatory settings. Rather, it seeks to generate insights that may be analytically relevant to other forms of digitally embedded regulatory infrastructure, particularly where rules are operationalised through standards, platforms, and data exchange requirements (Walsham, 1995; Lee & Baskerville, 2003).

3.9 Ethical considerations

The documentary corpus mainly consists of publicly available material and therefore raises limited ethical concerns. The main ethical considerations relate to the interview component.

Participation is voluntary, and interviewees are informed about the purpose of the study, the use of the material, and their right to withdraw before final use of the data. Informed consent is obtained before recording, and the interview format is explained in advance. Because the interviewees may possess commercially sensitive implementation knowledge, no client-identifiable or proprietary technical detail is reported. Anonymisation is applied unless explicit permission for identification is granted. Audio files and transcripts are stored securely and used only for research purposes. Where interview material involved translation, care was taken to preserve meaning as closely as possible, and translated passages were treated as interpretive representations of the original spoken material rather than exact linguistic equivalents. These precautions are intended to protect participants while still allowing their

expertise to contribute meaningfully to the study (Myers & Newman, 2007; Walsham, 2006). Following each interview, a curated transcript was shared with the respondent via email. This was done to allow them to review the content, confirm the accuracy of their statements, and provide any corrections before the transcript was used in analysis. Identifying details were removed from the version shared with respondents outside the research team. This approach supports both the ethical commitment to transparency and the credibility of the interpretive analysis.

4 Results

This chapter presents the empirical findings in two complementary parts. The first part describes how respondents characterised the transition from traditional invoicing to mandatory e-invoicing, providing a cross-cutting account of how regulatory demands become implementation challenges in practice. The second part presents the document-based case profiles for the five selected jurisdictions, structured around a common set of analytical dimensions, followed by five interpretive themes developed through the expert interview analysis. The document profiles and interview themes are read in relation to each other throughout the chapter: the profiles establish the governance architecture of each case, while the themes give interpretive substance to the implementation consequences that architecture produces.

4.1 Transition from traditional invoicing to e-invoicing

This section draws on the expert interview material to provide a cross-cutting account of how implementation professionals characterise the transition from traditional invoicing to mandatory B2B e-invoicing. It functions as a contextualising layer for the document-based case profiles that follow. Section 4.2 constitutes the primary empirical material of the study; the accounts presented here establish the practical register in which regulatory demands become implementation challenges.

Across all five interviews, the transition is not described as a simple format change. It is described as a broader implementation process in which regulatory requirements, organisational routines, system design, and operational responsibilities become progressively interconnected. This applies to both outgoing invoicing, where firms must generate and transmit invoices in compliant structured formats, and incoming invoicing, where organisations must receive, process, validate, and manage invoices under new regulatory and technical conditions. The governance model of each jurisdiction shapes which aspects of this process receive the greatest pressure.

Table 5: Description of transition by respondents

Transition Type: Describing the transition from non e-invoicing to e-invoicing			
Interviewee	Role	Transition to E-Invoicing Process	Appendix
R1	Senior Implementation Manager	Regulatory and organisational transformation	3
R2	Lead Solution Architect in Tax Compliance	Layered compliance transformation	4
R3	Manager VAT & Member of Core E-Invoicing Team	Current-state to target-state fit-gap transition	5

Transition Type: Describing the transition from non e-invoicing to e-invoicing			
R4	VAT Specialist	Data-driven scoping and system gap-bridging transition	6
R5	Finance Product Consultant	Regulated transformation of invoicing logic	7

Respondents characterised this transition differently depending on their professional roles and country experience, as summarised in Table 5. R1 described it as a regulatory and organisational transformation in which legal requirements become operational constraints through system design. R2 emphasised the layered compliance structure, noting that what surprises clients most is the realisation that compliance is tied to process sequence, not only format. R3 described the typical project as a fit-gap analysis between a current state and a regulatory target state, where the final phase of alignment is consistently more demanding than the first. R4 approached it as a data-driven scoping exercise, identifying which data points exist in source systems and where gaps must be bridged. R5 characterised it as a regulated transformation of invoicing logic in which the definition of a completed invoice process is no longer entirely internal to the firm.

These accounts converge on one point. The transition is not primarily a technical substitution. It is a governance-induced redesign of how invoice data is structured, transmitted, validated, and reported. The case profiles in section 4.2 establish the governance architecture that produces these demands. The themes in section 4.3 give interpretive substance to how those demands are experienced in practice.

4.2 Document Analysis

The following subsections present the document-based case profiles for each selected jurisdiction. Each profile is structured around a common set of analytical dimensions: mandate scope and legal basis, transmission architecture and corner model type, validation authority and timing, reporting logic, format obligations, and interoperability mechanism. Each subsection closes with a single-sentence governance model classification. These profiles constitute the primary empirical material of the study and are derived from the document corpus described in section 3.3.

4.2.1 Italy

Italy established its B2G electronic invoicing mandate under Ministerial Decree 55 of 3 April 2013 (Decreto Ministeriale 3 aprile 2013, n. 55, hereafter DM 55/2013), which created the Sistema di Interscambio (SdI) as the national exchange infrastructure and introduced the FatturaPA XML format. Legislative Decree 127 of 5 August 2015 (Decreto Legislativo 5 agosto 2015, n. 127, hereafter D.Lgs. 127/2015) subsequently extended mandatory structured invoicing to all domestic B2B and B2C transactions, with full operational scope achieved from January 2019. The mandate applies to all VAT-taxable persons established in Italy, with limited exemptions.

The SdI constitutes a centralised exchange model in which the Agenzia delle Entrate operates as the sole routing and validation authority. Every invoice must be submitted to the SdI before it is forwarded to the buyer. The SdI performs syntactic and semantic checks prior to delivery, covering format conformance, field validity, certificate authenticity, and document uniqueness (Agenzia delle Entrate, 2026). An invoice that fails these checks is rejected and carries no legal validity, and it is not forwarded to the buyer. This pre-delivery validation constitutes de facto pre-clearance, even though Italy's model is technically classified as centralised exchange rather than clearance in the strict OpenPeppol and EESPA taxonomy (Kollmann et al., 2022). Reporting is structurally embedded in the exchange process: because all invoices traverse the SdI, the tax authority receives transactional data as an automatic by-product of transmission rather than through a separate reporting flow. Cross-border invoice data is submitted through the SdI channel under the obligation introduced by Article 1, paragraph 3-bis of D.Lgs. 127/2015, using the formats accepted by the system, thereby extending the centralised routing logic of the SdI to inbound and outbound cross-border supplies (D.Lgs. 127/2015). The mandatory format predates EN 16931 and is not compliant with it, which distinguishes Italy from all other selected jurisdictions that adopted mandates after 2017 (International Observatory on eInvoicing, 2025). Multiple transmission channels are available, including web services, PEC (*posta elettronica certificata*, certified email), SFTP, and API, but the SdI remains the single mandatory routing point regardless of channel choice.

Italy's governance arrangement classifies as a centralised exchange model with embedded pre-delivery validation and fiscal control through a single government platform, constituting the most centralised configuration among the selected cases.

4.2.2 France

The French B2B e-invoicing mandate is grounded in Article 26 of LOI n° 2022-1157 du 16 août 2022 de finances rectificative pour 2022, which inserted Articles 289 bis, 290, 290 A, and 290 B into the Code Général des Impôts. Article 289 bis establishes the obligation to issue, transmit, and receive invoices in electronic form for domestic B2B transactions between taxable persons established in France, through a plateforme de dématérialisation holding a registration number within the meaning of CGI Art. 290 B. In administrative practice these platforms are referred to as Plateformes Agréées (PA), a designation that replaced the earlier term Plateforme de Dématérialisation Partenaire (PDP) used during the planning phase of the reform; neither abbreviation appears in the statutory text itself. Article 290 B conditions the operation of such platforms on immatriculation by the tax administration, granted for three renewable years. Article 290 extends an e-reporting obligation to taxable persons established in France for transactions not falling under the domestic e-invoicing scope, including cross-border B2B and B2C supplies. Article 290 A adds a payment data reporting obligation covering amounts received for service transactions in scope under Articles 289 bis and 290 (LOI n° 2022-1157, 2022, Art. 26). The mandate rolls out in two phases by enterprise size: from 1 September 2026 for large enterprises and intermediate-sized enterprises (ETI, *entreprises de taille intermédiaire*), and from 1 September 2027 for SMEs and micro-enterprises. The obligation to receive electronic invoices applies universally from 1 September 2026 (LOI n° 2022-1157, 2022, Art. 26; International Observatory on eInvoicing, 2025).

The transmission architecture is the Y-model, a five-corner design in which the portail public de facturation (PPF) functions as the national central directory and fiscal data aggregator, while PAs serve as the mandatory routing path for all domestic B2B invoice exchange. Although CGI Art. 289 bis I references the PPF as an alternative submission route alongside a plateforme de dématérialisation, the French tax administration (Direction Générale des Finances Publiques, DGFIP) discontinued the PPF as a direct B2B emission and reception platform in October 2024; its operational role is now limited to maintaining the central directory and receiving fiscal data as Corner 5. Businesses must therefore use a PA for B2B invoice exchange; direct submission to the PPF is no longer available for that purpose. The PA forwards the commercial invoice to the buyer and transmits the required fiscal data to the PPF, which aggregates it for the administration (LOI n° 2022-1157, 2022, Art. 26). The national directory, maintained by the PPF, lists each recipient's e-invoicing address and designated PA, and senders route invoices according to this directory entry. The model does not operate as a clearance system: fiscal validity does not depend on government pre-approval prior to delivery to the buyer. Permitted formats are UBL 2.1, CII, and Factur-X, all EN 16931-compliant; non-stipulated syntaxes may be used bilaterally through a PA with format conversion prior to delivery (LOI n° 2022-1157, 2022, Art. 26; International Observatory on eInvoicing, 2025). The payment data reporting obligation under Article 290 A extends the mandate into payment process monitoring, requiring transmission of data on when payment was received for covered service transactions.

France's governance arrangement classifies as a decentralised CTC hybrid operating on a five-corner architecture, in which commercial exchange is routed exclusively through immatriculated private platforms and fiscal reporting flows to a government hub that functions as directory and data aggregator, without pre-delivery government clearance.

4.2.3 Belgium

Belgium's B2B e-invoicing mandate entered into force on 1 January 2026 under the Wet van 6 februari 2024, which inserted Article 53 §2bis into the Wetboek van de belasting over de toegevoegde waarde (Wet van 6 februari 2024). The obligation applies when both supplier and customer are established in Belgium and the customer is obliged to communicate its Belgian VAT number; transactions exempt under Article 44 WBTW are excluded. Article 53 §2bis was subsequently amended by the legislative instrument of 2025 to 2026 to refine scope conditions and introduce a fallback provision for cases of technical impossibility of reception (Belgian Chamber of Representatives, 2025). The transmission architecture is specified in Article 13ter of Koninklijk besluit nr. 1, as inserted by the Koninklijk besluit van 8 juli 2025: invoices must conform to the European standard for electronic invoicing within the meaning of Directive 2014/55/EU and be transmitted via Peppol or another secure transmission network meeting that standard; parties may bilaterally agree on a different EN 16931-compliant format and channel (Koninklijk besluit van 8 juli 2025, Art. 13ter).

The transmission architecture is a four-corner network model using the Peppol infrastructure, with FPS BOSA (Federale Overheidsdienst Beleid en Ondersteuning) acting as the Belgian Peppol Authority under a service agreement with OpenPeppol (Belgian Chamber of Representatives, 2025). Invoice exchange is decentralised: no government platform intermediates the commercial exchange, and fiscal validity does not depend on government platform approval. The parliamentary preparation materials confirm that invoice data is shared with the Belgian tax administration in real time as a by-product of Peppol network

transmission (Belgian Chamber of Representatives, 2025), though the operative data-flow mechanism is not further specified in the enacted statutory or Royal Decree text as of the date of analysis. A near-real-time B2B reporting obligation is announced from 2028 in the federal coalition agreement but remains without operative legislative or technical specification.

Belgium's governance arrangement classifies as a decentralised network-interoperability model, in which fiscal exchange is conducted through a four-corner Peppol architecture without government platform intermediation, and transactional reporting beyond standard VAT returns is deferred to a planned but technically unspecified obligation from 2028.

4.2.4 Germany

Germany's mandatory B2B e-invoicing framework was introduced through the Wachstumschancengesetz of 27 March 2024, which amended Paragraph 14 of the Umsatzsteuergesetz (UStG) to redefine the electronic invoice and establish the phased mandate (Wachstumschancengesetz, 2024). The applicable administrative guidance is set out in two successive BMF-Schreiben: the BMF-Schreiben of 15 October 2024, published in the Bundessteuerblatt I at page 1320, and its successor of 15 October 2025, which updated and expanded the earlier guidance in several substantive respects (BMF, 2024; BMF, 2025). The obligation to receive structured electronic invoices for all domestic B2B transactions applies from 1 January 2025. Issuance obligations are introduced progressively, with transitional simplifications permitting continued use of other formats by mutual agreement, phased out through 2028. The mandate applies to taxable persons with a registered seat or establishment in Germany; purely VAT-registered entities without a domestic establishment are not in scope.

The framework specifies format requirements but prescribes neither a transmission channel nor a government validation platform. An e-invoice must conform to EN 16931 or be fully extractable into an EN 16931-compliant format (Wachstumschancengesetz, 2024). XRechnung, which constitutes the German CIUS of EN 16931, ZUGFeRD from version 2.0.1 excluding the MINIMUM and BASIC-WL profiles, and any other EN 16931-conformant European format including Peppol BIS Billing 3.0 and Factor-X are all permissible (BMF, 2024; BMF, 2025). Email remains a lawful transmission channel and EDI formats remain permissible where extraction to EN 16931 is technically feasible; parties may contractually agree on any permissible format. There is no government validation platform, no clearance authority, and no current transaction-level reporting obligation beyond the VAT return and EC Sales List. A domestic Meldesystem, a transactional digital reporting system intended to cover domestic B2B supplies, is planned for introduction from 2028 in alignment with ViDA, but its format, transmission architecture, and technical specification remain entirely undefined in any published official instrument as of the date of analysis (BMF, 2025; International Observatory on eInvoicing, 2025).

Germany is not alone in this condition. Belgium's planned real-time reporting obligation, announced for 2028 in the federal coalition agreement, similarly carries no operative legislative or technical specification at the time of analysis (Belgian Chamber of Representatives, 2025; International Observatory on eInvoicing, 2025). Both cases present the same structural situation: a legally signalled obligation without a published technical architecture. The analytical difference is one of degree rather than kind.

Germany's Meldesystem uncertainty operates against a backdrop of a fully operative format mandate, giving enterprises one confirmed architectural anchor. Belgium's reporting obligation is announced against a background where the exchange model is already operationally specified through Peppol (Koninklijk besluit van 8 juli 2025, Art. 13ter). In both cases enterprises cannot make architecture decisions relative to the future reporting obligation, but the existing operational context differs in ways that affect how consequential that uncertainty is in the near term.

Germany's governance arrangement classifies as a format mandate without transmission architecture specification: no CTC model is currently operative, and the planned Meldesystem carries no published technical specification, meaning enterprises cannot make architecture decisions relative to a future domestic reporting obligation.

4.2.5 Hungary

Hungary's digital invoice governance is constituted primarily by the real-time invoice data reporting obligation established under Schedule 10 of Act CXXVII of 2007 on Value Added Tax and operationalised through Decree No. 23/2014 (VI.30.) NGM of the Minister for National Economy on the tax identification of invoices and receipts and on the supervisory audit of electronically stored invoices (NGM Rendelet 23/2014, hereafter Decree 23/2014). The obligation is administered by the National Tax and Customs Administration (NTCA) through its Online Invoice system. The mandate covers almost all domestic transactions issued by VAT-registered taxable persons, with only limited exceptions.

Hungary's system is a real-time invoice reporting model in which invoice data must be transmitted to the NTCA immediately and automatically by invoicing software through a machine-to-machine interface, or within four days for manually issued invoices, reduced to one business day where the VAT amount reaches or exceeds HUF 500,000 (Act CXXVII of 2007, Schedule 10; Decree 23/2014; NTCA, 2026). The reporting obligation operates in parallel to commercial exchange: the NTCA receives transactional data but does not route, clear, or validate the commercial invoice between trading parties. There is no mandatory e-invoicing exchange format for domestic B2B transactions beyond the energy sector; the exchange channel and document format for the commercial invoice remain at the parties' discretion, and paper invoices remain the statutory default for exchange purposes (Act CXXVII of 2007, Schedule 10; International Observatory on eInvoicing, 2025). No general B2B mandatory e-invoicing exchange mandate existed, and no legislative draft had been published as of the date of analysis. Hungary's reporting model is assessed as likely broadly compatible with the envisaged ViDA digital reporting standard without requiring a full systemic redesign, though detailed impact assessment remains contingent on the finalisation of ViDA implementation specifications (Merkx & Gruson, 2025).

Hungary's governance arrangement classifies as a real-time invoice reporting model, in which a mandatory and near-universal transactional data reporting obligation coexists with an absence of any mandatory e-invoice exchange format or exchange-path requirement, making it the most reporting-intensive but exchange-unspecified configuration among the selected cases.

4.3 Identified Themes

The case profiles presented above constitute the primary documentary basis of the study. The following section presents the interview-based themes developed through the second cycle of analysis, read in relation to the governance arrangements documented above.

The following themes were identified through interpretive analysis of the expert interview material, conducted as a complementary interpretive layer alongside the document analysis presented in section 4.2, carrying independent analytical weight in the development of the themes rather than serving only to confirm the documentary findings. The interview analysis began with In Vivo Coding to stay close to the respondents' own language in the first cycle of coding (Saldaña, 2011). These first-cycle expressions were then grouped into broader interpretive categories and refined into five higher-level themes: Regulation as embedded in information systems (RIS), EU regulatory framework, harmonisation, and divergence (ERF), Standards, interoperability, and persistent fragmentation (SAC), Transmission architectures and governance model effects (TAG), and Enterprise integration implications and identified gap (EIG). The structure of this section follows the analytical logic developed in the theoretical framework and is read in relation to the documentary findings established in section 4.2. Where interview material reinforces, qualifies, or adds operational texture to the document-based findings, this is noted within each theme.

To increase transparency in how the interview material is organised analytically, Table 6 presents the coding structure used to move from initial In Vivo Coding to broader interpretive themes. The Elements column identifies the specific respondent quotations, referenced by respondent number and sequential quote index (e.g. R1:1 denotes the first quoted passage from Respondent 1), that ground each subcode empirically. These references correspond directly to the quoted passages appearing in sections 4.3.1–4.3.5 below.

Table 6: Coding Structure

Theme Code	Theme Description	Sub Code	Sub Code Description	Elements
RIS	Regulation as embedded in information systems	RGI	Regulation governing invoice generation, exchange, validation, and reporting through system design, including invoice validity conditions and process sequencing	R1:1, R1:2, R1:3, R2:1, R2:2, R3:1, R5:1, R5:2, R5:3
		ARF	Architectural rigidity and flexibility under different regulatory settings	R1:4, R2:3, R3:2

Theme Code	Theme Description	Sub Code	Sub Code Description	Elements
ERF	EU regulatory framework, harmonisation, and divergence	NVD	National variation and divergence under shared EU harmonisation direction	R1:5, R2:4, R3:3, R3:4, R4:1
		VID	ViDA as a driver of future implementation planning	R1:6, R2:5, R3:5
SAC	Standards, interoperability, and persistent fragmentation	FRG	Shared standards and persistent implementation fragmentation	R3:6, R5:4, R5:5
		CIU	Country-specific implementation specifications and interoperability challenges	R3:7, R4:2, R4:3, R5:6
TAG	Transmission architectures and governance model effects	CEN	Centralised clearance and authority-centred models	R1:7, R2:6
		DEC	Decentralised, reporting-based, and network-oriented models	R1:8, R2:7, R4:4, R5:7
		GOV	Governance-model consequences for enterprise design and control	R5:8, R5:9, R5:10
EIG	Enterprise integration implications and identified gap	ERP	ERP-related adaptation challenges and middleware dependence	R1:9, R1:10, R1:11, R2:8, R4:5, R5:11, R5:12
		SHA	Shared versus country-specific architecture	R1:12, R2:9, R3:8, R3:9, R4:6

Theme Code	Theme Description	Sub Code	Sub Code Description	Elements
		OPC	Operational consequences including exceptions, monitoring, reconciliation, and correction handling	R1:13, R2:10, R3:10

4.3.1 Regulation as embedded in information systems (RIS)

A central pattern in the interview material is that regulation is not described as something external to implementation, but as something embedded in the process itself. This is consistent with the document profiles in section 4.2, which show that obligations in each jurisdiction are operationalised through these same technical mechanisms rather than declared separately from system design. The interview material gives this structural observation practical substance: respondents described implementation as something shaped directly by system rules, process logic, validation requirements, and reporting design. Two subcodes structure the findings in this section.

Regulation governing invoice generation, exchange, validation, and reporting (RGI)

Respondents across all roles described regulation as something encountered inside the process rather than checked against it afterwards. R1 described implementation as "a regulatory implementation process carried out through technology and organisational change" (R1:1), while R2 stated that regulation changes "what counts as acceptable process design" (R2:1). R3 noted that legal rules often become visible only later in the project, when "the legal requirements suddenly become very, very restrictive, because you realise in the details that something is not working" (R3:1). For R5, this dynamic meant that "invoicing stops being only a business-controlled process" (R5:1), with regulation "built into message structures, transmission paths, validation sequences, platforms, access points, identifiers, and reporting requirements" (R5:2).

This pattern becomes particularly visible in how respondents described invoice validity as increasingly conditioned by external validation, acknowledgement, or reporting logic, rather than determined solely within the ERP. R1 pointed out that "many companies assume the invoice is complete once it is posted in the ERP. But in mandatory e-invoicing that is often not enough. The invoice may need to pass external validation, be accepted by a platform, or trigger reporting acknowledgements" (R1:2). R5 reinforced this: "what counts as a finished invoice process is no longer defined only by the company itself" (R5:3). Respondents also described how process sequencing is conditioned by regulation rather than left to organisational design. R1 noted that "regulatory deadlines can force projects to prioritise compliance over elegance. That means some organisations accept temporary workarounds or country specific fixes because the legal date cannot move" (R1:3), while R2 highlighted that what surprises clients most is often the realisation that "compliance is tied to process sequence, not only format" (R2:2). Together, these accounts show that firms do not simply implement technical solutions and then check compliance. Compliance is already built into message structures, validation sequences, exchange routes, and reporting timelines.

Architectural rigidity and flexibility under different regulatory settings (ARF)

The interviews also reveal how different regulatory settings shape the degree of architectural rigidity or flexibility available to firms. R1 observed that "in strongly centralised models, flexibility is lower because the external process is already heavily defined" (R1:4), while R2 emphasised that "legal flexibility sets the outer boundary, but organisational maturity determines the actual room to move" (R2:3). R3 added a particularly telling observation from the German context: "in Germany, many clients actually find the leeway burdensome. They would have preferred it if the state had said: you use this format, this channel, and this platform" (R3:2). This suggests that regulatory openness does not automatically translate into perceived flexibility. When firms lack strong internal governance or process maturity, more open mandates can produce decision uncertainty that is experienced as more burdensome than a prescriptive regime. The interviews therefore do not treat regulation as uniformly restrictive or enabling but show that different forms of regulatory intervention produce different consequences for enterprise flexibility depending on both the governance model and the firm's internal readiness.

4.3.2 EU regulatory framework, harmonisation, and divergence (ERF)

A second major theme concerns the coexistence of a shared EU direction and persistent national divergence. The case profiles in section 4.2 establish that each of the five selected jurisdictions has developed governance arrangements that differ substantially in validation authority, reporting timing, and transmission logic, despite operating within a common supranational framework. Respondents corroborated this from an implementation perspective, describing the e-invoicing landscape not as one common European model but as a fragmented field in which shared policy direction coexists with different national arrangements, priorities, and implementation logics. Two subcodes structure the findings in this section.

National variation and divergence under shared EU harmonisation direction (NVD)

Respondents recognised a broader European movement toward structured e-invoicing and digital reporting but were consistent in noting that this shared direction has not produced a uniform implementation landscape. R3 observed that the countries now entering mandatory B2B e-invoicing tend to be "adopting EN-compliant formats from the outset, with an eye already on the 2030 horizon" (R3:3), reflecting convergence at the semantic level. Yet this common direction does not remove national divergence in governance design. R1 described the main differences as rooted in "where control is exercised, when the invoice is treated as valid, how much of the process is standard based versus platform based, and how tightly invoice exchange is linked to tax reporting" (R1:5). R2 characterised the variation similarly: "the main differences are in where the control point sits, how tightly invoice exchange is connected to tax reporting, how centralised the technical channel is, and how much country specific interpretation remains despite shared standards" (R2:4). R3 highlighted a structural divergence in sequencing approach: "Germany wants to introduce them one after the other, e-invoicing first and e-reporting later, and is relatively alone in this approach" (R3:4). These differences are not presented only as matters of formal law, but as variation in implementation conditions, architectural demands, and process sequencing that firms experience concretely. R4 grounded this in the practical reality of compliance deadlines: "if the mandate is out there, it is not really flexible. If there is a deadline, for example, if you look at France, whereas of September this year or next year you must send e-invoices depending on the size of the

company, that is a hard deadline" (R4:1). This illustrates how scope, rollout timing, and legal obligation translate into non-negotiable conditions that shape implementation urgency regardless of the shared EU direction.

ViDA as a driver of future implementation planning (VID)

ViDA emerged across the interviews as an important reference point for how organisations and practitioners are thinking beyond current national obligations. R1 noted that "most larger clients are treating ViDA as a strategic trigger rather than just another future deadline" (R1:6), and R2 echoed this: "most serious clients are already trying to understand what kind of long-term compliance capability they want" (R2:5). R3 added that clients in this position "would really like more clarity about what is coming next, because they want to factor that in now while they are making the switch anyway" (R3:5). In the interview material, ViDA therefore appears both as a future regulatory development and as a present structuring force in how implementation decisions are framed. Rather than being treated as something to address only once mandatory timelines arrive, it is already influencing how organisations evaluate their current architecture and whether their present country-specific solutions can scale into a broader European compliance framework.

4.3.3 Standards, interoperability, and persistent fragmentation (SAC)

A third major theme concerns standards and fragmentation. The document profiles show that EN 16931 is formally adopted or referenced across four of the five selected jurisdictions, yet national implementation arrangements diverge significantly at the levels of transmission architecture, validation authority, and interoperability mechanism. The interview material strongly supports the argument developed in chapter 2 that this semantic convergence does not produce a uniform implementation landscape: respondents acknowledged the value of standards but did not treat them as sufficient to eliminate governance-level fragmentation. Two subcodes structure the findings in this section.

Shared standards and persistent implementation fragmentation (FRG)

R5 articulated the central tension between the shared EU standard and the fragmented implementation reality: "EN 16931 gives a shared semantic direction, and that absolutely matters. But it does not remove fragmentation in implementation. It helps with common structure, but it does not decide the transmission architecture, the validation locus, the reporting sequence, or the governance model" (R5:4). This distinction between semantic standardisation and governance-level fragmentation is central to the thesis's analytical argument. R5 attributed the persistence of fragmentation partly to structural path dependence: "countries do not start from the same point and do not optimise for the same priorities. They build on existing administrative structures, national platforms, reporting histories, and domestic policy preferences" (R5:5). R3 gave a concrete historical illustration: Italy's FatturaPA format has been in place for a long time, but it is "not EN-compliant because it predates the EN standard" (R3:6), making Italy structurally distinct from all other selected jurisdictions and demonstrating how early national design decisions can produce lasting divergence even within a harmonisation agenda. These accounts confirm that EN 16931 may have resolved the collective action problem at the level of semantic development, but that diffusion-level fragmentation persists because national governance arrangements continue to differ at the layers of validation, transmission, and fiscal control.

Country-specific implementation specifications and interoperability challenges (CIU)

Even where shared standards provide a common reference point, country-specific implementation requirements remain consequential and require distinct technical and procedural adaptation. R3 noted that experienced practitioners still find that "the regulations in the next country are actually very different in detail. And that is not always because of the e-invoicing regulations themselves. It may be because VAT legislation is somewhat different, or because the processes and the communication with tax authorities work differently" (R3:7). R4 gave a practical illustration of how national architectural specification translates into distinct implementation paths: "in Belgium, they say you have to use Peppol. In France, they say there is a list of approved providers that can support you" (R4:2), two structurally different approaches even where the underlying policy rationale for structured invoicing is shared. The practical consequence for firms is a concrete mapping challenge. R4 described how "the mapping exercise is quite interesting for companies, because they receive a target file from the provider and need to draw the lines between their source system and that target file" (R4:3). Interoperability itself was described in an ambivalent way, as both an enabling condition and a practical challenge. R5 pointed to a common misconception: Belgium "is sometimes seen as easier because it is linked to standards and interoperability, but that can also be misleading because interoperability does not remove the need for strong data, routing logic, and partner readiness" (R5:6). This nuance matters because it aligns with the theoretical argument that interoperability can increase architectural modularity in principle while still imposing significant enterprise preparation demands in practice.

4.3.4 Transmission architectures and governance model effects (TAG)

A fourth major theme concerns transmission architecture and governance-model effects. The case profiles in section 4.2 classified each jurisdiction along the corner model and CTC taxonomy developed in section 2.3: Italy as centralised exchange, France as decentralised CTC hybrid, Belgium as network-interoperability model, Hungary as real-time reporting model, and Germany as a format mandate without operative CTC architecture. The interview material aligns directly with these classifications. Respondents described differences not only in national rules but in how control and exchange are organised and what consequences each arrangement produces for enterprises. Three subcodes structure the findings in this section.

Centralised clearance and authority-centred models (CEN)

Centralised models were consistently described as providing stronger compliance certainty while also generating the strongest adaptation pressure. R1 described centralised models as creating "more immediate compliance certainty because there is one strong control point, but they often require deeper adaptation of invoice flows and system states" (R1:7). R2 characterised the same dynamic: "centralised models often create stronger certainty around what the external process expects, but they can create higher adaptation pressure because the company must align closely to the platform logic" (R2:6). This corresponds directly to the theoretical treatment of clearance and centralised exchange models, where control is inserted into or conditions the exchange path itself. In the interview material, that structural property is experienced as rigidity and reduced internal design freedom, but also as a clear external reference point that simplifies compliance verification once alignment is achieved.

Decentralised, reporting-based, and network-oriented models (DEC)

Decentralised and reporting-based models create a different allocation of burden rather than an easier implementation path. R1 observed that "decentralised or reporting based models can be easier to fit into existing landscapes, but they often shift the burden to internal governance, reconciliation, and provider coordination. In reporting-based models, the architecture may be more flexible, but the organisation must manage more of the compliance logic itself" (R1:8). R2 highlighted the diagnostic complexity that emerges in distributed environments: a problem "may sit in the ERP output, the middleware transformation, the access point, the reporting connector, or a provider rule. That makes root cause analysis more difficult" (R2:7). R5 described Hungary as the clearest instance of the reporting-intensive pattern, where "reporting-driven discipline can create heavy operational pressure" (R5:7) even without centralising the commercial exchange path. R4 added that decentralised settings can also encourage locally optimised rather than globally consistent choices: "if you have a really decentralised organisation, I can imagine companies saying that for them it would be fine to connect with a local solution and do it their own way" (R4:4), a pattern that simplifies short-term compliance but complicates later cross-country harmonisation.

Governance-model consequences for enterprise design and control (GOV)

Taken together, the patterns described above point to governance-model type as the central explanatory variable in this theme. R5 made the core observation: "governance-model type makes a huge difference, because that is what shapes how the obligation becomes a system and process problem inside the organisation" (R5:8). This was illustrated concretely across the three countries R5 knew most closely: "Italy shows how centralised control can shape the invoice lifecycle very strongly. Hungary shows how reporting-driven discipline can create heavy operational pressure. Belgium shows that interoperability and network logic can still require serious preparation even when the model feels less centralised" (R5:9). The underlying conclusion is that "the burden shifts rather than disappears" (R5:10). This formulation is analytically important because it captures the comparative insight at the core of this thesis: it is not the existence of a mandate that determines the enterprise integration challenge, but the governance model through which that mandate is operationalised.

4.3.5 Enterprise integration implications and identified gap (EIG)

The fifth and final theme concerns the enterprise integration implications of regulatory variation. The cross-case comparison in section 4.2 shows that each governance model generates a structurally distinct integration surface: Italy's centralised validation conditions the invoice lifecycle end to end; France routes exchange through immatriculated private platforms while separating fiscal reporting to a government hub; Belgium delegates both exchange and compliance to a Peppol-based network; Hungary imposes reporting obligations without constraining the exchange path; Germany specifies formats without prescribing transmission or reporting architecture. The interview material strongly supports the gap formulation in Table 1 and gives it operational substance, documenting how these structural differences translate into ERP configuration demands, middleware dependencies, and compliance burden. Three subcodes structure the findings in this section.

ERP-related adaptation challenges and middleware dependence (ERP)

ERP landscapes and middleware dependencies featured prominently across all interviews as both practical obstacles and structural risk factors. R1 identified the area's most directly affected as "data mapping, invoice creation logic, transmission design, validation handling, reporting, and archiving" (R1:9), and pointed to a recurring blind spot: "credit notes and corrections are often forgotten at the beginning" (R1:10) and typically surface only when real transaction volume begins. R2 identified the structural root of many ERP difficulties: "if the ERP is old, heavily customised, or fragmented across subsidiaries, compliance becomes much harder because the necessary data may not exist in consistent form" (R2:8). R4 pointed to data centralisation as the key architectural precondition: "it would help if you have a central layer in your system where you can centralise all the data" (R4:5).

Middleware was discussed in similar terms, as a tool for absorbing country-specific logic that nonetheless introduces its own risks. R1 warned that "if too much regulatory logic sits outside the ERP, business users may lose visibility. They may not understand why an invoice failed because the error is happening in an external transformation layer" (R1:11). R5 reinforced this: "middleware can improve flexibility, but it can also reduce visibility and increase strategic dependence" (R5:11), adding that "provider lock-in and middleware lock-in are real concerns, especially when a company begins with one country and later tries to scale into others" (R5:12). These accounts give concrete empirical form to the gap identified in chapter 2: the issue is not merely whether middleware is used, but how governance divergence across jurisdictions produces different forms of middleware dependence and orchestration complexity that prior single-country research has not captured.

Shared versus country-specific architecture (SHA)

The tension between shared architecture and country-specific adaptation was one of the most consistent topics across the interviews, and it maps directly onto the governance-model variation documented in section 4.2. R1 confirmed that "most enterprises want a shared architecture, especially if they operate in several countries. But in practice, many end up with a hybrid solution" (R1:12). R2 described the typical outcome: "most larger enterprises aim for a shared architecture with country specific configuration layers" (R2:9). R3 described the ideal starting point as designing for multiple countries from the outset: "if you know you will be affected in multiple countries in the coming years, you take all of these countries into account from the very beginning and set up an architecture that can integrate them as seamlessly as possible" (R3:8). In practice, however, "most companies really do proceed by starting with a small group of priority countries and managing the rest afterwards" (R3:9), which creates accumulating country-specific layers that complicate later harmonisation. R4 confirmed that strategic preference at senior level still tends toward centralisation: "the real decision makers prefer to have one system in place that covers e-invoicing across the company" (R4:6). The gap between that preference and the hybrid reality that tends to emerge is itself a product of governance divergence: architectural decisions made for one governance model do not transfer cleanly to another, and shared solutions typically require country-specific layers that accumulate over time.

Operational consequences including exceptions, monitoring, reconciliation, and correction handling (OPC)

Beyond design and integration choices, the respondents pointed to a class of consequences that extends implementation well beyond technical go-live. R1 noted that post-go-live issues including "rejections, duplicate submissions, customer disputes, mismatched statuses between ERP and external platforms, and missing archive evidence can quickly become daily operational issues" (R1:13). R2 highlighted reconciliation as a structural challenge that arises wherever the ERP and external compliance environments do not share a single authoritative state: "reconciliation becomes important when the ERP view and the external compliance view are not identical" (R2:10). R3 identified procedural redesign as "the third challenge, and the most underestimated" (R3:10), noting that firms often discover only after technical implementation is complete that their existing internal processes do not align with the regulated invoice flow. These findings are significant because they extend the integration problem beyond architecture into sustained operations. Governance variation affects not only design-time integration decisions, but the ongoing operational burden of sustaining compliance under real transaction volume, exception conditions, and regulatory change. This gives further empirical support to the identified gap in prior research, which has focused more on adoption and single-country ERP integration than on the cross-jurisdictional operational consequences that emerge from governance-model variation.

5 Discussion

The Results chapter established how governance arrangements differ structurally across the five selected jurisdictions and documented how implementation professionals experience those differences in practice. The following sections interpret these findings in relation to the theoretical framework developed in Chapter 2. Where the Results chapter moved from governance architecture to implementation consequence, the Discussion moves in the reverse direction, from implementation consequence to theoretical proposition. Section 5.1 addresses the RIS and TAG findings together. Section 5.2 addresses ERF and SAC. Section 5.3 grounds the identified research gap in the EIG findings. Sections 5.4 and 5.5 address unexpected findings and contributions respectively.

5.1 Regulation as enacted through governance models

The RIS and TAG findings together confirm and extend the theoretical position that mandatory B2B e-invoicing governance constitutes a case of regulation through information systems in the sense defined by Butler et al. (2023). Across all five interviews, respondents described regulation not as something verified externally after technical implementation, but as something materially present inside message structures, validation sequences, transmission paths, and reporting timelines. R5's formulation is the most direct: "the regulation is not just in a legal text that you check later. It is built into message structures, transmission paths, validation sequences, platforms, access points, identifiers, and reporting requirements" (R5:2). R1 reinforced this from a project management perspective, noting that "regulatory deadlines can force projects to prioritise compliance over elegance. That means some organisations accept temporary workarounds or country specific fixes because the legal date cannot move" (R1:3). This is precisely what Butler et al. (2023) mean when they argue that regulatory compliance in this domain is enacted through information systems rather than applied to them from outside. The document analysis in section 4.2 confirms this at the governance level, where validation authority, reporting timing, and transmission routing are embedded in national legislative instruments rather than left to enterprise discretion. The interview findings in section 4.3 confirm it as a lived enterprise reality.

The TAG findings add the mechanistic dimension that the theoretical framework anticipates through Henningsson and Eaton's (2023) interface/activity specification distinction. Governance model type does not simply determine the legal conditions of invoice validity. It shapes the structure of the implementation challenge enterprises face. As R5 observed, "governance-model type makes a huge difference, because that is what shapes how the obligation becomes a system and process problem inside the organisation" (R5:8). Italy's SdI operates as an activity specification: every invoice must traverse a government platform before delivery, prescribing the process itself, removing internal design freedom, and demanding close alignment to external platform logic (R1:7; R2:6).

Belgium's Peppol-based architecture operates as an interface specification: it defines interaction rules without mandating a single exchange platform, preserving more architectural modularity for the enterprise. France's Y-model introduces a hybrid position, routing commercial exchange through certified private platforms while fiscal data flows separately to a government aggregator. Hungary's RTIR model places the burden primarily on reporting timing and monitoring discipline rather than exchange-path conformance. These are not

gradations of a single problem. They are structurally different configurations that produce qualitatively different enterprise integration surfaces. As R5 summarised: "Italy shows how centralised control can shape the invoice lifecycle very strongly. Hungary shows how reporting-driven discipline can create heavy operational pressure. Belgium shows that interoperability and network logic can still require serious preparation even when the model feels less centralised" (R5:9), leading to the formulation that "the burden shifts rather than disappears" (R5:10).

The RIS/ARF subcode introduces a qualification the theoretical framework did not fully anticipate. The relationship between regulatory openness and enterprise flexibility is not straightforward. R2 observed that "legal flexibility sets the outer boundary, but organisational maturity determines the actual room to move" (R2:3). Even where regulation operates as an interface specification, leaving internal design more open in principle, organisations lacking the governance capacity to exploit that freedom do not experience it as genuinely flexible. This qualification is developed further as an unexpected finding in section 5.4 and as a theoretical extension in section 5.5.

5.2 The limits of harmonisation as a convergence mechanism

The ERF and SAC findings confirm that the EU harmonisation agenda has resolved the development dilemma identified by Markus et al. (2006), a shared semantic standard exists in EN 16931 without resolving the diffusion dilemma. National governance arrangements remain divergent at the layers the semantic standard does not govern: validation authority, transmission architecture, reporting timing, and fiscal control logic. R5 articulated this with analytical precision: "EN 16931 gives a shared semantic direction, and that absolutely matters. But it does not remove fragmentation in implementation. It helps with common structure, but it does not decide the transmission architecture, the validation locus, the reporting sequence, or the governance model" (R5:4). R1 described the practical consequence: even where companies recognise a common European direction, "the main differences are where control is exercised, when the invoice is treated as valid, how much of the process is standard based versus platform based, and how tightly invoice exchange is linked to tax reporting" (R1:5). The five case profiles in section 4.2 give this observation its full empirical weight. Each selected jurisdiction satisfies or is moving toward EN 16931 compliance at the semantic level, yet each presents a structurally distinct governance arrangement with different implications for enterprise integration. This finding is consistent with the European Commission's (2024) own documentation that national Core Invoice Usage Specifications have become a source of fragmentation rather than harmonisation, requiring enterprises to maintain separate technical implementations even where the shared standard is formally adopted.

Modol and Eaton's (2021) concept of generative entrenchment explains why diffusion has stalled at the governance level even as semantic convergence has progressed. Italy's case is the clearest illustration. R3 noted that the FatturaPA format "is not EN-compliant because it predates the EN standard" (R3:6), making Italy structurally distinct from all other selected jurisdictions. Early infrastructure commitments, a national exchange platform operational since 2013, with deep integration into fiscal administration and create path dependence that resists later convergence even where the supranational policy direction is shared.

The pattern extends across the other cases. France's Y-model reflects national fiscal administration preferences developed before ViDA. Hungary's RTIR obligation reflects a domestic tax authority infrastructure built independently of any EU harmonisation instrument. Belgium's Peppol commitment reflects a national policy choice aligned with interoperability norms that predate the current harmonisation framework. R5 grounded this in structural terms: 'countries do not start from the same point and do not optimise for the same priorities. They build on existing administrative structures, national platforms, reporting histories, and domestic policy preferences' (R5:5). Each case confirms that divergence is not a regulatory accident but the product of national infrastructure investment choices that generative entrenchment makes difficult to reverse.

ViDA, constituted by Council Directive 2025/516, Regulation 2025/517, and Implementing Regulation 2025/518, does not fully resolve this dynamic. The ERF/VID findings show that practitioners treat ViDA as a strategic planning horizon rather than a present resolution of divergence. R1 noted that "most larger clients are treating ViDA as a strategic trigger rather than just another future deadline" (R1:6), and R3 captured the structural tension: clients "would really like more clarity about what is coming next, because they want to factor that in now while they are making the switch anyway" (R3:5). Council Directive 2025/516 advances harmonisation at the semantic and reporting level while preserving space for domestic governance arrangements alongside the cross-border framework. The European Commission's (2025) own call for evidence on revising the eInvoicing Directive acknowledges that further harmonisation remains necessary precisely because the current landscape continues to create interoperability problems for cross-border operators. The development problem has been progressively addressed. The diffusion problem has been deferred rather than dissolved.

Germany's classification as a format mandate without operative reporting architecture, where the planned Meldesystem carries no published technical specification in any official instrument, represents a particularly consequential finding in this context. The Meldesystem, announced for 2028, carries no published technical specification in any official instrument as of the date of analysis. This creates a form of regulatory uncertainty structurally distinct from the governance divergence documented across the other four cases. Italy, France, Belgium, and Hungary each present different governance models with clear, if demanding, architectural implications for enterprises. Germany presents an absence of a model for the planned reporting obligation, leaving enterprises unable to make architecture decisions against an obligation that has no technical form. Prior IS research on regulatory fragmentation, including Wurzer and vom Brocke (2025), addresses divergence across jurisdictions as the primary challenge. Germany's case adds a temporal dimension: regulatory indefiniteness as a design-time constraint that blocks rather than merely complicates enterprise architecture planning. This finding extends the regulatory fragmentation concept beyond the cross-jurisdictional spatial dimension into a temporal one, and represents a novel analytical contribution discussed further in section 5.5.

5.3 Cross-jurisdictional enterprise integration and the identified research gap

The EIG findings give direct empirical substance to the gap identified in section 2.4. Prior IS-situated research on e-invoicing, including Baumeister and Volkmann (2025), Hoblos et al. (2024), and Bani Ahmad (2024) engages with ERP integration and technical adaptation but treats integration demands as technically given within a single mandate setting. The present findings show that integration demands are not technically given. They are shaped by governance model type, and the variation across jurisdictions produces demands that differ in kind, not merely in degree.

The ERP subcode findings illustrate this systematically. R1 identified the directly affected areas as "data mapping, invoice creation logic, transmission design, validation handling, reporting, and archiving" (R1:9), while R2 confirmed the structural root of many ERP difficulties: "if the ERP is old, heavily customised, or fragmented across subsidiaries, compliance becomes much harder because the necessary data may not exist in consistent form" (R2:8). But the weight given to each area differs by country in ways that reflect the underlying governance model. Validation handling and invoice status management are the dominant challenges in centralised models such as Italy, where external platform rejection carries legal consequences for invoice validity and requires complex status reconciliation between internal ERP states and external compliance outcomes. Reporting integration and timing discipline dominate in Hungary's RTIR environment, where the sequencing of internal posting relative to mandatory reporting deadlines is itself a compliance variable. Interoperability, routing logic, and partner readiness dominate in Belgium's Peppol environment. These are qualitatively different integration surfaces produced by different governance-model types, which is precisely what single-country research cannot reveal, and precisely what the identified gap said was missing.

The middleware dimension of the ERP subcode adds a further layer to this. Middleware is consistently described as a tool for absorbing country-specific regulatory logic outside the ERP core, useful precisely because governance divergence makes a single ERP-native solution insufficient for multi-country compliance. Yet middleware introduces its own structural risks. R5 noted that "middleware can improve flexibility, but it can also reduce visibility and increase strategic dependence" (R5:11), and R1 warned that when too much regulatory logic sits outside the ERP, business users lose the ability to understand why invoices fail (R1:11). Provider lock-in and middleware lock-in (R5:12) are strategic consequences of governance model choices rather than purely technical decisions. A solution that handles one country's governance logic may not extend to another where the integration surface differs fundamentally. This is consistent with Hanseth and Modol's (2021) argument that architecture-governance configurations are not interchangeable, and with Arvidsson et al.'s (2014) position that IS implementation is a strategic practice shaped by contextual conditions that in this domain are primarily set by governance model type.

The SHA findings document a gap between strategic aspiration and operational reality that is itself a consequence of the governance divergence established in section 4.2. Firms consistently express a preference for shared architecture (R1:12; R4:6). Practitioners recommend designing for multiple countries from the outset (R3:8). In practice, a hybrid outcome emerges with a shared core with accumulating country-specific configuration layers, because architectural decisions made for one governance model do not transfer cleanly to

another. R3 captured the typical trajectory: "most companies really do proceed by starting with a small group of priority countries and managing the rest afterwards" (R3:9), which creates layers that complicate later harmonisation. This accumulation is not primarily a project management failure. It is the structural consequence of governance divergence that makes full architectural standardisation across different model types operationally unsustainable under real implementation conditions.

The OPC findings extend the integration problem beyond design-time into sustained operations, an aspect largely overlooked in prior domain research. R1's account of post-go-live consequences "rejections, duplicate submissions, customer disputes, mismatched statuses between ERP and external platforms, and missing archive evidence can quickly become daily operational issues" (R1:13) shows that the integration challenge does not end at technical go-live. R2 highlighted that reconciliation becomes structurally necessary "when the ERP view and the external compliance view are not identical" (R2:10), and R3 identified procedural redesign as "the third challenge, and the most underestimated" (R3:10), noting that existing internal processes frequently do not align with regulated invoice flows in ways that only become apparent under real transaction volume.

These operational burdens are distributed differently across governance models: centralised models such as Italy's concentrate the burden at the validation and rejection handling layer; reporting-intensive models such as Hungary's concentrate it at the timing and monitoring layer. Governance model variation therefore shapes not only how systems are designed but how compliance burdens are distributed across the operational lifecycle of those systems.

5.4 Unexpected findings and their theoretical implications

Two findings in the empirical material were not directly anticipated by the theoretical framework and merit explicit discussion. The first is what can be termed the leeway burden paradox, documented in the German context. R3 reported that many clients "actually find the leeway burdensome. They would have preferred it if the state had said: you use this format, this channel, and this platform" (R3:2), adding that "the more leeway is given, the more burdensome it is perceived to be." This is counterintuitive against the standard assumption that regulatory openness enables enterprise flexibility. The Henningsson and Eaton (2023) framework predicts that interface specifications preserve architectural modularity and should therefore be experienced as less constraining than activity specifications. That prediction holds at the level of regulatory design. What the German evidence adds is that when organisational maturity is insufficient, the specification problem is not eliminated by regulatory openness but transferred to the firm. Because this finding rests primarily on the German case and on R3's account, it is advanced here as a proposition warranting further empirical investigation rather than as an established cross-jurisdictional finding. Its generalisability beyond the German context, and beyond the advisory perspective of the present sample, remains to be tested.

The firm must now specify what the regulation left open, without necessarily having the governance capacity to do so consistently. R3 observed that companies "artificially narrow the leeway because they cannot cope with the freedom", self-imposing constraints that reduce their practical design room to that of a more prescriptive model. R2 described the same dynamic more abstractly: "legal flexibility sets the outer boundary, but organisational

maturity determines the actual room to move" (R2:3). This finding is discussed as a theoretical extension in section 5.5 and carries a policy implication that extends beyond IS research: mandates designed to be open and flexible may disproportionately burden less-prepared enterprises, which are often the organisations that would benefit most from clearer regulatory prescription.

The second unexpected finding concerns the consulting-role composition of the interview sample and its interpretive consequences. All five respondents hold advisory or consulting roles, supporting organisations on implementation rather than implementing e-invoicing systems themselves as in-house enterprise teams. Advisory practice tends to surface cases of complexity, misalignment, and inadequate preparation, the situations in which clients seek external support, rather than cases where implementation proceeded with limited difficulty. The EIG findings, and the OPC subcode in particular, should be read with this interpretive context in mind. The operational consequences documented in section 4.3.5 are likely common in practice, but whether they represent the typical implementation experience or the more demanding subset that reaches advisory professionals cannot be established from this sample alone. This dynamic can be understood through the lens of what Orlikowski and Gash (1994) term technological frames: the shared professional background of the respondents constitutes a frame that foregrounds implementation complexity, client unpreparedness, and architectural risk, the situations that define their professional practice, while backgrounding cases where implementation was routine or straightforward. This does not invalidate the analysis, since the research question concerns how governance model variation shapes implementation conditions rather than how frequently implementation encounters difficulty. It does, however, suggest that in-house implementer accounts from enterprise practitioners working as finance directors, ERP project managers, or tax technology leads inside implementing organisations would be a valuable complement that could establish the frequency and severity of the identified consequences more precisely, and would likely surface cases where governance model variation was navigated more smoothly than the present advisory perspective suggests is typical.

5.5 Contributions to IS research

The findings presented in this thesis contribute to IS research on regulation, digital infrastructure, and enterprise integration in three interconnected respects. The first contribution is empirical. This study produces the first systematic IS-oriented comparative governance profile of five EU Member States structured around a common analytical framework derived from the corner model taxonomy and CTC typology established in sections 2.3 and 2.4. Prior domain research has examined e-invoicing as a single-country adoption or tax administration outcome question. The present study organises five jurisdictions around a shared set of IS-relevant analytical dimensions, transmission architecture, validation authority, reporting timing, format obligations, interoperability mechanism, and uses that framework to show how governance model variation produces structurally different enterprise implementation conditions. The result is both an organised empirical basis for future comparative IS research in this domain and a demonstration that governance model type, not the presence of a mandate in general, is the variable that matters most for enterprise integration.

The second contribution is conceptual. The study extends Butler et al.'s (2023) framework by applying Henningsson and Eaton's (2023) interface/activity specification distinction systematically across multiple national governance arrangements. Prior work using these frameworks has not examined how different specification types distribute enterprise integration burdens differently across jurisdictions. The present findings show that the type of specification, interface versus activity determines not only the degree of architectural adaptation required but the kind of challenge the organisation faces: whether that challenge is concentrated in validation handling and invoice status management, reporting timing and monitoring, or interoperability and routing logic. This extends the theoretical framework in a direction that is directly relevant to any domain where regulatory compliance is operationalised through digital platforms, standards, and mandatory data exchange requirements.

The study also makes a theoretical extension beyond what the framework anticipated. The leeway burden paradox documented in the German context, where regulatory openness is experienced as more burdensome by less mature organisations, extends Henningsson and Eaton's (2023) interface/activity distinction by adding an organisational maturity condition. An interface specification at the regulatory level does not automatically produce flexibility at the enterprise level. Whether regulatory openness translates into architectural flexibility depends on whether the organisation possesses the internal governance capacity to exploit the design freedom. This extension has implications beyond e-invoicing: in any domain where regulatory design deliberately avoids prescription to allow flexibility, the distribution of implementation burden may follow organisational maturity rather than regulatory intent.

The third contribution concerns the treatment of Germany's governance arrangement as a case of temporal regulatory indefiniteness, where a legally established reporting obligation carries no published technical specification and therefore cannot be designed for. This classification goes beyond the existing corner model and CTC taxonomy by introducing temporal regulatory indefiniteness as a distinct form of implementation constraint. Prior IS research on regulatory fragmentation, including Wurzer and vom Brocke (2025) and Seidel et al. (2025), has theorised fragmentation primarily in cross-jurisdictional spatial terms. Germany's case shows that regulatory uncertainty can operate along a temporal dimension as well: a planned obligation with no published technical specification cannot be designed for, which constitutes a structurally different constraint from either a prescriptive mandate or an absent one. Enterprises subject to the Meldesystem obligation cannot make architecture decisions, even though the obligation is legally established. This classification may be relevant to other regulatory contexts in which implementation obligations are announced well in advance of technical specification, a pattern increasingly common in fast-moving digital governance domains.

6 Conclusion

This chapter brings together the main findings and contributions of the study in response to the research question. No new empirical material is introduced. The chapter states what the study has established, what it contributes to existing knowledge, and what it leaves open for future investigation.

6.1 Summary of findings

This thesis investigated how regulations affect the implementation process of mandatory B2B e-invoicing in the EU, and more specifically how variation in governance model type produces structurally different implementation demands across jurisdictions. The study pursued this question through a comparative document analysis of five EU Member States (Italy, France, Belgium, Germany, and Hungary), complemented by five semi-structured expert interviews conducted as a validation and refinement step. The findings show that regulations affect the implementation process primarily through the governance model in which they are operationalised, and that it is the type of governance arrangement, rather than the existence of a mandate as such, that determines the nature and scale of the implementation challenge.

The analysis produced several interconnected findings. First, regulation in the e-invoicing domain is not merely a legal backdrop to implementation. It is embedded in the process itself, operationalised through format specifications, validation sequences, transmission architectures, and reporting requirements. This makes e-invoicing governance a case of regulation through information systems rather than regulation applied separately from it, and it means that compliance is built into system structure rather than verified after the fact (Butler et al., 2023). Second, while the EU advances a common harmonisation agenda through instruments such as EN 16931 and Council Directive 2025/516, national governance arrangements remain substantially divergent beneath that shared direction. The five cases demonstrate that convergence at the semantic and policy level does not produce uniform implementation conditions at the level of architecture, validation authority, reporting timing, or interoperability design. The development problem identified by Markus et al. (2006) has been progressively addressed; the diffusion problem has been deferred rather than dissolved. Third, governance model type, rather than the presence or absence of a mandate in general, determines what the implementation challenge involves for enterprise systems. The five cases each generate structurally different demands on ERP configuration, middleware design, validation handling, monitoring, and operational compliance, as documented in the case profiles in section 4.2. Fourth, Germany's yet-undefined Meldesystem represents a form of regulatory uncertainty that is structurally distinct from governance divergence across the other four cases: a planned obligation with no published technical specification cannot be designed for, which constitutes a different constraint from either a prescriptive mandate or an absent one. Fifth, firms operating across multiple jurisdictions encounter compounding burdens, as architectural decisions made for one governance model do not transfer cleanly to another, and shared solutions typically require country-specific layers that accumulate over time.

The leeway burden paradox, documented in the German context, shows that regulatory openness does not automatically produce enterprise flexibility. When organisational maturity is insufficient, the specification problem is transferred to the firm rather than resolved. Firms

self-impose constraints that reduce their practical design room, and regulatory openness is experienced as more burdensome than a prescriptive regime would be. This qualifies Henningsson and Eaton's (2023) interface/activity distinction by adding an organisational maturity condition to the relationship between regulatory specification type and enterprise flexibility.

The all-consulting composition of the interview sample means the findings should be read through what Orlikowski and Gash (1994) term technological frames: the respondents' shared professional practice foregrounds cases of complexity and inadequate preparation, which is the subset of implementations that reaches advisory professionals, rather than cases where governance model variation was navigated more smoothly.

6.2 Contributions to IS research

The study contributes to IS research in three interconnected respects. Empirically, it produces the first systematic IS-oriented comparative governance profile of five EU Member States structured around a common analytical framework derived from the corner model and CTC taxonomies, providing an organised basis for understanding how governance model type, not the presence of a mandate in general, determines the nature of the enterprise integration challenge. Conceptually, it extends Butler et al.'s (2023) regulation through the IS framework by applying Henningsson and Eaton's (2023) interface/activity specification distinction systematically across multiple national governance arrangements, showing that specification type shapes not only the degree but the kind of challenge organisations face. It further extends that framework by showing that whether regulatory openness translates into architectural flexibility depends on organisational maturity rather than regulatory intent alone. This extension is offered as a theoretically motivated proposition grounded primarily in the German case, rather than as a settled empirical result, and is a candidate for systematic testing across jurisdictions and across in-house as well as advisory perspectives. Third, the thesis introduces temporal regulatory indefiniteness as a distinct form of implementation constraint, extending prior IS research on regulatory fragmentation, which has theorised fragmentation primarily in cross-jurisdictional spatial terms, by showing that an announced obligation with no published technical specification constitutes a structurally different design-time constraint. This classification may be relevant to other regulatory contexts in which implementation obligations are announced well in advance of technical specification.

6.3 Limitations

Several limitations apply. The study is qualitative and interpretive, and its analytical generalisations do not claim statistical representativeness. The interview component consists of five respondents, all in consulting or advisory roles, and serves a validation function rather than a generative one. The consulting-role composition means the findings most directly reflect the demanding subset of implementations that reaches advisory professionals, and the frequency and severity of the consequences documented in section 4.3.5 cannot be established from this sample alone.

The regulatory environments examined were each at different stages of specification and rollout at the time of data collection. Governance arrangements in France, Belgium, and Germany continue to evolve, and some classifications offered here may require revision as technical specifications are finalised. Document interpretation across multiple languages and

legal traditions introduces interpretive uncertainty that the methodological precautions described in section 3.3 mitigate but cannot fully eliminate. The analytical framework, derived primarily from IS and digital infrastructure literature, foregrounds architectural and integration consequences while potentially underemphasising legal nuance or tax policy considerations that a more doctrinally oriented study would surface. The study claims analytical transferability rather than statistical representativeness, and its propositions about governance model effects should be treated as starting points for further investigation rather than settled conclusions.

6.4 Practical implications

For organisations implementing mandatory B2B e-invoicing across multiple EU jurisdictions, the findings carry several implications worth stating directly. Governance model type, not the existence of a mandate in general, determines the nature and location of the integration challenge. Centralised models concentrate adaptation pressure at the validation and invoice-status management layer. Reporting-intensive models shift it to process sequencing and monitoring discipline. Network-oriented models distribute it across interoperability, routing logic, and partner readiness. These are not gradations of a single problem but structurally different challenges requiring different architectural responses.

Architectural decisions made for one governance model do not transfer cleanly to another, which means the accumulation of country-specific configuration layers is a structural consequence of governance divergence rather than a project management failure. Where a planned reporting obligation carries no published technical specification, as with Germany's Meldesystem and Belgium's announced 2028 reporting obligation, architecture decisions relative to that obligation cannot responsibly be made in advance. Deferring that investment until specification is available is analytically justified rather than a failure of preparation.

6.5 Future research

Future research could productively complement the present findings through in-house implementer accounts from enterprise practitioners, such as finance directors, ERP project managers, or tax technology leads inside implementing organisations, which would establish more precisely how commonly governance model variation creates the difficulties documented here. Quantitative assessment of the architectural adaptation costs associated with different governance model types would also be valuable, particularly once ViDA implementation specifications are finalised. Longitudinal study of whether early adopters such as Italy face higher or lower incremental adaptation costs than late movers aligning national and EU obligations simultaneously would shed light on the early-mover question raised by R3. Comparative study of how provider market consolidation shapes which formats and transmission channels become dominant in practice, independently of regulatory prescription, would address the market-power dimension that the interview material identifies as a significant but under-theorised force in implementation outcomes.

Appendix 1: AI contribution statement

The following AI-based tools were used in the completion of this master's thesis.

Tools used: Claude (Anthropic), ChatGPT (OpenAI) and DeepL.

Degree of use:

DeepL was used to produce a working translation of the Interview 3 transcript, which was conducted in German. The translated text was treated as an analytical aid rather than a substitute for the source material, consistent with the approach described in section 3.3. In cases of ambiguity, the original spoken German was given precedence. The use of AI-assisted translation in this context is documented and handled procedurally in accordance with the methodology chapter.

Claude was used in two capacities. First, it assisted with the working translation and initial reading of regulatory source documents not available in official English versions, including Belgian, Italian, French, and Hungarian administrative and legislative instruments. As with the interview translation, translated passages were treated as analytical aids, with classification decisions anchored in the original official wording. Second, Claude was used as a general writing and structuring assistant across several stages of the thesis, including idea generation, outline development, section structuring, drafting support, and language formulation. Sections affected include parts of all six chapters, as well as the reference list and appendices. The analytical judgements, interpretive claims, case classifications, and comparative conclusions presented in the thesis are the authors' own.

ChatGPT was used in a similar general assistance capacity, primarily during earlier stages of the project for brainstorming, structuring arguments, and formulating ideas. It did not contribute to data collection or analysis directly, and no output from ChatGPT was incorporated verbatim into the thesis.

In all cases, AI-generated content was reviewed, critically assessed, and revised by the authors before inclusion. The responsibility for the content, accuracy, interpretations, and conclusions of this thesis rests with the authors.

Appendix 2: Interview Guide

Study: Implementing E-Invoicing in the European Union: An Interpretive Analysis of Regulatory Variation across Member States **Course:** INFN12, Lund University

This guide supports semi-structured expert interviews conducted as a complementary interpretive layer alongside the primary document analysis. Questions are indicative rather than exhaustive; the interviewer may probe, reorder, or omit questions based on the respondent's background and how the conversation develops (Myers & Newman, 2007).

Pre-Interview:

Before the interview begins, the interviewer will introduce the study purpose, confirm voluntary participation and the right to withdraw, obtain consent for recording, explain the anonymisation approach, and confirm the expected duration of approximately 45-60 minutes.

Interview Guide:

To provide a clear overview of how the semi-structured interviews were organised, the table below summarises the interview guide by theme, subtheme, and corresponding questions.

Theme	Subtheme	Interview Questions
Respondent Background	Professional Context	1. Could you briefly describe your current role and how it relates to e-invoicing or digital reporting?
	Organisational Scope	2. What is the size of the organisation you work in or advise, and across how many countries have you been involved in e-invoicing implementation?
Regulatory Influence on the Implementation Process	Process Understanding	3. How would you describe the implementation process of mandatory B2B e-invoicing from your perspective, what does it typically involve?
	Regulatory Influence	4. In your experience, how do regulations influence the way e-invoicing is implemented in organisations, what does regulation actually change or constrain in practice?

Theme	Subtheme	Interview Questions
	Areas Most Shaped by Regulation	5. Which parts of the implementation process are most directly shaped by regulatory requirements, and in what ways?
	Flexibility Under Regulation	6. In your view, how much flexibility do organisations have when implementing mandatory B2B e-invoicing under different regulatory settings?
National Variation and Governance Models	Cross-country Differences	7. When you think about the countries you have worked with, how would you describe the main differences between their e-invoicing or digital reporting requirements?
	Governance Model Differences	8. Are there recurring patterns or important differences you have noticed between more centralised models, where invoices pass through a government platform, and more decentralised or reporting-based models?
	Cross-country Conflicts	9. Have you encountered situations where compliance with one country's requirements created conflicts or complications with requirements in another country within the same enterprise setup?
Architectural and Technical Consequences	ERP and Middleware Architecture	10. How does the choice of ERP or middleware architecture affect how difficult compliance is? Are some architectural approaches better suited to particular governance models?
	Shared vs Country-specific Solutions	11. In your experience, how do enterprises typically organise their approach, do they build country-specific solutions, or try to develop a shared architecture that can accommodate multiple regulatory models?

Theme	Subtheme	Interview Questions
	Practical System Challenges	12. What kinds of challenges have you faced specifically when translating regulatory requirements into practical system implementation?
Future Outlook and ViDA	ViDA Preparation	13. How are the enterprises or clients you work with approaching the ViDA implementation timeline and the changes it will introduce through 2030?
	Risk of Rework and Lock-in	14. Do you see a risk that investments made now in country-specific compliance solutions will require significant rework as the regulatory landscape continues to evolve?
Closing	Core Reflection	15. Based on your experience, what do you think is most important to understand about the relationship between regulation and the implementation of mandatory B2B e-invoicing?
	Additional Insights	16. Is there anything about the implementation challenges or governance differences you have encountered that you feel has not come up in this conversation but would be relevant for a study like this?

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