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JUSTICE(S) IN (CO-)PRODUCTION: A SOCIO-MATERIAL INQUIRY OF DIGITAL INFRASTRUCTURES IN BELGIAN COURTS

Dissertation carried out by

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under the supervision of Christophe Dubois,
to obtain the degree of PhD in Political and Social Sciences

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GENERAL ABSTRACT

This thesis investigates three digital innovations in the Belgian justice system, introduced over the past three decades as part of broader judicial "modernization" programs. Promoted as remedies for long-standing criticisms of inefficiency, opacity, and delays within the judiciary, their trajectories nevertheless prove fragmented and heterogeneous, continually reshaped by local practices and professional strategies. It seeks to understand how these innovations shape — and are shaped by — judicial practices, while also exploring the broader dynamics of "digital change" across contrasting judicial settings. The analysis draws on seven in-depth case studies, conducted around three digital infrastructures — *juriDict* at the Council of State, *RegSol* in the commercial courts, and *MaCH* in the police courts — following an action-centred methodology attentive to the processes of development, design, maintenance, and use. Four analytical perspectives, drawn respectively from Science and Technology Studies and from the sociology of organized action, public action, and professional groups, are mobilized to examine the socio-material practices and socio-technical infrastructures that underpin judicial work.

By situating the digitalization of these jurisdictions within the longer trajectory of judicial reforms, the thesis shows how it both extends and reconfigures earlier organizational and managerial transformations. Through a collective and iterative approach, it offers a situated understanding of the conditions that shape the lifecycle of these infrastructures — from design to everyday use — and highlights their role as vantage points for observing professional, normative and political changes. These transformations gradually sediment through frictions, adaptations, and circumventions. As such, digital infrastructures constitute both sites and actants in their co-production. They reshape how discretion is exercised, what counts as "good legal work," and how authority and power are distributed. What emerges, therefore, is not a singular "digital justice," but multiple and contingent forms of partial digitalization that unfold differently across jurisdictions, reflecting the negotiated and sustained-through-practice nature of judicial digital transformation.

Keywords: Belgian justice system, digital infrastructures, modernization reforms, action-centred approach, case-study research

RÉSUMÉ GÉNÉRAL

Cette thèse analyse trois innovations numériques au sein du système judiciaire belge, introduites au cours des trois dernières décennies dans le cadre de programmes plus larges de « modernisation » de la justice. Présentées comme des réponses aux critiques persistantes d'inefficacité, d'opacité et de lenteur de l'institution judiciaire, leurs trajectoires se révèlent, néanmoins, fragmentées et hétérogènes, sans cesse reconfigurées par les pratiques locales et les stratégies professionnelles. Celle-ci s'attache à comprendre comment ces innovations façonnent — et sont façonnées par — les pratiques judiciaires, tout en explorant les dynamiques plus larges du « changement numérique » au sein de contextes judiciaires contrastés. L'analyse s'appuie sur sept études de cas approfondies, consacrées à trois infrastructures numériques — *juriDict* au Conseil d'État, *RegSol* dans les Tribunaux de commerce, et *MaCH* dans les Tribunaux de police — selon une méthodologie centrée sur l'action, et attentive aux processus de conception, de développement, de maintenance et d'usage. Mobilisant quatre perspectives complémentaires, inspirées respectivement des Science and Technology Studies et de la sociologie de l'action organisée, de l'action publique et des groupes professionnels, la recherche rend compte des pratiques socio-matérielles et des infrastructures socio-techniques sur lesquelles reposent le travail judiciaire.

En inscrivant la numérisation de ces juridictions dans la trajectoire plus longue des réformes judiciaires, cette thèse montre la manière dont elle prolonge et reconfigure les transformations organisationnelles et managériales antérieures. Par une approche collective et itérative, elle propose une compréhension située des conditions façonnant le cycle de vie de ces infrastructures — de la conception à l'usage quotidien — et met en évidence leur rôle d'observatoires privilégiés des transformations professionnelles, normatives et politiques. Ces transformations se sédimentent progressivement, au fil de frictions, d'adaptations et de contournements. Les infrastructures constituent ainsi à la fois des sites et des actants de leur co-production. Elles reconfigurent l'exercice du pouvoir discrétionnaire, les critères du « travail juridique bien fait », et les relations d'autorité et de pouvoir. Ce qui émerge n'est donc pas une « justice numérisée » singulière, mais des formes plurielles et contingentes de numérisation partielle, se déployant différemment selon les juridictions et reflétant le caractère négocié et soutenu par les pratiques de la transformation numérique judiciaire.

Mots-clés : système judiciaire belge, infrastructures numériques, réformes de modernisation, approche centrée sur l'action, recherche par études de cas

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As every social science researcher knows, a thesis rests heavily on access to the field. I am deeply thankful to each court that welcomed me so openly, offering access to hearings, internal documents, and precious time for interviews. To all the participants who generously shared their daily realities with me, often under pressure and amidst uncertainty: thank you.

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Much credit is also due to my family. First, to my parents: your trust in whatever path I choose to follow has always felt truly unfailing. Thank you as well for teaching me the value of perseverance and curiosity — lessons that have carried me through this journey and far beyond. But above all, thank you for showing me what generosity truly means — simply by being the most generous people I know. Your time, your care, and your quiet readiness to support me throughout this thesis have not only sustained me but also shaped the spirit in which I tried to carry out this work. To my sister, Lucie: thank you for respecting the unspoken rule of "no thesis talk", while always being there when I needed to break it. But also, for your remarkable ability to read my mood from a distance and quietly check in when it mattered most. And of course, for heroically diving into the trenches of formatting hell: This manuscript owes its good looks to you. To my brother, Yannick: thank you for constantly challenging the relevance of sociology in today's world — and, in doing so, pushing me to constantly reexamine myself and my place in it. But also, for the many tech tips, whether AI tools, transcription hacks, or translation shortcuts, that made this work a little easier.

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GLOSSARY

ANT	Actor-Network Theory
ICT	Information and Communication Technology
MaCH	Mammoet at Central Hosting
NPM	New Public Management
RegSol	Registre Central de Solvabilité (Central Register of Solvability)
FPS	Federal Public Service
STS	Science and Technology Studies
SOA	Sociology of Organized Action

Preliminary remarks

Quotes from policy and internal documents, legal references, interview transcripts, and field observations have been translated from French and Dutch to English by the author.

This thesis is written in British English.

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INTRODUCTION

For several decades now, public institutions across Europe have faced mounting pressures to modernize. Justice systems are no exception (Borot, 2001; Vigour, 2004). These pressures stem from various sources: rising caseloads, limited financial and human resources, growing demands for transparency, and evolving expectations regarding the accessibility and efficiency of justice (De Munck & Verhoeven, 1997; Ficet, 2012). At the heart of these calls for modernization lies a succession of judicial innovation[1] logics — organizational, managerial, and digital — presented as remedies to inefficiencies, delays, and coordination problems within complex judicial systems (Frade et al., 2020; Mason, 1978; Susskind, 2019). Alongside these broad discourses of modernization, a variety of judicial innovations have emerged, seeking to address the very problems they denounce. Such initiatives vary widely in their origins, objectives, and scope: some developed within a single court, others spanning entire judicial systems; some driven by local experimentation, others by political reform; some oriented toward the delivery of justice, others toward its management; and all involving a diversity of actors, instruments, and tools. Increasingly, this drive for modernization has acquired a strong digital dimension, positioning technology as a key lever for transformation (Aoláin, 2007; Cappellina, 2018). Over the past two decades, the digital transformation of public institutions has thus evolved from a mere technical fix into a social imperative (Cordella & Bonina, 2012). Whereas early initiatives focused primarily on the dematerialization of documents and workflows, more recent reforms in public services aim to bring about deeper structural, cultural, and operational change (Iyamu et al., 2021; O'Leary, 2023).

As these technologies become embedded in daily life, they are gradually permeating sectors that have historically been slower or more cautious about adopting innovations — sectors bound by tradition, strict procedures, and high stakes for public trust (Vigour, 2004). Justice is one such sector, often described as resistant to change. Yet precisely for that reason, it offers a particularly revealing site to study the tensions of digitalization (Fabri, 2009; Dumoulin & Licoppe, 2011). Reliance on interpretive reasoning, procedural consistency, and symbolic authority to uphold public trust means the judiciary prioritizes predictability, stability, and fairness over rapid

[1] Judicial innovation can be understood as the introduction of changes — whether imposed from above or initiated locally — that transform the practices, organizational modes, and/or instruments of justice in a situated manner, often fragile, and oriented toward specific institutional objectives, such as efficiency, speed, accessibility, and legitimacy (Ackermann & Bastard, 1993; Bastard et al., 2016; Bastard & Mouhanna, 2007).

innovation. The judiciary's deliberative processes and reliance on discretionary judgment further underscore its careful approach to integrating new tools, particularly those that may alter its foundational principles of impartiality and independence. In this context, digitalization in the justice sector is often framed as both a promise and a challenge: a promise to modernize the system, making it more efficient, transparent, accessible and cheaper; and a challenge to make it compatible with interpretive reasoning, procedural consistency (Contini & Fabri, 2001; Dubois & Schoenaers, 2019), and the nuanced demands of judicial prudence, deliberation, and justification (Hildebrandt, 2018). These elements, central to the legal process, defy the belief that technology can replace or reduce the inherent complexities in legal reasoning and judgment, underscoring how digital tools and judicial practices are inextricably intertwined — a core concern of this thesis. Whilst governments and legal-tech providers tout the benefits of automation, interoperability, and data centralization, the real-world implementation of digital innovations in judicial settings reveals far more complex, negotiated, and situated transformations (Contini & Reiling, 2022; Dumoulin, 2016). Despite their rapid proliferation across European court systems, these technologies are still often assessed through techno-centric or managerial lenses — emphasizing efficiency metrics, cost-reduction strategies, and service-delivery targets (Hood, 2007; Lascoumes & Le Galès, 2005). For instance, European e-justice initiatives are frequently evaluated in terms of their contribution to reducing case backlogs, accelerating information flows, and lowering administrative costs (European Commission for the Efficiency of Justice (CEPEJ), 2020). Such framings, however, risk obscuring a more fundamental concern: how digital tools reconfigure professional practices, restructure organizational settings, redraw expertise boundaries, and reshape the concrete arrangements through which public action unfolds. And how, in return, these innovations are shaped and adapted by the very environments they transform.

The Belgian justice system provides a particularly relevant and insightful empirical context for exploring these reconfigurations. Historically shaped by its division into different linguistic regions and court levels, it is characterized by a complex and often siloed institutional structure (de Leval & Georges, 2010; Uyttendaele, 2017). Efforts to modernize the system date back to the late 1990s, set into motion by the public shock and loss of confidence following the "Dutroux affair" (Cartuyvels, 1997). That crisis exposed serious systemic dysfunctions and fragmentations, intensifying pressure on the justice sector to improve efficiency and restore public trust. In response, initial modernization efforts began at the turn of the century. More digitally focused

waves of reforms emerged in the mid-2010s. These reforms have displayed a variety of digital tools, but their fragmented implementation is far from straightforward and underscores the very coordination issues they aim to solve. Their roll out involves not only technical challenges, but also institutional, political, organizational, and professional ones (Piraux, 2017; Schiffino et al., 2023).

This thesis explores the situated transformations that emerge through the embedding of digital infrastructures in judicial practice. More specifically, it seeks to answer the following question: How do digital innovations interactively shape — and become shaped by — judicial practices across contrasting Belgian judicial settings? In doing so, it also examines what their infrastructural embedding reveals about the broader dynamics of "digital change" within these settings. To investigate these innovations empirically, the study employs a collective and iterative case-study design and focuses on three specific digital tools deployed over the last twenty years in distinct Belgian jurisdictions: *juriDict*, a case law database used by the Council of State; *RegSol*, a digital platform for insolvency procedures in commercial courts; and *MaCH*, a case management system deployed in police courts and prosecution offices. These tool–jurisdiction duos were chosen for their diversity, each tied to a different reform phase, logic of development, and contextual elements (such as their institutional mandate and the type of litigation they handle). Digital infrastructures are thus approached as both sites and actants of co-production, where reform imaginaries and socio-technical arrangements meet in the ongoing shaping of justice.

Anchored in a pragmatic epistemology, a relational ontology, and an action-centred approach, this thesis attends closely to situated practices and the everyday realities of judicial work in order to follow tools in action, tracing how they are enacted and re-enacted in daily practice (Latour, 2002). Considering this focus, the empirical inquiry concentrates on judicial practitioners rather than on litigants or citizens. This choice reflects the central role of professionals in mediating, adapting, and inscribing digital tools into judicial work, while acknowledging that user perspectives constitute another important but distinct line of inquiry. Both methodology and analysis are thus guided by two initial conceptual perspectives: the socio-technical perspective, grounded in STS (Akrich et al., 2006; Law, 1992), and the organizational perspective, rooted in the SOA (Crozier & Friedberg, 1977). Both emphasize the mutual constitution of tools and practices within situated contexts. Complementing these, a socio-material lens (Orlikowski, 2010; Suchman, 2007)

highlights how digital infrastructures are relational by nature, simultaneously assembling and being assembled by actor-networks and modes of action.

Through iterative empirical engagement with case-studies and abductive dialogue with existing literature in the sociology of justice (Delpeuch et al., 2014; Vigour et al., 2022), two further perspectives emerged: a socio-political one which draws from the sociology of public action and focuses on how infrastructures materialize political rationalities and steering strategies (Halpern et al., 2014; Hood & Margetts, 2007; Lascoumes & Le Galès, 2005; Musselin, 2005); and a professional one, rooted in sociology of professional groups (Abbott, 1988; Demazière & Gadéa, 2009), boundary work (Gieryn, 1983; Langley et al., 2019), and sociology of expertise (Elmholdt & Elmholdt, 2017; Eyal, 2012)**,** which investigates how legal professional groups adapt to and inscribe their work, skills, and strategies into these new tools. Together, these perspectives provide an analytical grid that captures the plurality of changes at stake, enabling a comprehensive understanding of judicial digitalization as a situated, negotiated, and contested process shaped by diverse actors, rationalities, and organizational contexts. In order to enhance empirical visibility, the thesis also adopts a lifecycle framework, following digital tools across four stages — development, design, maintenance, and use. This framework is dynamic and reveals that digital infrastructures are never "finished" products: they are continually renegotiated through decisions, breakdowns, and adaptations. By examining how judicial practitioners and other stakeholders navigate these four steps *in situ*, the lifecycle framework demonstrates that digitalization is not a story of disruption, nor of efficiency gains but a complex, dynamic interplay of legal norms, professional cultures, institutional pressures, political reforms, organizational practices, local uses, and technological design that shapes the everyday reality of Belgian courts. The lifecycle thus helps trace how infrastructures sediment into practice, prompting reconsideration of normative, political, and ethical assumptions about judicial work (Ayoko, 2021).

The thesis makes three main contributions to the sociology of justice and, more broadly, to socio-legal studies of digital innovations in judicial institutions. Firstly, while much of the existing scholarship on the use of digital tools in justice systems has mainly focused on single organizations (Seepma et al., 2021), this thesis adopts a collective and iterative case-study design across three contrasting Belgian contexts — each characterized by distinct organizational practices, cultures, and resource constraints. This cross-jurisdictional approach enables a nuanced examination of how

these contextual factors shape the development, deployment, and everyday functioning of digital tools, moving beyond the single-case focus that dominates the literature. Secondly, it transcends tool-centric or adoption-focused studies by tracing the lifecycle of digital tools. By foregrounding these stages, it demonstrates how digital infrastructures provide a vantage point to analyse organizational, professional, normative, and political transformations, underscoring the negotiated character of judicial digitalization. Thirdly, the thesis situates digitalization within the longer trajectory of judicial innovation scholarship (e.g., Ackermann & Bastard, 1993; Bastard et al., 2016; Bastard & Mouhanna, 2007; Schoenaers, 2015, 2021; Vigour, 2004), showing how it both extends and reconfigures earlier organizational and managerial reforms.

The thesis is structured as follows. This is an article-based thesis designed around four main parts composing a total of eight chapters. Part I lays the definitional, institutional, historical and contextual foundations for the entire thesis. Chapter 1 defines key digital terms, reviews promises and tensions of judicial modernization and introduces infrastructure as the guiding concept. Chapter 2 situates Belgium within this broader trajectory. After an overview of Belgium's complex, multi-layered judicial landscape, it highlights how the Dutroux affair and successive waves of organizational, managerial, and digital reform reshaped the sector. Part II presents the general methodology adopted in this research. As each article describes its own particular methodology, this part addresses the more general methodological choices that were made. Chapter 3 explains how the study's research design was constructed, detailing its pragmatic epistemology and relational ontology, its abductive, collective case-study strategy, and its core conceptual lenses. Chapter 4 translates the design into practice, offering a step-by-step narrative of how the three tool–jurisdiction duos were investigated within the field, as well as the data production methods and analysis. Part III presents three empirical standalone articles (Chapters 5 to 7), each offering an in-depth analysis of one digital tool and its jurisdictional context. Finally, Part IV is devoted to a cross-cutting discussion (Chapter 8) of the insights across the three empirical articles, reframing "digital transformation" as plural, situated digitalization(s) unfolding beneath reform waves, and reflecting on their broader professional, normative and political implications. Finally, the thesis ends with a short conclusion briefly summarising the different stages of this work and its main results, while paving the ways to future research avenues.

PART ONE — CONTEXTUALIZING THE DIGITAL: FROM CONCEPTUAL "CONSTRUCTS" TO INSTITUTIONAL REFORMS

CHAPTER 1 — SITUATING "DIGITAL JUSTICE": CLARIFYING TERMS, DEBATING PROMISES, AND TRACING SITUATED PRACTICES

The emergence of digital innovations in justice systems has given rise to a dense but fragmented body of scholarship, policy initiatives and reform narratives. While digital change shapes how reforms are framed, how innovations are legitimized, and how success or failure is evaluated, the very language used to capture it remains unsettled. This chapter therefore unpacks three terms — *digitization*, *digitalization*, and *digital transformation* —, first by examining how they are defined and mobilized, then by situating them within broader debates about the promises and tensions of digital change, and finally by reframing digital tools such as *juriDict*, *RegSol*, and *MaCH* as infrastructures. In doing so, the chapter shifts the focus from abstract constructs and policy ideals to the situated practices through which "digital justice" takes form, highlighting both the discursive and the material dimensions of digital change.

1. Defining the vocabulary of digital justice

Understanding how digital innovations permeate the justice system requires clarifying the vocabulary that circulates in both academic and policy debates. Three terms in particular — *digitization*, *digitalization*, and *digital transformation* — recur frequently. Although often used interchangeably, each term addresses different processes and outcomes from different disciplinary traditions. The literature reflects significant ambiguity, resulting in conceptual overlap, and little definitional consensus. As Gradillas & Thomas (2025) show, there are no fewer than twenty-six different definitions for digitization and digitalization alone, underscoring the conceptual uncertainty that characterizes this field. Historically, digitization led scholarly discourse until 2018, when digitalization surpassed it in prevalence. Furthermore, digitization remains more common in U.S.-focused information management journals, whereas digitalization predominates in European scholarship and finds broader application across management disciplines. Meanwhile, digital transformation has increasingly been adopted in managerial and political discourse to signal systemic change.

1.1. Digitization: Converting analogue assets into digital artifacts

Digitization refers to the technical processes involved in converting analogue data and artifacts into digital formats. This transformation encompasses three primary activities (Gradillas & Thomas, 2025):

1. **Conversion**: This is the initial step where analogue or physical precursors, such as paper documents or audio recordings, are converted into digital form (Legner et al., 2017). In the context of justice, this involves the scanning of physical legal documents — such as case files and administrative paperwork — into PDF documents, allowing for easier storage, retrieval, and sharing of documents across various judicial departments and among legal professionals.
2. **Representation**: This involves capturing and depicting real-world phenomena in a digital format, such as creating a digital version of physical evidence. For example, digital imaging is used to recreate the exact condition of a car accident in court (Frenzel-Piasentin et al., 2021).
3. **Enhancement**: This process enhances analogue or physical artifacts through digital means, for example, by incorporating data analytics tools to analyse large volumes of case data, thereby adding value and functionality to the original analogue form. Additionally, enhancing security features for sensitive digital documents to prevent unauthorized access and ensure privacy and compliance with legal standards could be another facet of digitization (OECD, 2019).

Overall, digitization is characterized by the digital abstraction of information, reducing the reliance on physical assets for information storage, transmission, and processing. It transforms analogue content into digital artefacts[2] that are supposed to be more versatile and productive, driven by software algorithms capable of interpreting and transforming digital data.

1.1. Digitalization: Socio-technical adoption and use

In the literature, digitalization extends beyond the mere technical conversion of data. It is framed

[2] Digital artifacts are dynamic and layered entities shaped by the interplay of technology, information, and human practice (Gradillas & Thomas, 2025; Yoo et al., 2010).

as a socio-technical transformation driven by the adoption, application, and utilization of digital artifacts by societies, organizations, and individuals (Gradillas & Thomas, 2025). This transformation is described through three progressive stages:

1. **Adoption**: The focus is on the initial uptake of digital tools and systems across sectors (O'Leary, 2023). In Belgium, for example, platforms have been introduced to streamline administrative processes and improve case management, including electronic filing systems, digital databases for legal documents, and secure communication channels for legal professionals (Hubin, 2017). These initiatives are promoted as reducing paper use, speeding up case processing, and increasing transparency of legal proceedings.
2. **Application**: For instance, video-conferencing technologies were mobilized to conduct hearings remotely (Dumoulin & Licoppe, 2011).
3. **Utilization**: This final aspect focuses on the sustained engagement with digital technologies (Frenzel-Piasentin et al., 2021). In this vision, the justice system would progressively utilize digital technologies to foster a more responsive and adaptive environment though ongoing training for legal professionals in digital competencies, regular updates to software and systems, and the development of citizen-facing platforms, such as portals for tracking case status.

According to these narratives, the digitalization of justice represents a significant socio-technical transformation (Legner et al., 2017). A central task of this thesis is to examine how such transformation is anchored in concrete innovations — such as *juriDict*, *RegSol*, and *MaCH* — and to assess whether and how they actually (re)shape practices.

1.2. Digital transformation: Discourse of systematic change

Digital transformation is presented as the most holistic and ambitious stage of digital reform. Unlike digitization (a technical conversion) or digitalization (a process adaptation), digital transformation is framed as a systemic reconfiguration of the justice system as a whole. This transformation is often described as a process that necessitates a concerted effort to integrate technologies meaningfully. It goes beyond the initial adoption of digital tools, affecting deeper structural, cultural, and operational changes (Iyamu et al., 2021; O'Leary, 2023). First, digital transformation can lead to significant reconfiguration of both the organizational and operational

practices. For instance, integrated case management systems are promoted as altering how cases are filed, tracked, and resolved, while connecting different jurisdictions and branches of the justice system into a seamless whole. Second, at the heart of digital transformation is a cultural shift towards a digital-first mentality, where legal professionals are trained and encouraged to treat digital tools as their primary resources. Third, digital transformation could automate routine tasks, such as document verification, scheduling, and notifications. Within this framing, digital transformation represents the cumulative impact of digitization and digitalization on a macro scale (Gradillas & Thomas, 2025), leading not merely to greater efficiency but to a redefinition of how justice is conceptualized, accessed, and delivered (Legner et al., 2017). In Belgium, as elsewhere, policymakers present it as the ultimate goal of digital reforms: not just to modernize courts, but to fundamentally transform the justice system.[3]

1.3. Beyond the spiral model

The relationship between these digital categories is presented as dynamic and cyclical (Gradillas & Thomas, 2025). The starting point of the framework is nondigitized precursors, which are converted into digital artifacts — digital versions of case files, evidence, and other legal documents — through the technical process of digitization. Once digital artifacts become available, digitalization involves their integration into everyday activities, potentially reshaping how the justice system operates. This requires the development of new socio-technical structures and socio-material practices around digitized data, artifacts, and processes (Orlikowski, 2010). The development and adoption of digital technology is believed to be accompanied by negotiations with established practices and structures that result in organizational, institutional, and social changes which is referred to as digital transformation. In this narrative, each loop feeds into the next, while also generating feedback to earlier stages, allowing for continuous evolution as technologies advance and institutional needs change — see Figure 1. This spiral model highlights distinct emphases — technical conversion, process enhancement, and systemic transformation — while presenting them as interconnected stages of increasing depth and complexity (Iyamu et al., 2021). It is an influential way of imagining digital change in justice systems. Yet treating these categories as if they were objective "constructs" risks naturalizing them. It reproduces a

[3] This broader reform discourse is examined in more detail in the next chapter, which traces how digital transformation has been framed as part of successive modernization initiatives in the Belgian justice system.

technician's perspective who presents digital transformation as a linear path and prescribes what should be done and how. From an analytical perspective, these terms are better understood as discursive repertoires: they reveal how different actors imagine, frame, and legitimize digital innovation. This thesis therefore does not adopt the spiral model as an explanatory framework. Digitization, digitalization, and digital transformation each capture particular ways of framing change, but in practice they materialize through concrete digital innovations. These innovations — such as *juriDict*, *RegSol*, and *MaCH* — are the empirical focus of this research. They constitute the sites where the promises associated with digital transformation are translated, negotiated, and sometimes contradicted in everyday judicial practices. Accordingly, this thesis approaches the relationship between digital innovations, actors, and practices as one of mutual shaping and influence (Latour, 2005; Suchman, 2007) in order to explore how socio-technical assemblages take form, produce relational effects, and stabilize particular meanings of what "digital change" in justice is (Jasanoff, 2004; Orlikowski, 2010).

While the vocabulary of "digitalization" and "digital transformation" will occasionally be used to situate the discussion within broader debates, the analysis instead examines how the promises attached to these categories are anchored — and often challenged — in practice through concrete digital innovations. The choice of terminology may vary depending on the analytical focus or empirical setting, yet this does not suggest that alternative terms are absent or irrelevant. Rather, their boundaries are often porous. In many cases, these processes appear intertwined: one may lead into or overlap with another, especially in contexts where digital innovations evolve alongside institutional reforms and local adaptations. In this thesis, the terms are thus employed in a complementary manner, with attention to their intersections and the analytical nuances each brings. The central question is not whether justice is undergoing a "digital transformation", but whether and how specific innovations such as *juriDict*, *RegSol*, and *MaCH* live up to — or diverge from — the systemic ambitions associated with that discourse. Hence, these terms are not treated as a conceptual assumption but as an empirical question. In this way, the analysis shifts the focus from abstract "constructs" to situated innovations.

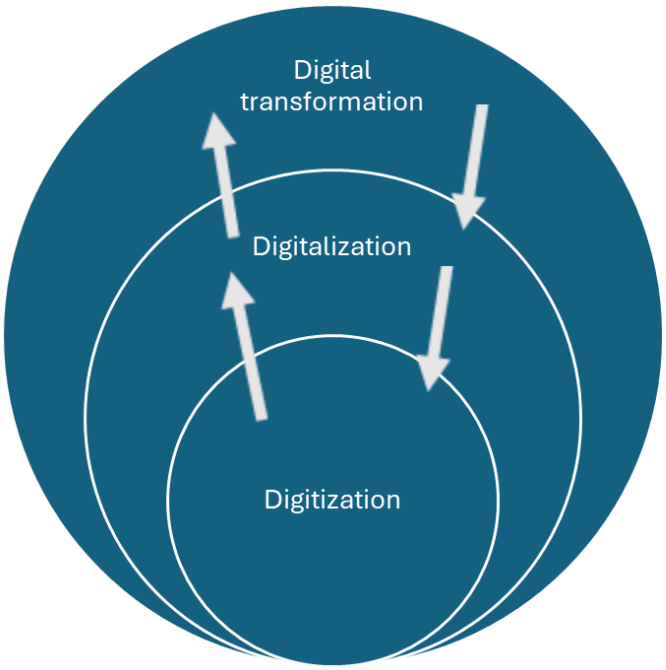

Figure 1. *Conceptual visualization of digital categories*

2. Debating digital justice: Promises, tensions, and situated realities

Having clarified these discursive categories, the following section explores how these are framed, mobilized, and contested within the literature and policy debates. It examines the promises of improved access and efficiency often but also engages with critical and empirical accounts that challenge techno-deterministic ideals and highlight the situated nature of digital practices in legal contexts.

2.1. Constructing the promise

Over the last two decades, digitization, digitalization, and digital transformation have frequently been portrayed as central strategies for governments aiming to modernize justice systems and improve universal access to justice (Salmerón-Manzano, 2021). Underlying this modernizing discourse lies techno-utopian ideals, emphasizing technology's potential to deliver solutions to structural inefficiencies and inequities within judicial systems.

To start, technology is often presented as a solution to reduce the "justice gap" (Menon, 2020), defined as "the difference between the number of people experiencing problems that could benefit from some sort of legal assistance and the number who receive it" (Cannon, 2022, p. 528). This "justice gap" includes three dimensions: being physically separated from the institutions of justice, being without the means to afford the cost of getting there, and having low levels of legal literacy. According to Menon (2020), digital tools have the potential to tackle these three dimensions by eliminating the requirement for physical presence at judicial institutions, lowering associated costs through enhanced competition and reduced operational charges, and improving legal literacy through more accessible legal information and aid resources. Hence, digitalization is seen as a mechanism that could provide people with quick, affordable, and equitable solutions to legal problems.

Another major promise associated with digitalization is the enhancement of efficiency in judicial systems. Digital tools are presented as capable of lightening judges and clerks' workload through the automation of their working process (Mason, 1978); fastening the diffusion of information while increasing its centralization and transparency; saving money via the reduction of printing costs and paper mailing; and facilitating information exchange between the parties involved. Improving productivity in the courts has become of utmost importance as governments seek ways of meeting escalating demands for services with increasingly limited resources. This seems even more important as court performance has been at the centre of global and public debate and is one of the success indicators in developing public policy on access to law and justice (Frade et al., 2020). Courts should be able to respond appropriately to the high social expectancies which have been generated through their capacity to serve as guarantors of citizens' rights and as a factor within the economic balance and stability. Using new technologies in the justice domain and, particularly, in the courts, is believed to display both a response to the need to offer a faster and more efficient management of justice, with fewer wasted means, and an accelerator to assess their always more demanding performance.

Such benefits are widely recognized and internationally endorsed. Institutions explicitly link efficient judicial systems to economic growth and fundamental rights protection, positioning digital transformation as vital for ensuring judicial resilience, reducing delays, increasing legal certainty, and lowering costs. For instance, the European Commission's e-Justice Strategy and

Action Plans (European Commission, 2008, 2019) have aimed to promote the use of ICT in judicial systems across Member States[4] to ensure the functioning of internal market and access to justice. The latter is seen as a prerequisite for the realization and protection of other rights (Aoláin, 2007; Fierens, 2020) and so, must be preserved and evolve with the pace of change, including the digital transformation (European Commission, 2020). In its 2020 report, the European Commission for the Efficiency of Justice (CEPEJ) highlights that deploying ICTs and using them appropriately contribute to the proper functioning of judicial systems, helping to improve the transparency, efficiency, accessibility, and quality of services provided (European Commission for the Efficiency of Justice (CEPEJ), 2020). Similarly, the Consultative Council of European Judges (2011) states that

> "ICTs must be tools or means to improve the administration of justice, to facilitate the access of litigants to the courts, and to reinforce the guarantees offered by Article 6 of the European Convention of Human Rights, namely access to justice, impartiality, independence of the judge, fairness, and reasonable time for proceedings."

Consequently, digitalization is presented as capable of increasing every citizen's confidence in the judicial institution, while designing tomorrow's courts and lawyers (Susskind, 2017). Avoiding digital technologies altogether, Susskind (2019) argues, would risk widening the gap between justice and society.

2.2. From promises to tension

Much of the discourse surrounding emerging legal digital tools frames them as revolutionary breakthroughs, emphasizing unprecedented efficiency, automation, and data-driven decision-making (Pavé, 1989). Rooted in technological determinism (Barley, 1988; Kling, 1991), this perspective portrays technology as operating independently of societal processes (Mauthner & Kazimierczak, 2018). Techno-utopian ideals embedded within these narratives often promote the belief that technologies will increasingly operate autonomously, performing tasks on behalf of humans, whether or not such intervention is desired or solicited (Fisher & Wright, 2006). They also frequently overlook the inherent biases embedded in both the design and deployment of these

[4] For comprehensive information on the EU's e-Justice strategy and action plans, see the European e-Justice Portal.

innovations (Dressel & Farid, 2018). Additionally, they often dismiss recurring "disillusionments" associated with failed automation or digitalization initiatives. Such projects often overstate their efficiency while underestimating their complexities and limitations (Goldfinch, 2007) and frame the current era as one of rupture, transformation, and robotization, emphasizing a narrative of technological inevitability and disruption (Ayoko, 2021).

While these policy narratives underscore the positive promises of digitalization, they also highlight significant concerns about privacy, algorithmic fairness, and reliability of digital tools. The case of COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) illustrates such ethical and practical issues. The COMPAS software was developed in 1999 and used in various U.S. courts to evaluate the likelihood of recidivism and failure to appear in court. A 2017 analysis of data from over 18,000 Florida inmates highlighted racial biases in the algorithm. It was found that COMPAS disproportionately assigned higher recidivism risk scores to African American defendants who did not reoffend — nearly twice as often as for white defendants. Conversely, it underestimated the recidivism risk for white defendants who later reoffended (Dressel & Farid, 2018).

Recognizing these concerns, ethical and governance frameworks have emerged to guide the integration of digital tools within judicial systems. For example, the Council of Europe's European Ethical Charter on the Use of artificial intelligence in Judicial Systems (CEPEJ, 2018) provides recommendations to ensure transparency, accountability, non-discrimination, and respect for fundamental rights in any AI-driven process. Similarly, the European Commission has proposed regulatory frameworks aimed at "trustworthy AI," emphasizing oversight and human-in-the-loop principles. Nonetheless, the real-world effectiveness of these frameworks remains dependent upon ongoing local implementation and critical evaluation (CEPEJ, 2020). Furthermore, these promises and tensions around digitalization do not emerge in isolation. They are historically and institutionally situated, closely intertwined with broader modernization narratives that have reshaped judicial systems, particularly in contexts marked by ongoing reforms and crisis-driven transformations — as we will further explore through the Belgian case in Chapter 2.

2.3. Toward situated realities

The European Commission also acknowledges that the introduction of technology in the courts and in Europe must not compromise the human and symbolic aspects of justice, highlighting the need to balance innovation with fundamental legal principles (CEPEJ, 2020). Critics of techno-deterministic stresses that digitalization is not autonomous or deterministic but emerges through situated interactions and normative visions. Adopting a socio-technical lens reveals that technology is always co-constructed with social practices, organizational contexts, and human agency (Blaha & Hislop, 2022; Mauthner & Kazimierczak, 2018). While the integration of technology significantly influences how law is developed, written, interpreted, shared, and understood, two essential facets of legal practice remain central when considering the limitations of deterministic views of technologies: the inherent ambiguity of legal norms and the challenge of extracting precise meaning. Legal practitioners are tasked not only with mastering an extensive range of legal sources but also with navigating a complex landscape of overlapping norms and problems. To address legal issues effectively, practitioners rely on a combination of logical frameworks, language conventions, and their discretionary judgment to make sense of often ambiguous legal texts (Dubois & Schoenaers, 2019). Furthermore, legal professionals must identify and establish relevant facts — both physical and legal — while considering the unique and contextual circumstances of each case. Legal decision-making is deeply embedded in human language, and algorithms, despite their sophistication, are unlikely to meet the nuanced demands of judicial prudence, deliberation, and justification (Hildebrandt, 2018). These elements, central to the legal process, challenge the overly deterministic narratives of digital solutions.

Over the past two decades, empirical research has further challenged techno-deterministic narratives, highlighting that implementing digital tools in judicial settings is inherently complex, negotiated, and situated (Contini & Reiling, 2022; Dumoulin, 2016). Digital tools indeed transform procedural workflows (Contini & Fabri, 2001), reshape criminal case management (Dumoulin & Licoppe, 2011), redefine courtroom interaction patterns between judges and lawyers (Dumoulin & Licoppe, 2010). These developments not only influence professional dynamics but also raise critical questions about the changing roles of judicial practitioners, like judges, who find themselves acting as political decision-makers. In this context, judicial decisions take on the characteristics of public interventions, reflecting broader shifts in the governance of justice

(Dumoulin, 2016). Digital court tools also impose technological constraints that can reinforce or complement existing legal norms, leading to "double standardization" (Contini & Reiling, 2022). On the one hand, formal legal norms govern how judges, lawyers, and clerks ought to work. On the other hand, technological platforms introduce new obligated passages — structured data fields, automated workflows, or algorithmic recommendations — that implicitly shape (Akrich, 1987; Latour, 1990) user behaviours and interactions. For instance, platform design can embed assumptions about workflow or user roles, effectively constraining or guiding judicial practices. Hence, tools reflect and reinforce specific values, power relations, and modes of regulation (Baudot, 2015). Moreover, the adoption of these digital tools is rarely straightforward; it is shaped by local cultures, global policy frameworks, and the technical features of each platform (Dumoulin & Licoppe, 2010). This convergence of empirical insights highlights that these transformations are neither simple nor uniformly beneficial. They involve intricate interactions between technological constraints, professional practices, local contexts, and global policy imperatives, underscoring the need for nuanced empirical scrutiny.

Ultimately, this thesis conceptualizes digital innovations as socio-technical arrangements, part of an evolutionary progression in practices, rather than a revolutionary upheaval. It advocates for a critical, reflexive engagement with the assumptions underlying digital transformation in justice systems. Hence, appreciating this critical perspective provides a vital backdrop for the empirical analyses presented in subsequent parts.

3. Conceptualizing digital tools as infrastructures

Understanding digital innovation as a deeply embedded, socio-technical process also implies conceptualizing digital tools such as *juriDict*, *RegSol*, and *MaCH* as infrastructures. This recognition highlights how digital tools take shape through evolving uses, appropriations, and situated meanings in legal contexts. Following Bowker & Star (1999), infrastructures are best approached from a relational perspective that emphasizes processes, practices, and actions rather than static objects. This conceptualization resonates directly with the relational ontology and pragmatic epistemology that underpins this thesis. Infrastructures are not stand-alone entities; they emerge through use and practice (Baudot, 2015), shaping and being shaped by the professional and institutional worlds they inhabit. They stabilize shared representations and predefine debates

about justice administration and professional practices. For example, *MaCH* reinforces managerial logics within judicial reform, while *RegSol* supports centralization in insolvency procedures. Positioning these tools as infrastructures foregrounds their relational nature and their capacity to reconfigure professional interactions and institutional routines, ultimately transforming the conditions of the administration of justice. The inherently relational nature of infrastructures means they become "infrastructure" only in relation to organized practices (Jewett & Kling, 1991). In other words, infrastructures emerge in and through practice (Baudot, 2015). For instance, tools like *juriDict*, *RegSol*, and *MaCH* become infrastructures when they embed themselves in judicial workflows and align with professional routines. They also involve new kinds of experts in digital data analysis and communication, operating within institutions that maintain distinct practices, methodologies, and professional expertise. This underscores how an infrastructure functions as a hybrid "data assemblage," encompassing technical systems, human actors, and institutions situated in broader social, political, and economic contexts (Kitchin & Lauriault, 2014). These intertwined socio-technical elements are ultimately articulated through database architectures, platforms, software, and the underlying code, algorithms, ontologies, and standards that enable the infrastructure to function effectively (Bowker & Star, 1999; Williamson, 2016). The notion of "architecture" here captures a conceptual model of standardized digital structures that organize information flows, mirroring and dematerializing physical settings such as buildings, offices, and services.

Because infrastructures are deeply embedded in social and organizational arrangements, they tend to fade into the background, simultaneously invisible and indispensable. One way to render them visible is through failure. As Star (1999) notes, infrastructures often reveal themselves when they break down or disrupt typical workflows. This insight underpins the methodological approach of "infrastructural inversion" (Star & Ruhleder, 2010, p. 118), which involves analysing moments of breakdown to foreground the historical and relational dimensions of infrastructure — thus countering any static or deterministic view of technology. Yet as Denis & Pontille (2022) argue, focusing solely on moments of disruption may obscure the quieter, ongoing work that sustains infrastructural stability. Their perspective on maintenance highlights a different form of visibility, one grounded not in breakdowns but in the routine, and non-heroic actions that preserve the continuity of systems (p.51). Rather than dramatic interventions by experts, maintenance involves ordinary users engaging in situated care, attention, and adaptation. This lens draws attention to the

politics of persistence, to the subtle work of keeping things running in the absence of rupture. This thesis will pay attention to both modes of infrastructural visibility: the disruptions that make infrastructures suddenly salient, and the mundane maintenance practices that ensure their silent durability.

Yet understanding how infrastructures become visible only scratches the surface of their deeper tensions. Beyond questions of visibility, infrastructures embody paradoxes and frictions that echo broader socio-technical transformations. Indeed, infrastructures exhibit an intricate tension: they are at once enabling and constraining, stable and evolving, embedded and emergent. They can drive change while simultaneously resisting it, functioning as both product and process, both internal and external to organizational practices. These tensions closely mirror those discussed in the previous section and invite attention to how infrastructures also reconfigure professional and judicial norms, and forms of legitimacy and power within justice systems. This paradox is explained by processes of structuration, where technological constraints provoke new practices, which in turn generate further adaptations, and calibration (Davies & Mitchell, 1994; Orlikowski, 1992). Over time, infrastructures become the site of a dialectical interplay between structures and actors, shaping and being shaped by the practices they support (Star, 1999) and framing actions and understandings (Nonjon & Marrel, 2015). This recursive dynamic also reflects the broader institutional tensions of digital justice reforms, where the drive for innovation is constantly negotiated through local appropriation and organizational routines. Infrastructures are characterized by their dual pull: on the one hand, they support flexibility and customization adapted to local needs; on the other, they require a degree of standardization to ensure coordination and continuity. In practice, infrastructures must be continually negotiated and adapted by users and designers, illustrating the strain between local variation and global uniformity (Star & Ruhleder, 2010). In the context of this thesis, digital tools such as *juriDict*, *RegSol*, and *MaCH* exemplify the interplay between flexible, locally adapted uses and standardized, globally enforced processes. For instance, *juriDict* centralizes access to legal resources while allowing for differentiated use across actors. *RegSol* functions as a central hub for insolvency management yet must integrate into distinct courts' organizational workflows. Analysing these tools as infrastructures thus highlights the interdependence of their technical architectures and the social worlds they inhabit, offering a nuanced view of how they mediate and structure professional practices, organizational settings and institutional norms in the judiciary. In this way,

infrastructures provide a conceptual bridge between the socio-technical nature of digitalization and the institutional settings in which they unfold, contributing to the situated construction of authority, power relations, normativity, and legitimacy that will surface across the empirical articles.

This chapter has established the conceptual foundations for analyzing the "digital transformation" of justice. By disentangling key terms such as digitization, digitalization, and digital transformation, it has positioned the thesis within ongoing academic and policy debates while also underscoring the conceptual ambiguities that shape them. It has further introduced digital infrastructures as a guiding conceptual lens to critically examine how digital tools are embedded in judicial practices. The next chapter builds on this foundation by mapping the evolution of Belgium's justice system over the past three decades. It examines how modernization efforts have shaped the context in which digitalization initiatives emerge and take root.

CHAPTER 2 — MAPPING BELGIUM'S JUSTICE SYSTEM AND THREE DECADES OF MODERNIZATION

The digitalization of justice takes root in broader modernization discourses that have structured reform in Belgium since the 1990s. From the outset, digital tools such as *juriDict*, *RegSol*, and *MaCH* were introduced as part of this modernization agenda, alongside organizational and managerial reforms. This chapter therefore provides the institutional and historical context for understanding how the Belgian justice system has progressively evolved through what came to be framed as modernization. It begins with an overview of the judicial landscape, outlining the organization, competences, and steering dynamics that characterize Belgian justice within a complex federal state. The second part introduces three innovation logics — organizational, managerial, and digital — that together give substance to modernization. The following sections trace how these logics were mobilized historically: first, by examining the rise of modernization as a political necessity; second, by showing how the Dutroux affair opened a window of opportunity for reform; and third, by analysing how managerial innovations, particularly those associated with NPM, penetrated the justice system. The chapter ends by identifying four distinct waves of reform that, over the past three decades, have combined organizational, managerial, and digital trajectories — progressively embedding digitalization not only as an instrument but also as a driver of judicial transformation.

1. Overview of the Belgian judicial landscape

Belgium is a federal state composed of three Regions and three Communities (Constitution Du 17 Février 1994, 1994, Article 1), each with autonomous normative powers and, to some extent, a say in federal decision-making (Uyttendaele, 2017). Despite this intricate federal design, judicial power remains exclusively a federal competence. Accordingly, Belgium operates under a single, unified judicial system headed by the Court of Cassation, whose sole task is to ensure consistency in the application of the law (Constitution Du 17 Février 1994, 1994, Article 147). However, the reality of judicial administration is more fragmented that this formal unity suggests. Several important responsibilities — such as first-line legal aid, prisoner reintegration, mediation, and certain aspects of sentence enforcement — fall under the jurisdiction of the Communities and

Regions. As a result, any ambitious judicial reform necessarily requires close, and at times difficult, cooperation between the federal government and the federated entities. This institutional configuration is further complicated by Belgium's political tradition of multipartite coalitions. Federal governments are typically composed of at least three or four parties drawn from different linguistic communities — Dutch-speaking, French-speaking, and occasionally German-speaking — with diverse ideological orientations (socialists, liberals, greens, nationalists, Christian democrats). This fragmentation fosters a climate of permanent negotiation, which becomes particularly delicate when addressing sensitive reforms such as those affecting the judiciary. Each initiative must navigate difficult political compromises, as it often touches on fundamental principles such as judicial independence, the distribution of powers, or financial resources. Every judicial reform is thus scrutinized through the lens of community interests, reinforcing the consociational character of Belgian democracy (Vigour, 2018). In this context, federal governments tend to avoid radical reforms and structural changes, preferring incremental, step-by-step adjustments, which slows the pace of implementation.

The organization of the justice system in Belgium must also be understood in light of the constitutional principle of separation of powers (Montesquieu, 1989). The state's three core functions are entrusted to independent bodies: the legislature, the executive and the judiciary. Separation of powers requires that each branch hold distinct authorities that the others cannot exercise — safeguarding the judiciary from directives or interference by the two other branches.

Beyond the federal and political structure, the Belgian justice system distinguishes between judicial and administrative jurisdictions — see Figure 2. Judicial courts — both civil and criminal — settle disputes between private parties or address criminal offences. Administrative courts, on the other hand, review the legality of decisions made by public authorities (municipalities, provinces, Regions, governments, etc.) whenever a citizen challenges an administrative act (Institut d'Études sur la Justice, 2025). Administrative jurisdictions are composed of the Council of State[5] and first-instance administrative courts. The Council of State's core functions are to suspend and annul administrative acts — both individual decisions and regulations — that conflict

[5] While the Council of State belongs formally to the domain of administrative justice rather than the judicial branch in a strict constitutional sense, this thesis uses the terms *judicial* and *judiciary* in a broader, socio-institutional sense. It includes all formalized venues of adjudication — civil, criminal, and administrative — where legal norms are interpreted, disputes are resolved, and professional practices are shaped by digital tools.

with existing legal rules. It also advises on legislative and regulatory matters and serves as the highest administrative Court of Cassation, reviewing appeals against decisions from lower administrative tribunals. The structure of the judicial system itself is a pyramidal and multi-tier system (de Leval & Georges, 2010). At the base are the so-called "exception" courts — district, police, commercial and labour courts — each charged with exclusive or specialized matters. The Court of First Instance handles all civil and criminal cases not assigned elsewhere and, in certain circumstances, additional specific issues. Since September 2014[6], this court has operated through four distinct divisions: Civil; Family & Youth; Criminal; and Sentence Enforcement. The next rung is occupied by the courts of appeal, which review lower-court judgments — though appeals from district courts go to the Court of First Instance and those from labour courts to the Labour Court of Appeal. Serious criminal offences are tried by the Assize Court. Finally, at the apex stands the Court of Cassation, which reviews solely questions of law and guarantees uniform interpretation across the system.

Within the system, a distinction is made between the "seated magistrates" (the judges), who enjoy full independence in their judicial functions, and the "standing magistrates"[7] (the Public Prosecutor's Office), which is hierarchically structured under the Minister of Justice (de Leval & Georges, 2010). Judicial independence means that judges have the unrestrained authority to resolve each dispute on its own merits, applying legal and procedural rules in whatever manner they consider most appropriate. Although the Constitution guarantees prosecutorial independence in individual cases, the Minister of Justice retains authority over criminal policy directives that bind the entire Public Prosecutor's Office (Constitution Du 17 Février 1994, 1994, Article 151).

When discourses of modernization entered the Belgian justice system in the 1990s, they did so within this fragmented and negotiated institutional landscape. Any attempt to frame or pursue reform necessarily had to engage with these structural features.

[6] As of the date, the law creating the Family and Youth Court enters into force (Code Judiciaire, 1967, Article 76)
[7] Because, unlike judges, they rise in court when presenting their oral submissions (Franchimont et al., 2012, p. 46)

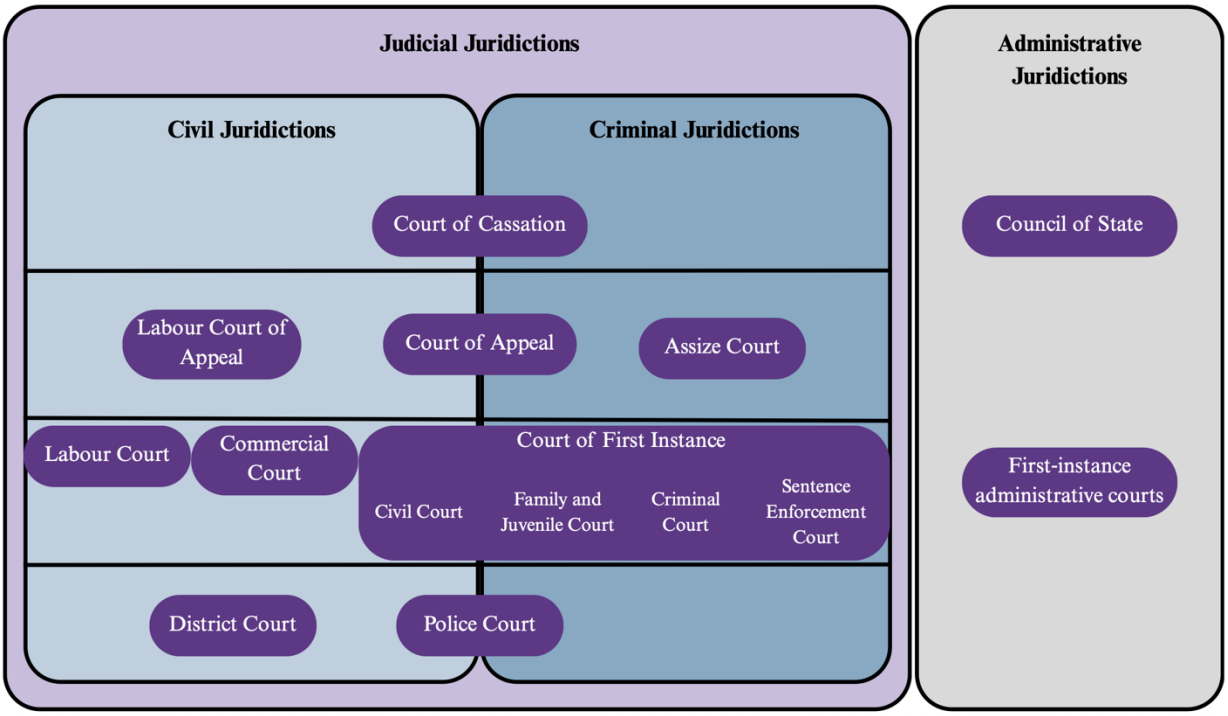

Figure 2. *Overview of jurisdictional levels in the Belgian justice system*

2. Tracing the making of justice modernization in Belgium

In this thesis, "modernization" is primarily treated as a discursive umbrella invoked by policymakers and reformers to legitimize change. It designates a broad and heterogeneous set of initiatives, ranging from procedural reforms to digital instruments. Rather than adopting "modernization" as a self-evident category, three innovation logics — organizational, managerial, and digital — are distinguished, that together give substance to the modernization of Belgian justice. Each logic captures a distinct mechanism through which modernization is pursued. Although they often intersect and overlap, distinguishing them makes it possible to situate the Belgian trajectory within broader debates on justice reform. To situate these logics, it is useful — at least heuristically — to distinguish between the "administration of justice" and "justice administration." The former highlights the symbolic, interpretive, and normative dimensions of judicial work — that is, how legal actors produce meaning, construct legitimacy, and render decisions in the name of justice (Dubois & Schoenaers, 2019). The latter emphasizes the organizational and managerial processes that enable judicial institutions to function on a daily basis, including case management, coordination, and resource allocation (Contini & Mohr, 2007;

Fabri & Langbroek, 2000; Vigour, 2018). While these two dimensions are in practice deeply intertwined and cannot be meaningfully separated, distinguishing them analytically can help clarify how different reform logics intervene.

Organizational innovation refers to reforms that reshape procedures or institutional structures — such as expanding the judge's active role in civil proceedings, strengthening the place of victims in criminal trials, or creating specialized jurisdictions. These initiatives reconfigure justice administration, the way justice is delivered, often altering professional roles and procedural balances (Ackermann & Bastard, 1993). Managerial innovation reflects the rise of NPM into the public sector (Hood, 1991). It shifts attention from adjudication to the administration of justice, introducing instruments such as performance contracts, steering committees, and satisfaction surveys. In Belgium, organizational reforms of the early 1990s were relatively modest in scope and were soon folded into the managerial turn catalysed by the Dutroux affair (1996–1998) — which will be later detailed. This episode marked the most visible push for "modernization" and paved the way for later digital integration. Digital innovation builds on these trajectories by embedding technologies into judicial practice and administration (Garapon & Lassègue, 2018). Digital tools simultaneously affect how justice is organized and managed, and how it is performed, interpreted, and made visible to various actors (Mununguu Lungungu & Falla, 2014; Pollitt & Bouckaert, 2011). In this sense, digital innovations blur the boundary between the administration of justice and justice administration, producing socio-technical infrastructures that embody both organizational and normative transformations. Taken together, these logics highlight that "modernization" cannot be reduced to a single trajectory. Instead, it emerges from the interplay between successive "waves" of organizational, managerial, and digital innovations. In the following sections, we examine how this discourse of modernization has taken shape historically in Belgium and how these different logics have been mobilized in practice.

2.1. The drive for modernization

The term "modernization" has become ubiquitous in policy discourse about reforming governance, the state, and public services. The idea of modernization suggests an alignment with modernity, thus inherently involving a concept of time progression. In a political context it suggests that the current state of an institution is outdated compared to a hypothetical contemporary standard that

epitomizes efficiency as a benchmark of perfection. Modernization represents a persistent effort to bridge the gap between the current reality, and this idealized present. This sparks a discourse on modernization, which emphasizes that the need or urge to improve public administration overshadows the essential, albeit slower, processes of investigation and dialogue required for the successful implementation of reforms (Borot, 2001).

For the past three decades, in a context of political and institutional crisis, the modernization of the Belgian judicial system seems to have become a necessity. This process takes shape through a variety of mutations and reforms[8] (Schoenaers, 2015; Vigour, 2004). Understanding these requires grasping the modernization process. Why and how is the judicial institution being modernized? In Belgium, the onset of modern strategic thinking emerged in the early 1990s. During this period, a mix of factors converged and contributed to bringing the modernization of justice to the forefront of the political agenda. Noteworthy among these were the media exposure of the judiciary's shortcomings and a shifting societal relationship to norms (Munck & Verhoeven, 1997). The convergence of these elements opened a window of opportunity and spurred a renewed willingness to transform the judicial institution (Kingdon, 2003). However, the mere recognition of problems and opportunities is often insufficient to mobilize political action. Judicial reforms frequently originate from the outcomes of unforeseen events, such as crises. Situations of political crisis generally result in justice issues being prioritized on the political agenda (Vigour, 2004). Kingdon (2003) describes this as "problem windows": openings created by the emergence of pressing issues that require solutions. Since the administration of justice is fundamentally a sovereign function, judicial issues frequently escalate into political problems, thus leading to the politicization of crises (Vigour, 2004). It was not until the eruption of a major public scandal — the Dutroux affair — that this window opened and that the conditions were met for significant reform, enabling modernization discourse to translate into concrete action.

2.2. The Dutroux Affair as a catalyst for reform

To fully understand the context in which reforms of the Belgian judiciary were initiated, one must

[8] Reforms are understood as deliberate efforts aimed at improving the system; they are a manifestation of public action. Therefore, reforms are the numerous decisions made to transform the judicial institution (Vauchez & Willemez, 2007). Consequently, reforms are to be distinguished from mutations (Agresti & Gasparini, 2020), which refer to transformations in the judiciary's activities or organizational structure that do not necessarily involve institutional changes, such as the evolution of procedural and jurisprudential methods and shifts in the professional ethos of magistrates (Vigour, 2018).

revisit the "Dutroux affair" (Cartuyvels, 1997), erupting in August 1996 and provoking a major political crisis and an extensive reform of the judicial institution. This case triggered a massive public outcry, culminating in the White March (Kuty, 1999) driven by the heinous nature of the crimes, their extensive media coverage, and the compelling actions of the victims' parents. Their efforts were bolstered by Marc Verwilghen, who chaired the parliamentary inquiry before becoming Minister of Justice and was nicknamed the "White Knight" (Chambre des représentants de Belgique, 1998). His charismatic presence and skilful media engagement (Vigour, 2004) played a pivotal role in amplifying public indignation and shaping the subsequent reforms. While the initial reforms focused on organizational correction (structural and procedural), the political urgency also created fertile ground for more systemic change, including the introduction of managerial logics into the judiciary.

On August 17, 1996, the bodies of two missing girls, who had been raped and murdered (Mélissa Russo and Julie Lejeune), were found. The main suspect, Marc Dutroux, was previously convicted of paedophilia-related crimes. Subsequently, more cases tied to the same suspect involving the abduction and murder of minors came to light. Irregularities in the police and judicial processes led to the establishment of a parliamentary inquiry commission tasked with scrutinizing the investigation of the Dutroux affair. The commission aimed to identify the system's "dysfunctions" and determine accountability. The hearings were broadcast live on television and attracted the attention of millions of Belgians (Schoenaers, 2021). The inquiry particularly pointed out the issues stemming from inter-police conflict and inadequate information sharing with the investigating judge, among others. In September, the King met with the parents of the missing children, and in October, he hosted a roundtable at the Royal Palace where he openly condemned the errors and urged improvements in the justice and police systems (Vigour, 2004). The political crisis triggered by the Dutroux affair compelled Belgian politicians to take decisive and immediate action. Given the urgency and complexity of the situation, these reforms were considered as "ultimate" measures (Dobry, 2009). This was especially apparent during Marc Dutroux's escape in 1998 while being transferred to the courthouse. Despite his recapture a few hours later, the government acted promptly to avert another political crisis, indicating a learning curve from the 1996 crisis. Two institutional tools for managing severe crises were subsequently implemented. Firstly, the immediate resignation of the Ministers of Justice and the Interior, signalling the government's acknowledgement of responsibility, and secondly, an ambitious reform agreement

for police and judiciary was signed by eight democratic parties, representing both opposition and ruling majority. This agreement, nicknamed the Octopus Agreement to reflect the eight signatories, was reached after 72 hours of continuous, closed-door negotiations. The Octopus Agreement reforms notably include the establishment of the High Council of Justice, which is tasked with appointing and evaluating magistrates, the creation of a Federal Prosecutor's Office and of a National School of Judiciary, and the introduction of a seven-year term limit for senior magistrates. This represents an unprecedented crisis mechanism for judicial reform (Vigour, 2004).

However, while these measures were politically strategic and symbolically powerful, they were not necessarily conceived with long-term coherence in mind. Rather, they reflect a logic of compromise, typical of Belgium's federal structure (Vigour, 2018). In such a context, reforms often aim to secure consensus across multiple parties and linguistic communities, even at the cost of judicial efficiency. The High Council of Justice, for example, was intended to depoliticize judicial appointments, yet in practice, its implementation has been shaped by ongoing political bargaining. Appointments remain highly sensitive, and political actors have repeatedly sought to influence them through federal coalition negotiations. Moreover, the High Council of Justice's operation has been hampered by uncertain funding, itself subject to volatile budgetary discussions within successive governments. More broadly, this configuration contributes to a fragmentation of decision-making authority, with overlapping competences and a proliferation of actors that dilutes accountability and weakens the capacity to effectively monitor or implement reforms. In this light, the Octopus Agreement can be read not only as a response to crisis but also as a politically acceptable compromised solution — one that sought institutional stability more than structural transformation. As Dobry (2009) suggests, such reforms serve to defuse political tension but may fall short on the implementation side. While initially driven by the urgency of symbolic repair, these reforms opened the door to longer-term managerial transformations. It is in this context that NPM began to take root in the justice domain, offering a vocabulary and toolkit for institutional modernization.

2.3. NPM as an innovation logic

These moments of crisis and institutional fragility created the political and discursive space for NPM to become a guiding paradigm. This marked a turning point for the judiciary which, facing a deep legitimacy crisis, underwent numerous reforms focused on improving cost-effectiveness,

efficiency, and the quality of outputs. Reforms increasingly combined organizational changes with managerial innovations that targeted the administration of justice itself. On the organizational side, reforms redesigned procedural rules. For instance, by enhancing the judge's active involvement in civil cases — traditionally seen as the affair of the parties in continental countries[9] — and amplifying the victim's role in criminal proceedings (Loi Du 12 Mars 1998 Relative à l'amélioration de La Procédure Pénale Au Stade de l'information et de l'instruction, 1998). At the same time, managerial principles were introduced into the courts, as political authorities sought to "better manage" the functioning of the courts, embedding instruments of performance measurement, accountability, and administrative modernization (Schoenaers, 2021). At the core of these reforms lies the belief that aligning judicial activities with managerial principles — focusing on outcomes and cost management — can better meet public expectations. Both reform trajectories were accompanied by a transformation of the internal administrative apparatus of the judiciary (Pollitt & Bouckaert, 2011; Vigour, 2004), emphasizing a dual approach that targets both operational efficiency and administrative modernization. The Octopus Agreement embodied both reform movements and foreshadowed the later digital trajectory by promoting the use of Information and Communication Technologies (ICT) to deliver justice that is faster, more efficient, transparent, and open to the public. Yet these developments were not unique to Belgium: they reflected a broader transformation of public administrations across Western Europe. To understand the reform of the Belgian justice system over the past three decades, it is therefore necessary to situate it within the rise of NPM.

2.3.1. Emergence and definition

Historically, Western European public administrations were established based on Weberian bureaucratic principles (Bezes, 2007; Weber, 2003), deriving their legitimacy from rational-legal authority, emphasizing the importance of law and impersonal regulations (Friedberg, 1993). However, by the 1980s, this model came under increasing strain due to mounting economic and budgetary constraints. The aftermath of the first oil shock, rising unemployment, and declining tax revenues placed welfare states in a severe budget crisis. As demands for state intervention grew

[9] For instance: (Loi du 16 juillet 2012 modifiant le code civil et le code judiciaire en vue de simplifier les regles qui gouvernent le procès civil, 2012; Loi Du 27 Avril 2007 Modifiant Le Code Judiciaire En Vue de Lutter Contre l'arriéré Judiciaire, 2007; Loi du 27 avril 2007 réformant le divorce, 2007). For the effects of this acceleration of judicial time, see (Bastard et al., 2016)

while resources dwindled, policymakers, academics, and public sector professionals began questioning the sustainability of traditional administrative models. A combination of social critique, financial pressures, and shifting political agendas (Schoenaers, 2021) drove efforts to reform the public sector and paved the way for the introduction of "management" into the public sphere (Pollitt & Bouckaert, 2011). Inspired by managerial practices from the private sector, governments in the United States, Canada, and Great Britain initiated broad programs aimed at rationalizing public resources, influencing European public administrations. By the late 1980s and early 1990s, European states placed reform of public institutions and the rationalization of financial management at the heart of their political programs. NPM emerged as the preferred solution to address the criticisms related to cost inefficiency, slowness, and the opacity of traditional Weberian public organizations (Bezes, 2007). This shift led to key reform projects in Belgium, such the Copernicus Reform (1999–2000) — that will be later explained (Schoenaers, 2021).

NPM represents both an ideology (Hood, 1991) and a series of reforms implemented across various countries over more than two decades, accompanied by specific instruments aimed at enhancing the quality, efficiency, and effectiveness of public services (Cappellina, 2018). NPM aligns closely with what Hood (2007) describes as the "politics of tools" approach — one that emphasizes the strategic selection of instruments based on their perceived adequacy for achieving predefined policy goals. The fundamental premise of NPM is that by adopting management practices from the private sector, public organizations can enhance service quality while simultaneously reducing budgetary burden (Schoenaers, 2021). This strategy focuses on increasing "openness" towards users and improving their satisfaction, with users being designated as "clients" in this context (Cappellina, 2018). This reconfiguration also involves reshaping internal administrative procedures, ensuring that performance indicators and accountability measures become integral to the court's administrative fabric. The shift from the notion of "user" to that of "client" in the public sector is merely the visible part of a broader set of cultural and structural changes rooted in the logic of NPM. The concept of "client" brings with it the idea of evaluating public services through performance indicators (processing times, satisfaction rates, etc.), signalling a move away from a purely procedural or "bureaucratic" mindset (Schoenaers, 2021). Beyond culture, NPM drives structural changes in how public services are organized and managed. For instance, there is the creation of specialized "client" relations structures, such as one-stop shops or mediation services,

tasked with improving direct contact with users. The institutionalization of satisfaction surveys, once rare, has become widespread to better understand users' needs and perceptions, reinforcing the idea of a "client-centred approach" (Pollitt & Bouckaert, 2011).

2.3.2. Instruments and techniques

To achieve these goals, governments, assisted by consultancy firms, have sought inspiration in the private sector to develop a range of new devices. Hence, these instruments primarily rely on the deployment of business-like mechanisms within the public sector (Cappellina, 2018). Termed "new," they are meant to complement and innovatively renew the traditional management toolkit, which previously relied on the scientific organization and division of labour, inspired by Taylorism (Frydman, 2011). Examples include setting performance standards and measurements, organizing work into smaller, interconnected goal-oriented units to improve overall efficiency, and adopting private sector management practices such as work flexibility and performance-based compensation instead of adhering strictly to public service ethics (Hood, 1991). Additionally, they introduced competition or market forces into public procurement to cut costs, privatized specific services like airlines and highway management, and established public-private partnerships (PPPs) (Cappellina, 2018; Schoenaers, 2021). Overall, these examples clearly demonstrate the numerous and relatively diffuse intersections that currently exist between the public sector and various elements traditionally associated with the private sector's operations (Schoenaers, 2014). Indeed, as Schoenaers (2021) highlights, it would be more accurate not to refer to New Public Management in the singular, but rather to discuss New Public Managements in the plural, highlighting the variety of objectives, fields of activity, and the array of techniques and devices that have emerged in this area. Galetto et al. (2013) gather these instruments in four principal processes, which vary in intensity over time, by country and sector: marketization (introducing competition and contractual agreements in the public sector); privatization (aligning public services to private sector standards or outsourcing them to private entities); corporatization (implementing corporate models in public services, breaking down production units, and decentralizing authority); and managerialization (emphasizing efficiency, performance evaluation, and cost control). In theory, these private sector-inspired techniques are intended to be tailored to the public sector environment, resulting in the creation of actionable devices that can be operationalized in the field. This narrative is supposed to culminate in the generation of new operational tools and frameworks,

anchoring the emergence of a new management paradigm for public administrations (Schoenaers, 2021; Vigour, 2017).

Like all management instruments, digital tools are designed to anticipate, organize, command, coordinate, control, and ultimately ensure organizational performance. They are shaped by three imperatives: technological, administrative, and modernizational. Each is influenced by competing rhetorics (Baudot, 2015). These include a *rhetoric of revolution* (e.g., the promise of transformative integration between ICT systems and managerial practices), a *rhetoric of urgency* (e.g., calls to "enter" the digital era), and a *rhetoric of risk* (e.g., fears of inefficiency without digitalization). The instruments are seen as levers for legitimizing political power through technology. Hence, diffusion of digital tools is often portrayed as irreversible, with their adoption framed as essential, even when the conventions and indicators they are based on remain contested (Sacco et al., 2019).

In Belgium, the realms of justice and management have long remained separate compared to other sectors. The combination of legal professional groups (magistrates) who were deeply rooted in their judicial practices and mostly disinterested in managerial ones,[10] kept NPM largely detached from the judiciary (Delvaux & Schoenaers, 2009; Pichault & Schoenaers, 2012; Schoenaers, 2014). However, the Dutroux affair has hasten their adoption by creating a window of opportunity (Vigour, 2004). Public backlash against the judiciary was perceived as a call for greater efficiency and accountability (Ficet, 2012). In the aftermath, reforms simultaneously restructured judicial procedures (organizational logic) and transformed court administration (managerial logic), with digital tools increasingly mobilized to enforce managerial principles and reconfigure internal governance (Pollitt & Bouckaert, 2011; Vigour, 2004). The Dutroux affair thus marked both a symbolic rupture and an operational turning point: organizational and managerial innovation logics — previously peripheral — penetrated the judicial apparatus and, from then on, successive waves of reform progressively embedded them into both the administration of justice and justice administration, while laying the groundwork for a later digital trajectory.

[10] Professionals appear to be in their "ivory tower," very reclusive and silent (Vigour, 2004).

3. From means to ends: Charting four waves of reforms through shifting perspectives on digitalization

We can identify four successive waves of reforms within the Belgian judicial system. Each wave has been closely tied to objectives of reducing public expenditure and enhancing institutional performance, and these remain the guiding principles of ongoing justice modernization efforts. While initially focused on organizational innovations — procedural streamlining and internal reorganization —, these reforms have increasingly relied on digital technologies to support their implementation. In this context, digitalization appears as a convergence point for organizational and managerial logics: it introduces new modes of communication between actors in the judicial process (reflecting the procedural dimension of the organizational aspect), while also promising greater efficiency and cost reduction (managerial aspect). Across these reform phases, the transformation of internal administrative practices accompanied technological changes — a dual evolution that reflects the progressive integration of digital tools into the administrative core of the judiciary (Lascoumes & Le Gales, 2007; Pollitt & Bouckaert, 2011). Initially framed as instruments for supporting efficiency within a NPM logic — especially between 2000 and 2014 (Schoenaers, 2021) — digital tools have, over the past decade, shifted from a supporting role to a central one. Successive Ministers of Justice have increasingly presented digital transformation as the cornerstone of a modern, efficient, and accessible justice system. This paradigm shift highlights the evolving understanding of technology's role in redefining judicial processes and delivering justice: from means of support to an end in itself.

3.1. The revolution: Centralized management and global digitalization efforts (1999-2007)

At the dawn of the 2000s, NPM gained considerable momentum with the implementation of the "Copernicus Plan," aimed at modernizing the federal administration during the Verhofstadt I Government (1999-2003). The name of the plan aptly reflected its goal: to revolutionize the functioning of public authorities and, more broadly, the state's relationship with society (Ficet, 2012). It served as a strategy to restore credibility to a government that had been criticized for its inefficiency and politicization. The reform focused on four main areas: establishing a new

organizational structure, fostering a new management culture, adopting a modern approach to human resource management, and introducing new work methods (Service public fédéral Personnel et Organisation, 2004). The focus was on the managerialization process (Bezes, 2012; Vigour, 2017), using, among other things, managerial and computer tools (Dubois et al., 2019): comprehensive quality management in the public prosecutor's offices, defining roles for chief officers, performance evaluations, and development of workload measurement tools (Piraux, 2017). However, the reception of this managerial turn has varied across regions. In the judicial field, resistance to management tools has historically been stronger in Wallonia than in Flanders. At the beginning of the 2000s, nearly 80% of Dutch-speaking magistrates completed workload reporting forms, compared to less than half of their French-speaking counterparts (Delvaux & Schoenaers, 2009).

The Copernicus Plan, to a much greater extent than the Octopus program, aimed to implement corporate practices within the public sector. This approach is particularly noticeable in how high-ranking officials have been managed: within just a few years, all senior ministry officials (now called FPS), who were traditionally appointed based on their political ties, have been replaced using modern human resource management techniques (including role-playing, assessment centres, and job descriptions), all overseen by expert consulting firms (Ficet, 2012). Additionally, the Copernicus Plan laid the foundation for the development of electronic administration, aiming to boost the efficiency of data exchange across the Federal Administration through technological modernization.

Also, at the start of the 2000s, various European directives prompted member states to leverage new technologies to enhance their interactions with the judiciary (Committee of Ministers, 2001). This mainly included the adoption of electronic procedures, digitally tracking case progress, and receiving judicial decisions via electronic means (Hubin, 2017). Belgium needed to first standardize its judicial computer systems to improve efficiency. By 2001, the judiciary was dealing with the complexity of fourteen different software applications (Mougenot, 2017), complicating the seamless transfer of data. In response, the Verhofstadt I government initiated a huge digitalization project — called Phenix — in 2001, aiming to create a unified, overarching application that could handle all proceedings and case files across all judicial levels, thus streamlining court operations (Colson et al., 2007). This all-in-one application was intended to

save both time and money by eliminating the need for staff to acquaint themselves with new tools when moving between jurisdictions (Wynsdau & Jongen, 2015). The project, worth 22 million euros, was outsourced to a private provider, the ICT consortium AX'OP,[11] a newcomer to the judicial sector, chosen without the involvement or consultation of legal professionals. Nevertheless, the *Phenix* initiative was ultimately declared unsuccessful by Laurette Onkelinx (2003 - 2007), the Justice Minister in 2007 (Hubin, 2017).

Multiple factors contributed to the project's downfall:

1. The lack of work quality provided by the ICT firm AX'OP [12], which was inexperienced with the judicial sector[13].
2. A lack of coordination among judicial entities and the absence of a hierarchical structure overseeing them (Bielen & Marneffe, 2016).
3. Resistance from legal professionals towards the project (Poullet, 2009).
4. The inadequacy of the change management method used for such an ambitious, comprehensive project (Wynsdau & Jongen, 2015).

For many judges, clerks, and lawyers, this failure was perceived as a "trauma," as significant investments of time, money, and effort had been invested in the project to no avail (Buyle & van den Branden, 2017).

In Parallel, the *MaCH* tool was developed and then launched in 2007. *MaCH* is a case management system designed to centralize on a single server the data of district courts, police courts and police prosecutors' offices (Service public federal Justice, 2019). Since 2015, it has also been extended to certain criminal courts and criminal prosecutors' offices, labour auditor's office, and the Federal Prosecutor's Office. Like the Phenix initiative, this plan also encountered substantial implementation challenges. *MaCH* constitutes one of the three digital tools examined in this thesis. It embodies how the first phase of reforms both influenced and was influenced by the

[11] Formerly Unisys

[12] "Given the serious failures observed in the execution of the contract, the firm AX'OP, after multiple formal notices, was ultimately sued by the Belgian state on April 16, 2007, seeking compensation of precisely €27,998,825. This amount was intended to reimburse the state for payments already made for poorly executed work, the search for alternative solutions to mitigate delays, and the unnecessary mobilization of public sector personnel." (Chambre des représentants de Belgique, 2015)

[13] Response from Mr. Van Quickenborne to the request for clarification from Ms. Nyssens to the Deputy Prime Minister and Minister of Justice on "the Phoenix project" (Sénat de Belgique, 2007).

implementation of new technologies. Here, digital tools served as key techniques to implement NPM-driven changes, aiming to reduce costs and improve performance while transforming internal administrative practices. By situating *MaCH* within this specific reform context, this thesis aims to illustrate how managerial imperatives guided its design and deployment, and how its subsequent use reflected and reinforced those broader organizational and policy objectives. Through this lens, *MaCH* becomes a key point of inquiry in understanding the reciprocal relationship between judicial modernization efforts and the digital tools that emerge in their wake.

3.2. A localized, modular and cooperative political strategy (2008-2014)

The year 2009 can be seen as a pivotal moment for Belgian justice. At that time, Justice Minister Stefaan De Clerck (2008 – 2011) authored a guiding document entitled "The Judicial Landscape: Towards a New Architecture of Justice," (De Clerck, 2010) which detailed the core principles for a significant reform of the justice system. To fully understand this initiative, it is essential to trace developments back a few years. Starting in 2005, a series of complex initiatives aimed at reshaping judicial structures were launched. These efforts sought to eliminate the judicial system's fragmentation, resulting from an increase in the number of actors (Piraux, 2017). The Themis Plan, for instance, was designed to modify the Copernicus reform to reorganize these structures (Vigour, 2008). Despite initial support, it was ultimately discarded in 2007 after the federal elections (Ficet, 2012). Subsequently, under the Di Rupo administration (2011-2014), Justice Minister Annemie Turtelboom (2011-2014) was tasked with driving the long-awaited reform. This resulted in the enactment of two laws. The first law implemented two crucial measures (Loi Du 1 Décembre 2013 Portant Réforme Des Arrondissements Judiciaires et Modifiant Le Code Judiciaire En Vue de Renforcer La Mobilité Des Membres de l'ordre Judiciaire, 2013). It introduced a new territorial distribution of justice, now comprising twelve judicial districts instead of the previous twenty-seven. Belgian federalism further complicated this reform, as it had to take into account issues related to linguistic borders and regional competences in territorial management, thereby creating resistance that delayed the process (Vigour, 2018). It required several years of intense negotiation as community tensions — particularly between Flemish and Francophone actors — amplified the political sensitivity of the decisions involved. Furthermore, it increased the mobility of magistrates and judicial staff. The second law introduced an autonomous management system for local judicial entities (Loi Du 18 Février 2014 Relative à l'introduction d'une Gestion Autonome Pour

l'organisation Judiciaire, 2014). This legislation aimed to decentralize and transfer control over budget and personnel management from the judiciary to the local level, thereby fostering a modern, accessible, and efficient justice system (Munungu Lungungu & Falla, 2014). Each court is now overseen by a management committee — legally defined in composition (Code Judiciaire, 1967, Article 185/2) — that assists the chief judicial officer[14] with operational matters while respecting judicial independence. It is responsible for allocating resources based on management plans developed by local judicial entities (Piraux, 2017; Schoenaers, 2021) and for setting up management agreements between these entities and the two new bodies that were nationally established, namely the College of Courts and Tribunals and the College of the Public Prosecutor's Office (Service public federal Justice, 2014a). These latter manage judicial resources under three-year performance contracts with the Ministry of Justice, which set clear operational targets (Code Judiciaire, 1967, Article 185/4).[15]

The aforementioned law, intended to promote autonomous management, received mixed reactions: it caused significant dismay within the French-speaking legal community, yet it was met with optimism by Jean-Louis Desmecht, President of the College of Courts and Tribunals on the Dutch-speaking side. At the 2016 judicial year opening, Desmecht highlighted that for the first time starting in 2019, magistrates will be able to decide for themselves how to allocate their operational budgets and personnel and determine their ICT strategies (Bové, 2016; Piraux, 2017). This shift marks a transition from a centralized and hierarchical "government" of justice to a more "horizontal governance" model, in which authority is more widely distributed and grassroots actors possess enhanced capacity for action. This dual movement of delegation and empowerment is characteristic of the NPM doctrine (Pollitt & Bouckaert, 2011), which supports it by two main arguments. The first posits that local managers' proximity to operations and intimate knowledge of their organizations uniquely qualify them to optimally distribute resources within their jurisdictions. The second, a psychological argument, posits that the move towards contract-based governance makes magistrates more cost-aware and aligned with ministerially negotiated

[14] In Belgium, the following office-holders are regarded as 'chiefs of corps': "the Presidents of the Court of First Instance, the Labour Court and the Commercial Court, the Presidents of the District Court and of the judges at the Police Court, the King's Prosecutor and the Labour Auditor, the First President of the Court of Appeal and of the Labour Court, the Attorney General at the Court of Appeal and at the Labour Court, the Federal Prosecutor, the First President of the Court of Cassation and the Attorney General at the Court of Cassation." (Code Judiciaire, 1967, Article 58bis).

[15] It should be noted, however, that the law makes special provision for the Court of Cassation and the Public Prosecutor's Office at the Court of Cassation, whose management committees will negotiate their funding directly with the political authorities.

objectives. It is also subtly expected that budget management responsibilities will motivate judges to help control the soaring costs of justice. Additionally, in the judiciary's context, an argument can be made for the complementarity between judicial independence and managerial autonomy. A potential oversight of this approach is treating the reform primarily as a managerial challenge when it fundamentally influences the balance of powers and is intrinsically tied to linguistic issues — making it a deeply political matter (Ficet, 2010).

This shift towards local actors' empowerment, who manage increasingly scarce resources, has intensified the trend towards managerialization (Schiffino et al., 2023) and builds upon two other processes identified by Galetto et al. (2013): marketization — fostering competition and contractualization in the public sector — and corporatization — promoting localism. The shift toward modular approaches underscored the need for flexible technological solutions that could be integrated into diverse local administrative contexts. Following the notable failure of the Phenix project, which in 2000 sought a digital "big bang" overhaul of the entire justice system, the idea of a single, giant application was discarded. Instead, a progressive system and a modular, cooperative political strategy was adopted (Dubois et al., 2019). Learning from past failures, the Service Public Justice Federal (2014b) decided to progress by developing specific modules independently, each one being designed to tackle particular issues (e.g., digital files, electronic signatures, digital communication, file access). This method was meant to offer the advantage of phased implementation, ensuring that the delay or failure of one initiative does not jeopardize the entire ongoing digitalization process (Mougenot, 2015). This period can be summarized in two significant developments. Firstly, it witnessed the rise of locally crafted digital tools within various judicial offices, often spearheaded by self-taught magistrates or clerks (Wynsdau & Jongen, 2015). Among these, *juriDict*, developed within the Council of State, exemplifies how digitalization initiatives emerged at a local level in response to specific institutional needs. Launched in 2007, *juriDict* was designed to facilitate access to the Council of State's jurisprudential databases, allowing users to navigate and search case law efficiently. Built on internal expertise without reliance on external private providers, this open-access tool has become essential for administrative law, demonstrating how judicial actors took charge of digitalization efforts within their own institution. Given its influence in reshaping access to administrative case law, *juriDict* is one of the tools analysed in this thesis, serving as a case study to examine the situated transformations that digital innovations generate within the justice system. Secondly, in 2014, FPS

Justice initiated approximately a hundred smaller IT projects (Service public federal Justice, 2014b). The Justice ICT department developed a series of modular solutions, each designed independently, such as the *JustX* database[16]. Together, these developments illustrate a shift towards empowering judicial actors to create and refine their own digital tools while ensuring interoperability within a broader modernization framework.

3.3. Market-driven and outsourcing strategy (2015-2020)

In 2015, Minister Geens (2014-2020) launched his Justice Plan, ambitiously subtitled "Greater Efficiency for Better Justice," which he described as comprising three major leaps. The first leap focused on ensuring the judicial system continued to function smoothly while undergoing further reform. It emphasized cost control and increased reliance on the market, with management control implemented through comprehensive purchasing and equipment management policies, and outsourcing of maintenance for infrastructure, equipment, and buildings, extending the already-existing public-private partnerships. The second leap targeted the overhaul of critical legislation, including the civil code, the criminal code, and the code of criminal instruction. The third leap aimed to reform the legal professions, encompassing lawyers, bailiffs, and notaries. The plan also suggested delegating sovereign functions to other actors of the legal world or privatizing them, promoting alternative dispute resolution methods to lessen judicial proceedings, and transferring competencies to the Communities (Vigour, 2017). The Justice Plan was implemented through a series of laws, collectively referred to as the "Pot-Pourris laws", which intensified the pace and scope of the reforms[17]. These measures aimed to adapt the judicial institution to meet the demands of the modern world, which called for speed, excellence, and cost-efficiency (Piraux, 2017).

Pleased with the modular IT development by his predecessors, Minister Geens proudly referred to 2015 a as "the year that marked the transition to electronic communication in the justice sector" (Geens, 2017). This shift was also recognized by the European Commission in its "2018 EU Justice Scoreboard" (2018) which noted a renewed focus on electronic procedures. This positive trend

[16] *JustX* is a platform centralizing information exchange within the Belgian justice system, aiming to interconnect existing systems through a unique case number and a common data model.

[17] In Belgium, the so-called *"*Pot-pourri*"* laws (I to V, adopted between 2015 and 2019 under the initiative of Minister of Justice Koen Geens) refer to a series of legislative acts that bundled together a wide range of judicial reforms. These measures spanned civil and criminal procedure, the organization of the judiciary, as well as the digitization of certain communication channels and the streamlining of procedural steps. Introduced as a core component of the Justice Plan, their declared aim was to "profoundly modernize" the Belgian justice system by making it more efficient, flexible, and digital.

supported the Justice Plan's emphasis on modernizing the judiciary through enhanced digital solutions. Despite the setbacks of early 2000s ICT initiatives, the "Pot-Pourris laws" reignited the modernization efforts. Key advancements included the transition to electronic communication within the judiciary and with external actors, such as citizens, using systems like *e-Box*[18] and *eDeposit*[19] (Loi Du 19 Octobre 2015 Modifiant Le Droit de La Procédure Civile et Portant Des Dispositions Diverses En Matière de Justice., 2015), the implementation of electronic service by court officers, like *e-Notification* (Loi Du 4 Mai 2016 Relative à l'internement et à Diverses Dispositions En Matière de Justice, 2016), and the adoption of videoconferencing for specific legal processes (Loi Du 6 Juillet 2017 Portant Simplification, Harmonisation, Informatisation et Modernisation de Dispositions de Droit Civil et de Procédure Civile Ainsi Que Du Notariat, et Portant Diverses Mesures En Matière de Justice, 2017). The use of videoconferencing was also expanded during the Covid-19 public health crisis for conducting hearings and internal meeting (Schiffino et al., 2023).

To realize these commitments and successfully advance this broad initiative, the Justice Plan explicitly called for the "indispensable" cooperation of legal professionals in identifying problems, as well as in the design, development, and management of targeted ICT solutions (Geens, 2017). Building on this plan, in June 2016, the minister formalized a cooperation agreement with the professional associations of bailiffs, lawyers, and notaries (Service public federal Justice, 2016a). This agreement assigned a central role to these professional bodies in the creation of digital tools.

> "Digitalization is a crucial lever for modernizing Justice. In addition to significant legislative adjustments and technical developments, it also requires a substantial shift in cultural attitudes and behaviours. Since transitioning to a digitally supported justice system is only feasible if all partners progress together, each contributing a part of the effort and ensuring the overall coherence, it is essential to formalize this collaboration in a protocol and establish a number of fundamental agreements." (p.1)

[18] Designed to facilitate secure electronic exchanges between judicial institutions, legal professionals, and citizens, the e-Box enables users to receive official documents, notifications, and updates from judicial authorities digitally, reducing reliance on paper-based communication (Service public federal Justice, 2016b).

[19] *e-Deposit* is an electronic platform provided by the Belgian FPS Justice, enabling citizens, companies, and lawyers to submit legal documents—such as preliminary procedural documents (petitions), case files, conclusions, and cover letters—to courts digitally (Service public federal Justice, n.d.).

Since their inception, bailiffs have implemented a central registry for the recovery of undisputed professional debt (Loi Du 19 Octobre 2015 Modifiant Le Droit de La Procédure Civile et Portant Des Dispositions Diverses En Matière de Justice., 2015); notaries have set up a database for notarial acts along with the *Biddit* platform (Wuidar & Flandrin, 2022); while lawyers have significantly contributed to the design and development of a platform that allows them to connect to various digital justice services (*DPA-deposit*[20]), the central registry of solvency (*RegSol*), and the application for managing collective debt settlements (*JustRestart*[21]) (Gerrienne, 2023; Pelssers & Dubois, 2022). The technical development of these digital tools has been outsourced to private companies, illustrating the privatization process identified by Galleto et al. (2013). This form of privatization of justice caused and is still causing tension among judges, magistrates, and lawyers, who are concerned about the State delegating the management of sensitive data as a cost-saving measure. The College of Courts and Tribunals has affirmed its commitment to managing all applications internally within the justice system, considering this approach absolutely essential (Boileau, 2024).

RegSol is the third digital tool examined in this thesis. It is a platform designed to streamline insolvency procedures by centralizing data and facilitating efficient information exchange among stakeholders. Its development is emblematic of the broader movement that enrols legal professionals as frontline digital entrepreneurs, with Bar Associations actively taking charge of its design, financing, and management. *RegSol*'s financing model is structured so that the system effectively costs nothing to the bar; in practice, it is pre-financed by the Bar Associations and its operating costs are covered by fees collected from creditors (for example, around nine euros per filing and six euros per document), which not only balance the investment but also generate returns (Avocats.be, 2018a). While the system undeniably functions on an operational level, its funding model and the implications it carries in terms of the privatization of justice are raising concerns — including among lawyers (Boileau, 2024).

Extending the push toward digitalization, Minister Geens in a document titled "Court of the Future", proposed a vision for a modernized justice system heavily reliant on digital technologies

[20] *DPA-Deposit* is an application of the Digital Platform for Attorneys (DPA) that allows Belgian lawyers to electronically submit, manage, and download legal documents accessible online on https://dp-a.be/fr

[21] J*ustRestart* is the Central Register for Collective Debt Settlement, the computerized database in which cases related to debt mediation are stored and maintained. For more information See : Loi du 5 juillet 1998 relative au reglement collectif de dettes et a la possibilite de vente de gré à gré des biens immeubles saisis, 1998)

(Geens, 2017). However, this vision was met with scepticism by the judicial community, who criticized it as overly ambitious given the lack of existing resources. Concerns were also raised about the increased workload and the need to fulfil the current vacancy first. Furthermore, the lack of progress in achieving management autonomy for judicial institutions and the public prosecutor's office, as required by law, was also highlighted.

3.4. Holistic digital transformation ambitions (2020-Feb 2025)

In November 2020, Justice Minister Vincent Van Quickenborne (2020-2023) outlined his initiatives for the justice system. The goals echoed those of the "Court of the Future" report: a faster, more humane, and stricter justice system. This vision was expanded upon in the Recovery and Resilience Plan dated April 30, 2021, which dedicated a substantial section to "digitalization." As evident, the instrumentation of this report incorporated extensive use of new technologies for the dematerialization of procedures and enhanced communication with parties (Cappellina, 2018). An investment of 85 million euros was earmarked for the justice system's digital transformation initiative (Team Justice, 2021). The plan justified this expenditure by highlighting various shortcomings within Belgium's judicial system. For example, it pointed out that the justice operations were still predominantly paper-based, requiring considerable administrative support to handle file logistics, produce transcripts, and manually document every process. Such dependence on paper impeded automation, prevented the simultaneous consultation of case files, and led to the redundant upkeep of both paper and digital records, thus creating widespread inefficiencies. Belgium's justice system, therefore, was not well-prepared for the 2019-2023 EU e-Justice Action Plan's recommendation (European Commission, 2019), which promoted a "digital by default" philosophy. This Plan aimed to weave digital technologies into justice services, making them more accessible to all European citizens, ensuring compatibility between the judicial systems of member states, and enhancing the security and privacy of data in digital judicial proceedings.

Minister Vincent Van Quickenborne was committed to meeting these goals and bringing Belgium into the digital age. This commitment was further supported by a subsequent European Union plan: The Recovery and Resilience Facility (RRF).[22] It was a crucial financial mechanism set up by the

[22] For more information about the Recovery and Resilience Facility, see the website https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility_en (last accessed on November 11, 2025)

European Union as part of the NextGenerationEU initiative, which aimed to help EU countries recover from the economic and social impacts of the COVID-19 pandemic. The RRF had an impressive budget of €723.8 billion available in loans and grants to support member states in implementing necessary reforms and investments to bolster their economies and societies. This facility had two main objectives: promoting Europe's green and digital transitions. Belgium's digital transformation within the justice sector was significantly supported by this RRF[23].

Under Minister Van Quickenborne's leadership, the justice system's digital transformation was framed through an ambitious four-step roadmap, but in practice its operationalization has been partial. The initial step focused on updating technological equipment. By 2021, every magistrate and clerk were provided with a new computer, and by 2022, they also gained access to Office 365. The next step was the creation of the digital case management system (see Figure 3). The approach involved building separate "building blocks," each representing different applications designed for specific functions (see Figure 4). Though developed separately, these applications are part of a larger, strategic plan designed to ensure seamless integration among them. Examples include *Just-View*, which enables magistrates to electronically access case files; *Just-Sign*, which allows for the electronic signing of judgments; and *JustNew*, intended to become the overarching case management system for all judicial bodies[24]. The overarching objective was to establish a completely digitized workflow linking the police, prosecutorial offices, courts, and citizens through a series of interconnected modules. Some of these applications are already operational — but not always available — others are in testing phases, and some remain in development or are at a standstill. Most notably, the *JustSign* project, was abandoned under Minister Paul Van Tigchelt's leadership (2023-Feb 2025) after repeated failures and unmet expectations. He acknowledged the limits of the roadmap and sought alternative solutions through other government services (The Brussels Times, 2025).

The third step of the digital transformation plan focused on databases (Loi du 16 octobre 2022 visant la création du registre central pour les décisions de l'ordre judiciaire et relative à la publication des jugements et modifiant la procédure d'assises relative à la récusation des jurés,

[23] For more information about the Belgium's plan, see the website : https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/belgiums-recovery-and-resilience-plan_en (last accessed on March 4, 2025)

[24] See Figure 3 for a visual representation of the case management system connected by the building blocks

2022). A key element here was the *Central Registry for Judicial Decisions*. This registry aimed to provide the public with free access to anonymized judicial decisions. Access to full decisions is reserved for judicial personnel, as well as for the parties involved in a case, their lawyers, or other legal representatives. Yet the system remained non-functional and inaccessible to practitioners as of April 2024 due to technical issues (persistent delays), organizational shortcomings (poor management; inadequate analysis of professionals' needs), legal obstacles (appeals against the law), and political difficulties (dysfunctional coordination structures; a dispute over the awarding of the public contract) (Gillard, 2025). Minister Van Tigchelt himself publicly acknowledged these shortcomings in January 2025 and admitted that the digital transformation agenda could not be delivered as initially announced (The Brussels Times, 2025).

The fourth step involved the *Just-On-Web* portal, launched in 2021 and continually evolving, which enables citizens to interact with the justice system through a centralized channel. The goal was to integrate *Just-On-Web* with other building blocks like *JustNew*. Concurrently, the Minister Van Quickenborne planed to further digitize the prison system with initiatives such as *JustPrison* and *JustfromCell*, alongside updates to the application managing the Belgian Official Gazette. This fourth phase aspired to epitomize the dual process of modernization: the upgrading of technical tools and the reengineering of internal administrative practices in view of a fully digital justice system. As outlined in Chapter 1, it reflects an intended shift from digitalization toward digital transformation, where technology was envisioned as a catalyst for systemic and institutional reconfiguration.

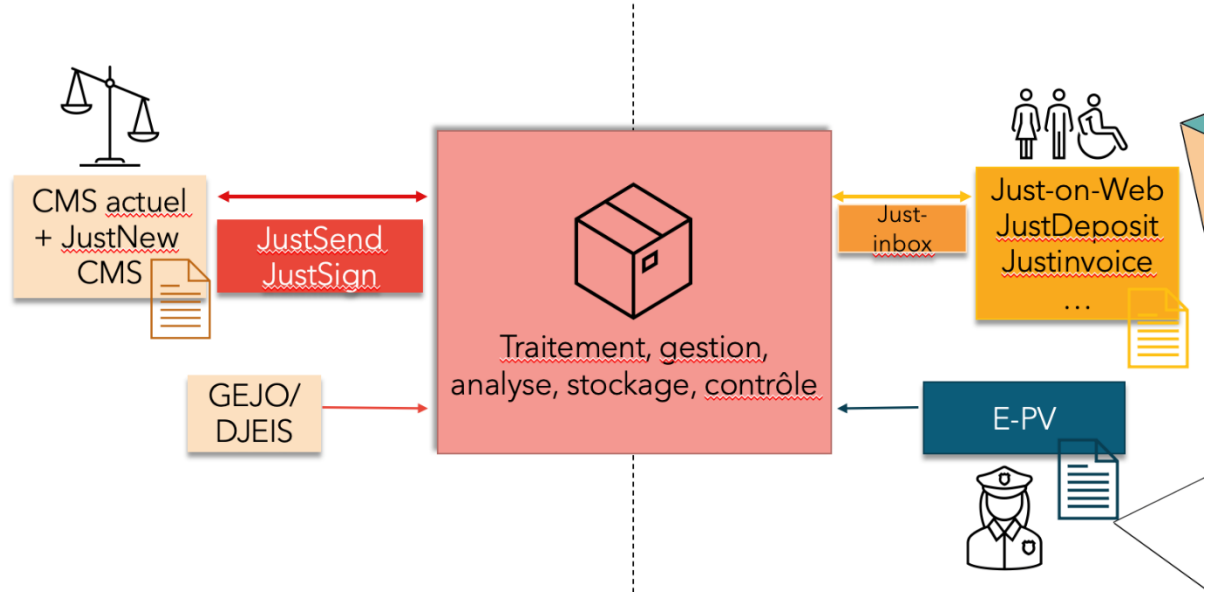

Figure 3. *Collecting all documents on one digital location (case management system) thanks to the building blocks (Digital Transformation Office, 2022)*

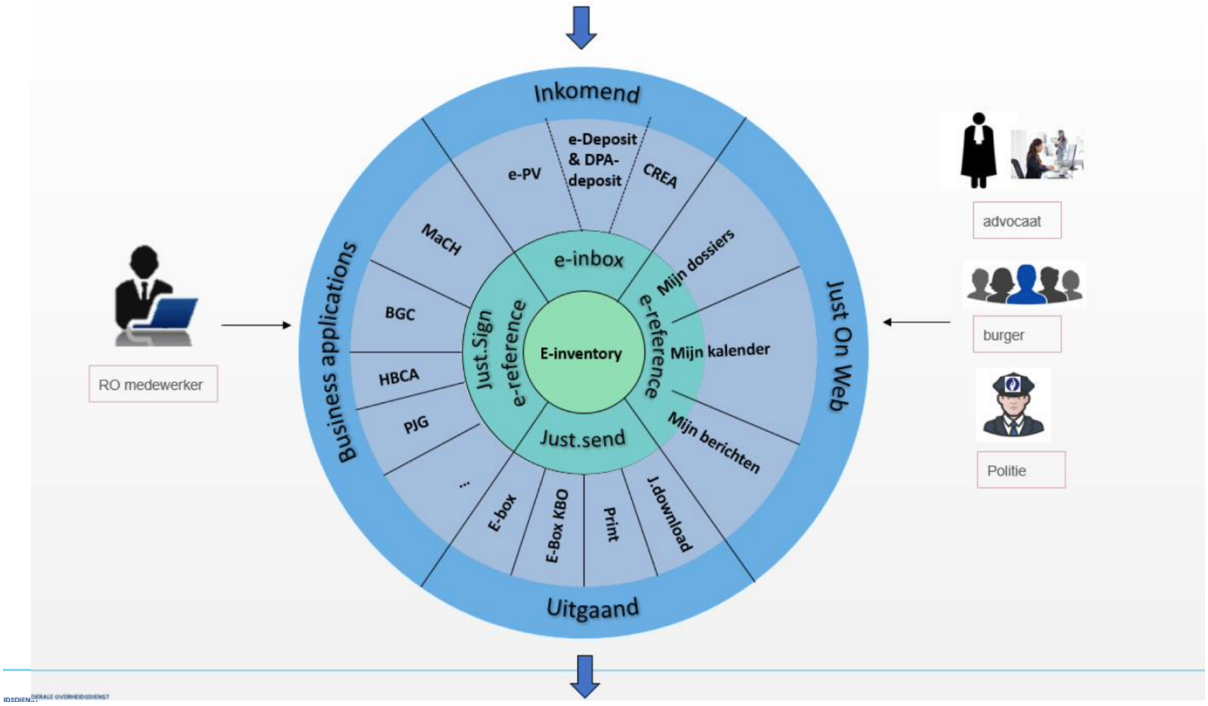

Figure 4. *Visual overview of the modules/ building blocks (Digital Transformation Office, 2022)*

Yet, as the minister Van Quickenborne emphasized, justice cannot transform itself. A vital component of digitalizing the justice system involved collecting feedback from frontline users. Consequently, the Digital Transformation Office (DTO) and the Steering Committee for the

Digital Transformation Plan were established to integrate these insights (Arrêté Ministériel portant des mesures d'organisations internes en vue de la coordination, la rationalisation et l'accélération de la digitalisation de la Justice, 2021). These committees include representatives from the Minister's Strategic Unit, FPS Justice, specifically its ICT Support Service, as well as the College of Courts and Tribunals, the Public Ministry College, and the Court of Cassation. Additionally, each project (referred to as building blocks) was accompanied by a working group composed of practitioners directly involved with the ongoing development of the application. As Vincent Van Quickenborne himself stated: "The digital transformation of Justice is in full swing. However, the idea of a massive revolution spearheaded by a prominent minister of justice is a myth. Digitalization is accomplished by all of us together," addressing judicial actors during the "Digital Summit: Trust in Digital" event in Brussels in December 2022.

Despite ambitious targets and significant investments, a recent critical examination of the announced, ongoing, and realized digitalization projects in the Belgian justice system revealed persistent shortcomings. According to the Court of Accounts report (2024), despite financial investments estimated at 140 million euros for 2023, the digitalization of the justice system suffers from fragmented governance, lack of a unified strategy, and inadequate budgetary oversight. This situation has led to disjointed initiatives managed by separate agencies, creating inefficiencies and competition rather than collaboration. Governance issues persist, with the DTO struggling to fulfil its mandate, and over-reliance on external consultants raising concerns about financial sustainability. Additionally, budget control is weak, with RRF funds potentially misallocated and lacking clear expenditure tracking. These concerns were strongly echoed by the Nieuw-Vlaamse Alliantie political party (N-VA), which denounced the digitalization policy as a failure and called for judicial accountability. The party particularly highlighted emblematic cases such as the *E-sign* project, which absorbed significant funds but was never completed, arguing that such examples illustrate both the waste of resources and the lack of effective oversight in the use of European funds (Freilich, 2025).

3.5. Navigating change within judicial reforms

Over the past thirty years, the focus of political strategies to modernize the judicial sector has been on the integration of organizational, managerial, and digital innovations within Belgian

jurisdictions. These strategies have evolved through four distinct phases. Initially, until 2007, the approach was ambitious yet quickly criticized by legal professionals. This was followed by a preference for "modular" and "collaborative" strategies until 2014. In these first two phases, digitalization played an instrumental role, primarily serving to support planned organizational and managerial reforms. A pivotal shift occurred when the government began to view it as an "absolute necessity" (Belgian Government, 2014, p. 111), indicating that digitalization has come to be seen as essential in the subsequent phases — and remains so today. Since 2015, driven by the "Pot-Pourri laws," the digitalization of courts and tribunals has moved at the forefront of the Justice Ministers' priorities. Hence, the modernization of justice today appears less explicitly tied to NPM frameworks and increasingly synonymous with digital transformation.

The reception of digital reforms among judicial actors remains ambivalent. Some practitioners perceive digital tools positively, particularly for the operational conveniences they bring to their daily work. Others, however, highlight the poor implementation of these tools, a lack of adequate resources and equipment, and frustrations with the rapid pace and sheer number of reforms introduced in a short time. These dynamics contribute to a broader sense of fatigue and difficulty assimilating the numerous changes (Schiffino et al., 2023). Furthermore, experts and practitioners have questioned the actual impact of these reforms, noting that many of the measures introduced by successive justice ministers since 1999 often exist more in formal norms than in concrete practice. This discrepancy highlights a critical tension between policy ambitions and organizational realities, exacerbated by political variability. This trajectory must be understood within the institutional and political specificity of the Belgian context, where fragmented governmental coalitions and ubiquitous federalism create a complex and often slow-moving framework for reform. As Vigour (2018) notes, this institutional configuration explains why judicial reforms in Belgium are often cautious, extensively negotiated, and sometimes incomplete or contested in their implementation. Unstable coalitions and persistent community tensions further undermine the long-term coherence of reform agendas. Legislative initiatives passed under one government may be reconsidered, weakened, or even abandoned by the next, whose coalition makeup and ideological orientation may differ significantly. As a result, reforms often materialize in the form of half-measures or paradoxical scenarios, where laws are formally adopted but poorly enforced — due either to the lack of sustained political support or to insufficient financial and organizational resources to ensure full implementation.

While the continuity observed under Belgium's last three justice ministers (Koen Geens, Vincent Van Quickenborne, and Paul Van Tigchelt) illustrates a relatively stable approach to the modernization and digitalization of the justice system, there is no guarantee that future leadership will prioritize these initiatives, leading to potential shifts in focus, funding reallocations, or changes in strategic direction. The four phases we discussed reveal how the objectives set by different ministers can significantly influence the direction and focus of reforms within the judiciary. Each minister's specific agenda influenced the speed and nature of organizational, managerial, and digital integration within the judiciary. Such political variability underlines the precarious nature of public policy reform highlighted by Vigour (2018) — while some initiatives successfully build on previous efforts, the resignation of a minister or electoral results could abruptly alter the course of reforms. For instance, since February 2025, Annelies Verlinden has held the office of Minister of Justice, succeeding Paul Van Tigchelt. While she inherited ongoing digitalization projects, her early initiatives have placed greater emphasis on addressing structural and organizational deficits in the justice system — notably improving working conditions for staff through a "leverage plan," requesting €1 billion in additional funding for infrastructure and efficiency, and tackling chronic prison overcrowding. This indicates a shift in focus from the ambitious digital transformation model championed by her predecessors toward broader institutional and resource-oriented reforms. This situation could fragment the approach to long-term goals like the comprehensive digitalization of the judicial system, emphasizing the challenge of maintaining a consistent policy direction across successive administrations.

Below is an integrative table summarizing the key reform phases in the Belgian judicial system, indicating the justice ministers during each period, the major reform measures and the key digital tools and initiatives introduced.

Time period and phase	Justice Minister[25]	Major reform measures	Key digital tools and initiatives
The revolution: Centralized management and global digitalization efforts (1999-2007)	**Lorette Onkelinx** (2003 - 2007)	Copernicus Plan	Phenix Project ***MaCH***
A localized, modular and cooperative strategy (2008 – 2014)	**Stefaan De Clerck** (2008 – 2011) **Annemie Turtelboom** (2011 – 2014)	Law of 2013, amending the judicial districts and the Judicial Code to enhance the mobility of members of the Judicial Order Law of 2014, on the introduction of autonomous management for the judicial organization	Locally crafted digital tools like ***juriDict*** A hundred smaller IT projects initiated by the FPS Justice
Market-driven & outsourced reforms (2015 – 2020)	**Koen Geens** (2014 – 2020)	Pots Pourris Laws Promoting digital entrepreneurship among legal professionals	*Dpa deposit* ***RegSol*** *JustRestart*
Holistic digital transformation ambitions (2020 – Feb 2025)	**Vincent Van Quickenborne** (2020 – 2023) **Paul Van Tigchelt** (2023 – Feb 2025)	Implementation of a structured four-step roadmap Cooperation from the Judiciary	*JustX* database *e-box* network Central Registry for Judicial Decisions *Just-On-Web* portal Additional initiatives for the prison system

Table 1. *Evolution of digitalization in the Belgian justice system: phases, Justice Ministers, reform measures, and digital initiatives (1999–2025)*

[25] Due to the transitional and interim nature of some appointments, not all justice ministers from 1998 to February 2025 are included in this table. We have chosen to select only those previously mentioned and directly associated with a reform or initiative in the digitalization of justice.

PART TWO — GENERAL METHODOLOGY

CHAPTER 3 — BUILDING A RESEARCH DESIGN

Chapter 3 shifts our discussion from what we study — the infrastructural embedding of digital innovations in the justice system — to how we conceptually and methodologically make sense of it. The primary objective of this chapter is to articulate the conceptual foundations and methodological choices underpinning our empirical inquiry. It introduces and integrates two complementary analytical frameworks: a socio-technical perspective rooted in ANT, and an organizational perspective derived from the SOA. Additionally, we develop an "iterative lifecycle" heuristic to demonstrate how digital tools evolve dynamically through interconnected phases of development, design, maintenance, and day-to-day use. By the end of Chapter 3, the reader will have a clear understanding of the conceptual lenses and methodological reasoning guiding our approach.

1. The research foundations and anchors

1.1. The research context

This thesis is rooted in the well-established research traditions of the Centre for Sociological Research and Interventions (CRIS) at the University of Liège (ULiège)[26] which is committed to advancing both research and sociological practice in the areas of organizational analysis, collective and public action, and the social challenges faced by our societies. Conducted as part of the *DiJusT* (PDR) project (Dubois & Michaux, 2020), this thesis explores digital change is the justice system through a series of in-depth case studies. In light of the COVID-19 pandemic's demonstration of the urgent need for digital tools in maintaining public services — and in addressing digital divides —, the *DiJusT* project sets out to document how innovative digital tools transform legal research, writing, anonymization, and data extraction. Moreover, it assumes that these tools influence the localized production of law by reshaping the interactions and knowledge-exchange processes among practitioners (Latour, 2002). To address these questions, the project's design explicitly embraced a case study strategy by organizing its inquiry into distinct phases. The first phase focused on documenting the development and use of digital innovations across six diverse

[26] See the Center for Sociological Research and Interventions (CRIS) website: https://www.cris.uliege.be

jurisdictions, each serving as a separate case study (Yin, 2009). These case studies were structured around the stages of problematization, interessement, enrolment, and mobilization, involving various practitioners (such as clerks, publishers, judges, lawyers, administrators, IT professionals, etc.) and objects (including documents, tools, algorithms, codes, etc.) (Callon, 1986; Dubois et al., 2019). The second phase involved comparing the local and reciprocal adaptations between these digital systems, the users, and the organizational structure of the courts. This comparison aimed to evaluate the extent to which these tools were integrated — or potentially circumvented or repurposed — within organizational processes and structures. In the third phase, the project aim was to analyse the influence of these digital tools on legal research, writing, and decision-making practices, which are integral to the creation and dissemination of law.

Although previous studies had already explored the political, legal, and technical aspects of some IT related projects in Belgium — e.g. the Phenix and DPA-deposit projects — (Hubin, 2017; Mougenot, 2017), there has been a notable lack of empirical studies and cross-sectional analyses on these topics (Dubois & Schoenaers, 2019), especially in relation to the aforementioned innovations. The *DiJusT* project aimed to fill that gap.

1.2. Designing a research project that was not initially ours

Given that the research object entrusted to us within the *DiJusT* project was already clearly defined — namely, the study of digital innovations in the judicial sector — and "imposed on us" we did not encounter issues of "distancing" (Beaud & Weber, 2010) or challenges of "rupture" (Van Campenhoudt et al., 2017). Furthermore, The *DiJusT* project was grounded in literature from ANT (Callon, 1986; Latour, 1990; Law, 1992) and the SOA (Crozier & Friedberg, 1977), which together have become the backbone of this thesis. Consequently, our primary task was to familiarize ourselves with key texts from these conceptual frameworks, which have decisively shaped our epistemological stance and informed our research design.

The case-study strategy we adopted flows directly from the *DiJusT* Project and its conceptual grounding: to trace socio-technical networks one must observe them in situ, across multiple sites and moments of translation. Yet the field soon compelled a series of deliberate departures from the project's initial guidelines. Each jurisdiction presented unforeseen actors, tools or controversies, and each demanded analytic fine-tuning. That iterative recalibration made our

methodological journey a reflexive, evolving toolkit. The reasoning behind each intentional departure is detailed in the next sections. Such ongoing adjustment was not a methodological accident but a direct consequence of our abductive mode of inference.

1.3. An abductive mode of inference

An abductive mode is particularly suited for this research because it reflects the iterative movement between empirical fieldwork and the development of theoretical insights that informed each stage of the thesis. Rather than starting from fixed hypotheses or relying on linear logic, we maintained a continuous dialogue between the field and conceptual frameworks (Charmillot & Dayer, 2007; Thomas, 2010). Propositions and interpretations emerge gradually, shaped by what the empirical material suggested, but also by the researcher's prior knowledge, intuition, and critical reflection (Charmillot & Dayer, 2007).

The concept of abduction, first introduced by the American pragmatist philosopher Charles Sanders Peirce (1934, p. 117), describes the process by which new propositions are generated to make sense of surprising or puzzling phenomena. For Peirce, abduction was a creative leap, rooted in the interplay of experience, intuition, and empirical insight. This abductive mode of inference underpins our research design: it reflects our commitment to building knowledge that is situated and empirically grounded. Abduction also acknowledges the role of the researcher's subjectivity: it "embraces the researcher's prior experience through phronesis(...) in a manner that would not undermine but rather enhance the research" (Dubois & Gadde, 2002, p. 2) and makes the interpretive process explicit rather than hidden. In this view, subjectivity and intersubjectivity are indispensable tools — rather than barriers — for knowledge creation (Anadon & Guillemette, 2006). Far from being a weakness, the involvement of the researcher becomes a resource for sense-making, especially in contexts marked by uncertainty, negotiation, and change. With hindsight, we realize the importance of approaching our later case studies with a more developed analytical perspective than we had at the beginning. Each new case site brought its own complexities, requiring fresh insights. This iterative learning enhanced the robustness of our findings.

1.4. Positioning the researcher: A relational ontology and pragmatic epistemology

This research is grounded in a relational ontological posture and a pragmatic epistemology, both of which inform our approach to digital innovations in justice. Rather than assuming pre-given entities with fixed properties, a relational ontology views social reality as constituted through dynamic and situated interactions among heterogeneous actors — human and non-human alike (Latour, 2005). In this view, organizations, technologies, norms, and professional expertise are not stable categories but emergent configurations, continuously enacted, negotiated, and reconfigured in practice (Lemieux, 2012; Musselin, 2005). This ontological stance aligns with our research objective: to understand how digital infrastructures take shape within judicial institutions not in the abstract, but through their development, design, maintenance and use in concrete settings. Epistemologically, we adopt a pragmatic posture, not as a philosophical stance (Dewey, 1938; Pierce, 1934), but as an empirically grounded mode of inquiry rooted in situated action, iterative reasoning, and abductive logic. Knowledge is understood here as generated in, by and through action refined in dialogue with theoretical insights (Dubois & Gadde, 2002; Pierce, 1934). This resonates with our processual, case-based design and supports a mode of investigation sensitive to contextual meaning-making. Our aim is to understand how actors react, adjust, and justify themselves when confronted with controversies or contested situations. The inquiry thus rests on close attention to situated action, ordinary reflexivity, and the processes through which the social world is put to the test, treating these moments as empirical entry points to observe institutional and organizational dynamics and change (Akrich et al., 2006; Lemieux, 2012). This pragmatic epistemology also reflects an action-centred orientation: we focus on what actors do, how they justify their actions, and how they engage with rules, tools, and institutions in everyday practice. It draws from traditions that emphasize empirical inquiry into situated action — such as ANT (Callon, 1986; Latour, 1990), SOA (Crozier & Friedberg, 1977), and socio-material approaches (Barad, 2003; Orlikowski, 2007; Suchman, 2007).

Taken together, this relational ontological posture and pragmatic epistemology provide the foundations for distinguishing between three complementary registers of analysis: ontological (how entities emerge through relations), epistemological (how actors negotiate and configure socio-technical arrangements), and normative-epistemological (how ways of knowing and ways

of doing are mutually stabilized). These registers will be articulated in this thesis through the concepts of *co-constitution*, *co-construction*, and *co-production*. Although these notions are sometimes used interchangeably in the literature (Feldman & Orlikowski, 2011; Lascoumes & Le Galès, 2005; Latour, 2005), each refers to a distinct conceptual register. In this dissertation, we deliberately draw on different traditions that mobilize these terms, but we adopt a differentiated and situated usage, aligning each concept with the empirical material and theoretical commitments of this research.

Co-constitution is situated within a strictly ontological register, most clearly articulated in Actor–Network Theory (Callon, 1986; Latour, 2005) and in socio-material approaches to practice (Barad, 2003; Feldman & Orlikowski, 2011; Orlikowski, 2007; Suchman, 2007). It refers to a relational and socio-material ontology in which entities — whether human, technical, or normative — do not exist independently but are mutually defined through their relations. Actors and artefacts are thus not given in advance; they emerge, transform, and acquire their identity in and through practice. This is not simply about collaborating or working together but about becoming different through the relationship. A judicial case-management system, for example, cannot be conceived as a neutral tool external to judges: it actively participates in redefining what it means to "be a judge" or to "be a clerk" in a digital environment, while its own functionalities and uses are in turn constituted through interaction with judicial practices. In this sense, co-constitution highlights the relational ontology that underpins this thesis and allows us to trace how judicial actors, and digital artefacts take shape through one another.

Co-construction refers to an epistemological pragmatic and interactional register. In this perspective, the ontology of the elements involved is not fundamentally questioned: actors are treated as already instituted, but they engage in processes of collaboration, adaptation, and negotiation in order to assemble systems and make them work in context. Co-construction emphasizes the situated dynamics of compromise and adjustment through which socio-technical arrangements take shape. This usage draws on the sociology of organized action (Crozier & Friedberg, 1977) and the sociology of public action (Halpern et al., 2014; Lascoumes & Le Galès, 2005), both of which highlight how shared understandings of instruments, rules, and practices are collectively fabricated through interaction. In this sense, co-construction points to the collective and negotiated fabrication of digital infrastructures, without necessarily adopting a relational

ontological stance.

Co-production refers to the entanglement of social and technical orders, emphasizing the impossibility of disentangling normative dimensions (what ought to be done) from epistemic ones (what is considered legitimate knowledge) (Jasanoff, 2004). It is not reducible to the interaction of actors, nor to an abstract ontological relation; rather, it highlights how ways of knowing and ways of doing are mutually stabilized. In this sense, co-production underscores that visions of justice and modes of knowledge about justice are inseparable: modernizing justice is never a purely political choice nor a purely technical implementation, but a process through which reforms and instruments shape one another. Digital tools such as *MaCH*, *RegSol*, or *juriDict* embody normative assumptions — about efficiency, transparency, or accountability — that influence how justice is imagined, while simultaneously reconfiguring these assumptions through their use. In this respect, instruments are sites of co-production between knowledge and power, between technique and politics (Lascoumes & Le Galès, 2005). In this thesis, co-production functions as a transversal theoretical frame to analyse how reform projects and digital infrastructures jointly define what it means to deliver justice in practice, producing multiple and situated forms of it. These three terms — co-constitution, co-construction, and co-production — will be mobilized analytically throughout the thesis to distinguish between different registers of transformation observed across the case studies. Together, they provide conceptual tools to interpret how socio-technical arrangements emerge through relations, are negotiated in practice, and are stabilized through the entanglement of normative and epistemic orders. These research foundations and anchors rest on two action-centred perspectives that will be developed in the following section.

2. Action-centred perspectives: Conceptual roots, methodological routes

Our research process was shaped by two complementary perspectives: each grounded in a distinct action-centred conceptual framework. The first is the socio-technical perspective, rooted in Sciences and Technology Studies and more particularly, ANT, which posits that technology and organizations — and thus judicial administration — are co-constituted (Callon, 1986; Latour, 1990). The second is the organizational perspective, anchored in the SOA, which emphasizes actors' strategies, negotiations, and their roles in co-constructing the adoption and use of digital

tools within organizations (Crozier & Friedberg, 1977). This lens highlights both socio-technical entanglements and the organizational arrangements, professional routines, and steering mechanisms that govern digitalization. Accordingly, we assume that practices arise from situated interactions among heterogeneous actors and that agency is distributed across people, artefacts, and institutional arrangements. Our research design is shaped by these conceptual frameworks and by our chosen epistemological stance. The next sections explore the theoretical foundations of both perspectives in greater depth and explain how they informed our methodological choices. Although these two traditions overlap in many respects, they also bring distinct methodological contributions.

2.1. The socio-technical perspective

The socio-technical perspective, grounded in STS — particularly ANT — emphasizes that technology and organizations mutually shape each other (Akrich et al., 2006). This approach moves beyond technical analyses alone, highlighting the interdependence between digital tools and the social, political, and professional contexts within which they emerge and operate (Williamson, 2016). Digital tools such as *juriDict*, *RegSol*, and *MaCH* do not simply address technical requirements; rather, they embody specific socio-political visions through concrete technical decisions (Carmes, 2008). Designers translate policy goals and administrative visions into the technical specifications of these tools. For example, *juriDict*'s design decisions might determine whether legal documentation becomes centralized, *RegSol* assigns specific competencies for managing insolvency cases, and *MaCH* implements managerial reforms by standardizing procedural workflows.

2.1.1. Mutual shaping of technology and society: Insights from ANT

ANT, initially proposed by Callon (1986) and Latour (1990), emphasizes the mutual co-constitution of technology and society. This conceptual approach rejects both technological determinism — where technology is seen as driving social change (Barley, 1988; Kling, 1991) — and social determinism, which views technological development solely as a product of human interactions (Mauthner & Kazimierczak, 2018). Instead, ANT advocates for a balanced approach that recognizes both human and non-human entities (actants) as equally influential participants in shaping organizational practices and structures (Callon, 1986; Latour, 1990; Law, 1992). ANT,

also referred to as the sociology of translation, emerged from studies examining scientific knowledge production, specifically exploring the relational networks underpinning technological and scientific innovations (Bernoux, 2006; Callon & Latour, 2013). Central to ANT is the concept of "translation," a dynamic process describing how diverse actors — human and non-human — come together to achieve shared objectives. In the context of judicial systems, the implementation of tools like *juriDict* or *MaCH* requires the involvement of various actors with different interests and expertise. These actors — ranging from legal professionals to IT technicians — negotiate, adjust, and transform both the tool and their practices through continuous interaction. The translation process emphasizes the continuous displacements of goals, interests, devices, human beings, objects, and inscriptions (Callon, 1986, p. 223). Throughout the process, some actors redefine their short-term interests to align with those of other stakeholders. Other actors (or *translators*) occupy a central position among these stakeholders (*inter-esse*) in order to formulate a common objective that creates meaning (problematization), overcomes divergent interests and redefines identities (*interessement*), roles (*enrolment*), behaviours and positions (*mobilization*).

2.1.2. Following action through all human and non-human actors

This empirical-conceptual framework initially requires clarifying the relationship between technology and society. Its starting point is to look at the networks composed of these heterogeneous elements, human and non-human. It explores the formation of these socio-technical assemblages and their relational effects. A fundamental paradigm shift occurs with the inclusion of "objects" in analysing and explaining action sequences. Anything that contributes to or changes a given situation must be considered as an "actant." This concept encompasses entities acting through distinct trials and devices. Furthermore, it includes the entities known as "non-humans," which are acknowledged as actors with their own agency. This insight is key, as it leads to an approach that equally considers humans and non-humans as symmetric participants in the world. It emphasizes the methodological refusal to give precedence to one over the other, ensuring an equitable consideration of all actors involved. ANT introduces a methodological imperative: to "follow the actors themselves" (Latour, 2005). As Vibert (2023) puts it, ANT invites us to describe the social world as "flat and horizontal," meaning we should trace associations without privileging certain structures or categories from the outset. Technology and humans thus relate through an entanglement in practice as equivalent, and non-distinct "actors" in the network of an organization

or process (Orlikowski, 2010). This relational approach enables ANT to effectively capture the complexity and contingency involved in implementing digital tools within organizations (Vibert, 2023).

2.1.3. Conducting fieldwork through ANT

Latour (2007) posits that the sole task of sociological work is to write "reports", meant to synthesize the multiplicity and complexity of always partial and limited data. These reports are “artificial” in the sense that they are written constructions, but also “objective” because they aim to faithfully represent how real-world entities — like microbes in science or legal tools in justice — interact and construct effects. The concept of network helps describe these interactions as flows of translation, where meaning, roles, and power are constantly negotiated between actors. Latour also argues that a good sociological text should be well-written, not to embellish but to reveal the complexity of reality. Like scientific work, sociology gains objectivity by incorporating multiple, sometimes resistant, perspectives — what he calls "objectors.” In this way, description becomes a method of interpretation: to describe fully is already to make the world understandable. That is why Latour (2007) insists that science only works through the particular — by focusing on specific, situated cases rather than universal truths.

This leads to one of ANT’s core methodological principles: to describe before interpreting. Researchers are encouraged to avoid imposing pre-existing theories or categories on the field (Latour, 2005), since actors themselves are capable of producing their own interpretations and justifications. As such, ANT leans toward an empirical and inductive approach, aiming to uncover how human-technology relationships evolve in real time (Blaha & Hislop, 2022). This methodological posture deeply influenced our own research. Rather than applying a predefined framework from the outset, we allowed ourselves to be guided by what emerged in the field. By giving priority to thick descriptions of actors’ practices and relationships, we were able to ground our interpretations in their lived experiences. Methodologically, it justifies fine-grained qualitative techniques such as follow-the-artefact observations, document walkthroughs, and network mapping. Throughout the fieldwork, we followed this logic by systematically producing descriptive and synthetic reports of what the actors shared with us — staying close to their words, their contexts, and their ways of making sense of the tools they use.

2.2. The organizational perspective

Complementing the socio-technical approach, the organizational perspective emphasizes the internal dynamics within organizations, focusing on professional routines, institutional arrangements, and strategic negotiations that shape digital tools. These are embedded in complex interdependencies, interactions, and continuous processes of adaptation that shape their integration into organizational settings. They often become arenas of negotiation, where technological constraints intersect with localized organizational needs and practices. Exploring these internal processes is essential to understand how actors actively appropriate and reshape digital tools. The SOA (Crozier & Friedberg, 1977) provides a robust conceptual framework to analyse these complex interactions.

2.2.1. Actors, authority, and power: Foundations of the sociology of organized action

The SOA, also known as strategic analysis, investigates the actual functioning of organizations beyond formal rules. This perspective originated with Crozier's empirical studies, notably his influential research in *The Bureaucratic Phenomenon* (Crozier, 1971), examining French public administrations. Rather than emphasizing formal organizational structures or explicit goals, Crozier analysed interpersonal relationships fostered by bureaucratic rules. His observations revealed that bureaucratic operations depend heavily on impersonal rules, centralized decision-making, and hierarchical segmentation, which collectively create parallel power dynamics. Within these dynamics, actors strategically exploit "areas of uncertainty" to preserve autonomy and maintain power relations (Kuty, 2007). Crozier and Friedberg emphasize concrete interactions between actors, asserting that organizations emerge from ongoing, collectively negotiated processes — power relations — rather than fixed structures and formal rules — authority (Crozier & Friedberg, 1977).

2.2.2. Conducting fieldwork through the SOA

To understand organizations as collective process, the authors propose an inductive posture based on three foundational postulates. These postulates also guide empirical research and analysis (Musselin, 2005).

- First, actors rather than structures constitute the primary unit of analysis. While institutional, social, and organizational structures — rules, procedures, and routines — are significant, they alone cannot fully determine actors' behaviours (Bernoux, 2006). Actors maintain relative autonomy, enabling them to navigate and leverage organizational rules, resources, and technologies strategically (Friedberg, 1993). Through ongoing negotiations and reinterpretations, actors develop strategic arrangements that serve their interests. This places individual and collective agency at the heart of organizational dynamics, though structure is not dismissed (Crozier & Friedberg, 1977).

- Second, actors' behaviours are rational, yet this rationality is context-specific rather than universally optimizing. Following Boudon (2003), actors act according to “good reasons” unique to each situation. These reasons are contingent upon their particular interpretations of interests and constraints, continuously evolving in response to their environment and interactions with others.

- Third, power is not derived from formal hierarchical positions. Instead, power emerges through strategic relationships, particularly by managing "areas of uncertainty," defined where formal rules or established procedures are either lacking, unclear, or insufficient. Such ambiguities create opportunities for actors to assert influence and autonomy, as actors who control these zones of limited or absent regulation can enhance their autonomy and ultimately their capacity for action. Thus, power is diffuse, continuously negotiated through subtle, ongoing interactions among actors.

From this perspective, organizations are understood as dynamic processes continuously shaped by strategic interactions among actors navigating constraints and opportunities (Bernoux, 2006). Organized action, therefore, is fundamentally interactive, shaped by actors, their interactions, and their capacity to influence structures and negotiate rules (Musselin, 2005). Power relations are never entirely fixed but are continually adjusted in response to opportunities, constraints, and actors' strategies. This stance compels research to observe situated routines, strategic games and institutional configurations. Interviews are particularly revealing as they aim at capturing actors' perceptions of their situation, their behaviours and practices, the constraints they encounter, the resources available to them, the motivations behind their actions, the relationships they maintain,

and the nature and content of those relationships. Special attention is paid to the practices, the meanings underlying the interactions and the local arrangements. Each interview privileges the individual's situated experience and fosters empathetic engagement from the researcher. Through this process, the researcher attempts to reconstruct — via systematic comparison across interviews — the subjective logics actors employ, thereby refining the empirical material into a coherent research problem (Lemieux, 2012; Musselin, 2005). These insights were instrumental in shaping how we structured our interview grids, observed actor practices, and interpreted the narratives shared with us.

3. Conceptual-methodological synergy: Building a unified framework

3.1. Bridging the perspectives with socio-materiality

Socio-materiality serves as a conceptual bridge between ANT and SOA, integrating their insights to examine how organizations and technologies co-emerge and continually shape each other in practice (Orlikowski, 2010). Like ANT, socio-materiality advances a relational ontology in which humans and digital infrastructures are not separate entities but mutually constitutive, constantly reshaping each other through dynamic interactions (Suchman, 2007). At the same time, it shares with the SOA an emphasis on organizational practices, routines, and negotiations, thereby situating the co-constitution of technologies and organizations within the concrete contexts of work and institutional dynamics.

At the core of this perspective is a distinctive conceptualization of materiality and discourse as interdependent processes. Materiality is not treated as a fixed or inherent property of objects, but as an ongoing process of becoming through discursive practices. Conversely, discourse itself is embedded in and dependent on material contexts (Blaha & Hislop, 2022; Suchman, 2007). This inseparability of meaning and material conditions dissolves boundaries between technology and human activity, allowing us to examine how socio-material assemblages take shape in practice.

Within this framework, agency is understood as emerging from situated practices — practices shaped by specific historical, cultural, and material conditions. This situated action framework (Suchman, 2007) highlights how organizational phenomena are constituted through ongoing interactions between humans and technological tools (Mauthner & Kazimierczak, 2018). Actions

and configurations within organizations are thus viewed as emergent, dynamic, and contextually contingent. By adopting a socio-material lens, this thesis sets the focus on examining how technologies, practices, and actors are continuously reconfigured in relation to one another. This bridging perspective provides the conceptual tools to explore judicial digitalization not as a one-directional process of implementation, but as the co-constitution of digital infrastructures, organizational routines, and judicial practices.

3.2. From description to interpretation

The two action-centred perspectives (socio-technical and organizational) converge around a shared commitment to empirical grounding and inductive exploration in two fundamental ways. First, they approach fieldwork not as a space for hypothesis testing, but as a site to be explored in all its complexity. Here, the field becomes a place where mechanisms and concrete modes of operation are uncovered through immersion and exploration. Second, these perspectives rely on empirical data to progressively shape the research questions and problematization (Musselin, 2005). Rather than privileging macro-structures or fixed categories, both frameworks emphasize the situated description of practices, relationships, and interactions — interpreted through the meanings that actors attribute to them (Crozier & Friedberg, 1977; Latour, 2005). The shared focus on interactions and organizational micro-dynamics gives preference to "lower-level actors" and their everyday work — rather than elites — as a way of producing insights into how systems function. The researcher's role is to uncover the arrangements and strategies through which actors succeed in cooperating and maintaining stable forms of collective action (Musselin, 2004).

Hence, in both traditions, description is central: not only as a preliminary step, but as a key mode of analysis in its own right. Yet, while description is the starting point, it is rarely sufficient. Even when we attempt to "follow the actors themselves," (Latour, 2007, p. 22) as ANT recommends, we inevitably bring implicit analytical frameworks to the field (Vibert, 2023). Latour acknowledged on multiple occasions that ANT occupies the "difficult to explain" position of claiming to simply "collect the actors' statements" while "it nevertheless adds something they never say" (Latour, 2009, p. 58) as he introduces powerful concepts such as "network," "translation," or "controversy." Therefore, ANT is laden with significant ontological assumptions, both descriptively (via the concepts it employs) and normatively (through the suggested orientations).

The same is true for the SOA, which — though inductive — relies on guiding postulates such as actor rationality**,** strategic interaction**,** and the use of power through areas of uncertainty (Crozier & Friedberg, 1977). These postulates orient our attention and structure the way we make sense of what we observe, even if they are not imposed dogmatically. In that sense, theoretical interpretation becomes unavoidable and makes "pure" induction hardly achievable (Dubois & Gadde, 2002). An approach that is primarily inductive will inevitably involve instances of deduction, yet it retains its inductively oriented essence through a core commitment to exploring phenomena as experienced by the actors themselves (Anadon & Guillemette, 2006).

Accordingly, neither ANT nor the SOA can be reduced to strictly inductive methodologies. Both call for a movement beyond description: they invite researchers to interpret, connect meaning with structure, and explain how stable organizational arrangements are negotiated through situated interactions. This analytical shift — from observing what happens to interpreting how and why it happens — requires a mode of reasoning that bridges empirical data and conceptual insight. This is where abduction becomes essential. Action-centred conceptual frameworks like ANT and the SOA do not merely aim to describe tools and their uses, but to uncover the socio-technical dynamics and organizational practices that sustain them. In doing so, they call for a reasoning process that, while rooted in empirical observation, also allows space for theoretical interpretation and the development of "plausible explanations of the relational dynamics at play to emerge" (Dubois & Gadde, 2002, p. 7). Like induction, abduction begins with data from the field — but unlike induction, it acknowledges the guiding role of prior conceptual frameworks in shaping the search for meaning. Therefore, while our methodological posture is inspired by ANT and SOA, it is most adequately described as abductive (Vibert, 2023), rooted in both a socio-material and relational ontology and a pragmatic epistemology.

3.3. The iterative lifecycle of digital infrastructures

To translate the conceptual insights drawn from ANT and the SOA into methodological practice, this thesis adopts an iterative lifecycle approach on digital infrastructures to guide its empirical inquiry. This lifecycle should not be read as an analytical framework in itself; but rather, as a methodological tool that helps to structure how empirical material is approached and ordered. The lifecycle is composed of four interconnected and recurring phases: development, design,

maintenance, and usage. These phases are not understood as sequential stages, but rather as fluid and overlapping moments, marked by constant adjustments driven by ongoing interactions between human and non-human actors.

Development marks the first phase. From a socio-technical standpoint, it goes beyond the mere technical creation of digital tools. It is a negotiated and collective process involving multiple stakeholders — engineers, policymakers, future users, legal experts, and institutional actors — each bringing distinct expectations and interpretations for/of the tool (Akrich, 1990; Oudshoorn & Pinch, 2003). These diverse viewpoints influence not only what is built, but how and why certain functionalities are prioritized or excluded.

Closely linked to development is the second phase: design. Design is not limited to aesthetics or interface ergonomics; it also embodies values, assumptions, and power relations (Suchman, 1987). The configuration of functionalities, access rights, and workflows reflects institutional logics and political decisions. As Star and Ruhleder (2010) note, design choices are shaped by user feedback and broader institutional discourses, turning design into a site of both technical and political negotiation.

The third phase, maintenance, challenges the notion that technologies are ever truly "complete." Maintenance is understood as a continuous, attentive, and situated form of work aimed at preserving the stability of things. It is not about fixing what is broken but about preventing things from breaking in the first place (Denis & Pontille, 2022). In STS, maintenance is considered central to the ongoing life of a system, encompassing both technical interventions (e.g., system updates) and social practices (e.g., training, policy revision), which also includes responding to evolving legal frameworks (e.g., data governance, intellectual property) and shifting cultural norms (Star & Ruhleder, 2010). Maintenance underscores that technologies are living entities, shaped by continuous processes of adaptation (Suchman, 2007). It represents a form of care applied to technical objects and environments. Hence, maintenance relies on local, often improvised adjustments carried out by individuals "who take care of normality" (Denis & Pontille, 2022, p. 61). It often involves "invisible labour" (both technical and social) of system administrators, community moderators, IT support, etc., whose roles are essential yet underrecognized (Denis & Pontille, 2022; Star & Strauss, 1999). Unlike repair — typically visible, punctual, and dramatized

— maintenance is uneventful. Its political dimension lies precisely in its invisibility, as it sustains what is taken for granted. In doing so, it raises fundamental questions: what is deemed worth maintaining, how, and by whom? This highlights the ongoing communication required to keep tools functional, trusted, and relevant.

The fourth phase, usage, refers to the practices through which users appropriate, adapt, or even subvert digital tools in context. Usage is far from passive; actors reinterpret systems to suit their own routines, sometimes in ways designers did not anticipate (Oudshoorn & Pinch, 2003). This feedback loop may prompt further redesigns or policy changes: users shape the technology's ongoing meaning and function, and the technology structures user behaviours (Orlikowski, 1992).

Together, these four phases highlight the lifecycle of digital infrastructures as dynamic, recursive, and deeply socio-technical (see Figure 5). Rather than viewing tools as fixed objects introduced into static environments, this lifecycle foregrounds their emergent and negotiated nature. This iterative lifecycle provides the methodological foundation to organize and navigate the empirical material of the case studies conducted in this thesis. Each case focuses on one or more of these moments — development, design, maintenance, and usage — offering complementary perspectives on how judicial digitalization unfolds. By attending to different lifecycle phases across cases, the research captures a fuller, more nuanced understanding of how digital tools emerge, stabilize, and evolve within the justice system.

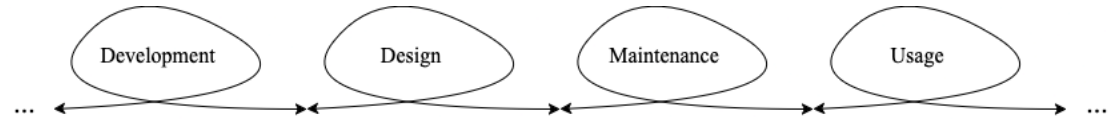

***Figure 5**. Visual representation of the iterative lifecycle of digital infrastructures*

4. Iterative collective case studies as research strategy

We now turn to our research strategy, which centres on case study inquiry consistent with our pragmatic epistemology that privileges situated action and distributed agency. A case study investigates a phenomenon of particular interest — the case — in its natural context with minimal researcher intervention (Yin, 2009). Because of its inherent flexibility, it is best understood as a research strategy rather than a research method: it imposes no proprietary technique but instead

invites whatever forms of data collection and analysis most effectively illuminate the phenomenon and address the guiding questions (Rosenberg & Yates, 2007). By using multiple data collection methods and triangulating these, the case study strategy yields a comprehensive, rich and detailed understanding of the phenomenon of interest and its context, from the perspectives of the various actors involved (Corbière & Larivière, 2020).

Methodologically, it is both deductive — working from initial statements or propositions — and inductive — letting patterns in the data reshape or extend theory (Yin, 2009). In practice this amounts to inference by pattern matching and iterative theory-building, so that description, interpretation, and theorization are dynamically interwoven. This dynamic stance fits well with an abductive mode of inference, which emphasizes a dialogic movement between empirical material and theoretical frameworks (Conaty, 2021). As Thomas (2010, p. 579) observes, the case study is "the ideal vehicle" for the intuitive insights that drive abductive social inquiry. Such studies are especially apt for topics that are poorly understood, socially complex, or highly context-dependent (Conaty, 2021) — a profile that matches our own field site. The immersive quality of abduction supports this type of investigation. Moreover, reflection plays a pivotal role in the abductive method, and case study research encourages such reflection by enabling interactions among the researcher and the field. The case-study strategy also complements our relational ontology. Case studies are especially valuable when the goal is to foreground the subjective perspectives of organizational actors. They have therefore become a mainstay in research on socio-technical and socio-material relations, allowing scholars to empirically investigate how discourse, practice, and artefacts co-constitute in organizational life (Blaha & Hislop, 2022; Law, 1992). For these reasons, the case study approach is ideally suited to investigate the socio-material practices and socio-technical infrastructures in contrasting judicial settings.

To translate these conceptual choices into a concrete research design, our strategy follows an iterative and collective case study design (Stake, 2010), which allows to capture the diversity of digital practices across the Belgian judiciary. Evidence from several judicial settings is gathered in successive cycles, each round informing the next, to deepen and broaden our grasp of the phenomenon under investigation. In every iteration, a case offers a new opportunity to test, refine, and adjust our understanding of how digital tools operate within the Belgian judicial system. Although we work with multiple cases, the project is not a conventional comparative study. We

do not perform cross-case analyses to identify variations, similarities, and potential causal relationships among cases. The "comparative" dimension is limited to pursuing a single research focus across distinct judicial contexts. Following Stake's (2010) collective-case rationale, we synthesize material from each case — iteration by iteration — to build a thorough and multi-faceted understanding of digital innovations while still being attentive to the particularities of every setting. By privileging within-case depth and cyclical learning over systematic cross-case comparisons, this strategy embraces the complexity and heterogeneity of our subject.

In this thesis, the integration of abductive reasoning with a relational ontology, a pragmatic and action-centred epistemology, and an iterative case study design provides a coherent and rigorous foundation. This articulation enables us to account for how digital tools are not merely implemented but co-constituted through socio-technical relations, co-constructed through negotiations, strategies, and organizational routines, and ultimately co-produced as part of broader normative and institutional visions of justice. By combining these elements, the research develops a layered and situated understanding of the "digital change" in the judiciary

CHAPTER 4 — EMPIRICAL ITINERARY

Chapter 4 turns conceptual framing into a work itinerary, detailing how our iterative collective case-study strategy, previously outlined conceptually, was enacted in practice. This chapter systematically explains how theoretical and methodological decisions were concretely translated into fieldwork, data collection, and data analysis activities. We first outline our process of selecting the investigated cases. Subsequently, the chapter provides a chronological account of how we entered each field site, gained access, and progressively refined our analytical framework through iterative data collection cycles. The chapter then describes our qualitative data collection methods (documentary analysis, interviews, and direct observation), the strategies employed to triangulate these diverse data sources and the thematic analysis used to process the data. Importantly, the chapter also introduces two additional analytical perspectives that emerged abductively from fieldwork and existing literature in sociology of justice: a socio-political perspective**,** examining how digital tools embed steering strategies and political rationalities into everyday judicial practices, and a professional perspective, exploring how digital innovations reshape boundaries, practices, and interactions among professional groups.

1. Translating our case-study strategy into practice

1.1. Case selection process

The *DiJusT* project was originally framed as an explicit comparative study with six separate case investigations. However, early fieldwork — alongside long-standing research on the Belgian justice system (Delvaux & Schoenaers, 2009; Piraux, 2017; Vigour, 2018) — revealed persistent contrasts between French- and Dutch-speaking communities, particularly in terms of professional practices, administrative cultures, and relations to reform (Barmeyer et al., 2019). To capture these cultural-linguistic differences, we redesigned the study to ensure that both language communities would be systematically represented. Independently of this, the research design also incorporated a methodological focus on the iterative lifecycle of digital tools, as detailed above, in order to account for the different phases — development, design, maintenance, and usage — through which digital infrastructures evolve. Hence, the study was restructured as an iterative collective case-study approach, organized around seven cases distributed across three jurisdictions, with both

language communities represented in each. The three chosen jurisdictions differ both in their institutional mandate and the type of litigation they handle: the Council of State (administrative litigation), the commercial courts (civil and commercial litigation), and the police courts (criminal and traffic-related civil litigation). Figure 6 situates these courts — in dark purple — within the structure of the Belgian justice system.

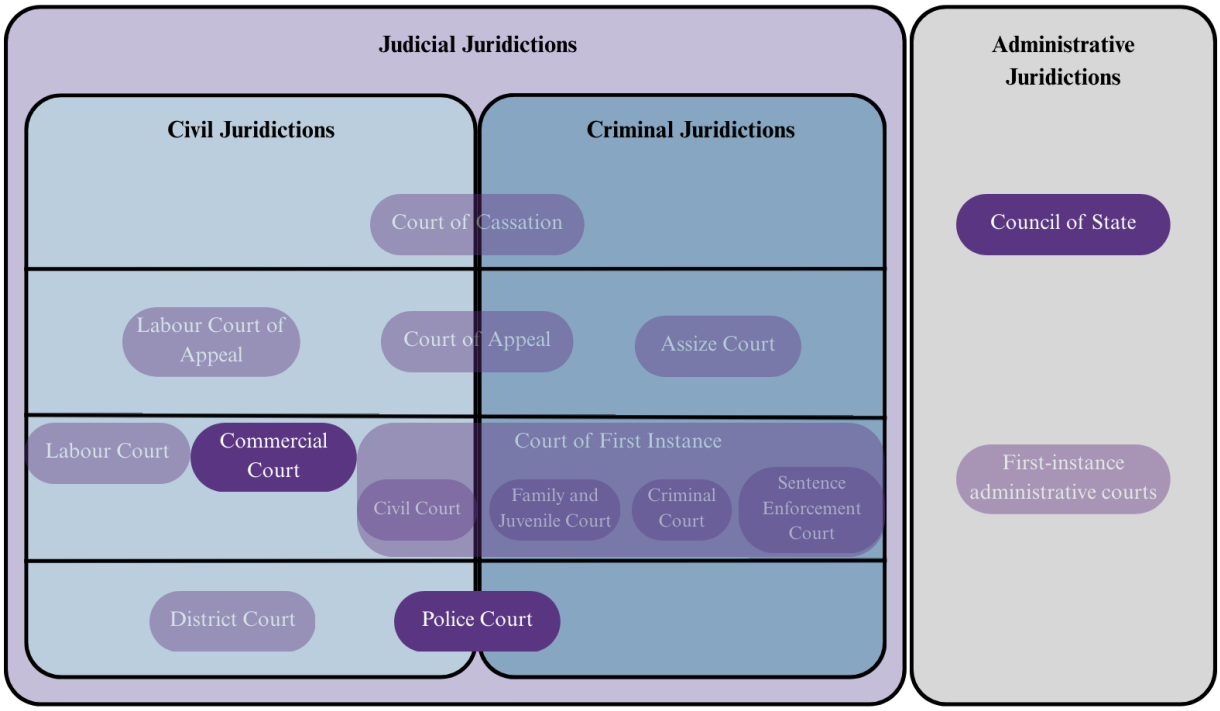

Figure 6. *Jurisdictions under examination within the structure of the Belgian justice system*

In each of these jurisdictions, we examine a specific digital tool — *juriDict* at the Council of State, *RegSol* at the commercial courts, and *MaCH* at the police courts — each emblematic of a distinct phase in the broader trajectory of judicial modernization. As discussed in the contextualization part, these phases move from a revolutionary period characterized by centralized management and sweeping digitalization, to a phase featuring localized, modular, and cooperative initiatives, and finally to a more recent phase driven by market-oriented logics and outsourcing strategies.

Within each jurisdiction, individual courts were selected to maximize contextual contrast in terms of caseload, population density, and territorial reach. The Council of State is unique in that Belgium has only one Council, divided into two linguistically distinct divisions, allowing us to study both (Conseil d'État, 2021). For the commercial and police courts, selection criteria evolved progressively during fieldwork as we observed significant variations in their operational

challenges. Some courts, for instance, handled very high caseloads (Collège des cours et tribunaux, 2025b, 2025a) within relatively small yet densely populated regions — raising distinct administrative and technological hurdles — whereas others oversaw fewer cases but they spanned a broader geographical area (Service public fédéral Intérieur, 2025). Table 2 below summarizes core distinctions of the specific courts selected.

To preserve confidentiality, all selected courts have been pseudonymized and assigned the names Alpha, Beta, Gamma, Delta, and Epsilon. These designations do not reflect the order in which the case studies were conducted, nor do they imply any typology or hierarchical ranking. The Council of State is the only exception: as only one exists, it was not pseudonymized and is referred to by its official name.

Conducting seven case studies across three carefully chosen jurisdictions enabled us to achieve an effective balance between two core objectives: first, capturing distinct perspectives on judicial modernization and digital reforms through the analysis of specific digital tools; and second, accounting for important contextual characteristics — including linguistic regime, case volume, geographical extent, and population density — in order to develop a comprehensive understanding of the socio-material practices and broader changes across contrasting organizational settings.

Jurisdiction	**Council of State**[27]		**Commercial courts**			**Police courts**	
Type of litigation	Administrative		Civil and Commercial			Criminal and traffic-related civil	
Tool	*juriDict*		*RegSol*			*MaCH*	
Phase of judicial reform	A localized, modular and cooperative political strategy (2008-2014)		Market-driven and outsourcing strategy (2015-2020)			The Revolution: Centralized management and global digitalization efforts (1999-2007)	
Specific courts	French speaking part	Dutch speaking part	Alpha Court	Delta Court	Gamma Court	Beta Court	Epsilon Court
Linguistic regime	French	Dutch	French	French	Dutch	French	Dutch
Geographic area (km²)[28]	/	/	1104,31	11114	1000, 31	1488, 27	1 163,22
Population [29]	/	/	1912947	1831080	1084951	552619	527118
Population density within their jurisdiction (inh/ km²)	/	/	1732,25	164,75	1084,61	371,3	453,15
Number of closed files	±1.500[30]	±1200	±10500[31]	±5500	±111000[32]	±8000	±7000

Table 2. *Contextual data of the specific courts selected*

[27] The Council of State's data are based on its most recent available activity report, which dates back to 2020 (Conseil d'État, 2021).
[28] It consists of the combined geographic area of all municipalities within each judicial division (Service public fédéral Intérieur, 2025).
[29] It represents the total population in 2024 of all the municipalities included in each judicial division (Service public fédéral Intérieur, 2025).
[30] Final and intermediate rulings that were issued
[31] This figure represents the sum of the "OUTPUT" columns in the "business cases" and "insolvency files" tables, derived from the 2024 annual statistical data (Collège des cours et tribunaux, 2025a).
[32] This figure represents the combined total of civil and criminal cases, based on 2024 data (Collège des cours et tribunaux, 2025b).

1.2. Entering the field

Fieldwork opened with the French-speaking division of the Council of State: a former IT specialist who had programmed *JuriDict* served as a key informant (Albarello, 2012). Because of the health restrictions imposed during the Covid-19 pandemic, this case study was conducted entirely remotely via videoconference. This first case illuminated the development, design and maintenance phases of an internally designed database and generated our first set of propositions about how early design decisions translate into current practice. A second case study was carried out, on-site this time, on the Dutch division of the Council of State to test our design–maintenance propositions across linguistic lines.

Those propositions further guided the second wave of case-studies. We chose to examine the *RegSol* tool, which was being deployed in the commercial courts as the first electronic case file system in Belgium. Once again, a key informant — a judge at the Alpha Court — enabled our access to the field. In addition to conducting interviews with both internal and external actors of the court who used the tool, this case study provided the opportunity to interview "elites" (Musselin, 2004), those who played a central role in the design and development of the *RegSol* tool. The court's overwhelming caseload foregrounded the deployment challenges of a co-developed tool. To see whether workload and territory altered those challenges, we moved next to the Delta Court — which is also French-speaking but has a larger territory to cover, although not densely populated — and then to the Dutch-speaking Gamma court, where the Bar Associations facilitated access.[33] These three sites revealed how territorial span and external partnerships shaped the development and early use of *RegSol*.

Having examined an in-house-developed tool, used by a small user community (*juriDict* at the Council of State) and a co-developed one intended for a specific procedure and widely implemented across specific courts (*RegSol* in the commercial courts), we focused on a not yet explored configuration: *MaCH*, an externally developed case-management system intended for use across multiple courts handling different legal matters. All police courts have been using this

[33] The Gamma court is not directly mobilized in the empirical part of the thesis (Chapter 6, which focuses on *RegSol* in commercial courts). However, it contributed to the broader reflection developed throughout the doctoral work: some materials collected from this field, including interview excerpts, are drawn upon in the interpretive part (notably in the discussion) to shed light on transversal dynamics observed throughout the research.

tool since its inception. Looking at geographical areas that we did not investigate yet, we chose the Beta and Epsilon Courts. These two sites — large, dense, French-speaking Beta versus small, sparse, Dutch-speaking Epsilon — showed how the use phase of a nation-wide application is locally adapted and adopted by different professional groups.

This collective-case study approach was conducted iteratively, aligning with the evolving timeline and strategic refinement of our case selections. Table 3 offers a very general view of the data collection process. This iterative process enabled us to refine our analytical propositions progressively and apply emerging insights across subsequent cases, in line with abduction practice (Hlady-Rispal, 2015). Data collection, analysis, and interpretation thus advanced in successive iterations, and at the close of every iteration we drafted the article grounded in its findings. The three papers of this thesis therefore appeared sequentially, each anchored in distinct tool-jurisdiction pairs, life-cycle stages and analytical lenses, mirroring the research itinerary itself. Without explicit intentions to compare findings across jurisdictions or cases directly, this study instead considers linguistic regime, organizational scale, and territorial reach to illuminate the contextual nature of digital innovations in Belgium's justice system.

Studied Case	Data collection	Time frame
Council of State (French-speaking part)	11 semi-structured interviews	January 2021 – November 2021
Council of State (Dutch-speaking part)	4 semi-structured interviews	June 2022
Alpha Court	15 semi-structured interviews 4 observed situations	November 2021 – January 2022
Delta Court	12 semi-structured interviews 4 observed situations	January 2022 – March 2022
Gamma Court	6 semi-structured interviews 2 observed situations	May 2022 – June 2022
Beta Court and prosecutor's office	16 semi-structured interviews 6 observed situations	September 2022 – October 2022
Epsilon Court and prosecutor's office	8 semi-structured interviews 5 observed situations	November 2022 – December 2022

Table 3. *General overview of the data collected* [34]

[34] For a more detailed presentation of the data collection by case and category, see Appendix 2 and Appendix 3.

1.3. Introducing the three tool-jurisdiction pairs

We will briefly introduce each digital tool and the corresponding jurisdiction under examination. Each of the following articles centres on one tool-jurisdiction duo. We present the jurisdictions in the order we entered the field, not in the order the tools were created. Although chronological framing may not always be the most suitable approach to organizing empirical data (Czarniawska, 2003), it follows our research itinerary and shows how our analytical perspectives matured from one case to the next.

While our data-collection approach remained consistent across the case studies, the interpretive toolkit was tailored to each case's distinct demands. By the time we reached the final cases, we were working with a considerably more elaborate framework than at the outset. Presenting the cases in fieldwork sequence therefore makes visible the progressive sharpening of our analytical perspectives in parallel with our empirical inquiry and shows how the overall argument grew progressively richer.

1.3.1. *juriDict* at the Council of State

The Belgian Council of State has been operating since 1948, established by legislators to provide all natural and legal persons with a remedy against unlawful administrative acts that cause them harm (Conseil d'État, 2025b). It serves both consultative and judicial functions:

- Consultative Function: the Council issues opinions in legislative and regulatory matters.
- Judicial Function: it can suspend and annul administrative acts violating applicable legal rules. The Council of State also acts as a court of cassation for appeals against decisions by lower administrative courts.

The Council of State is composed of the Council, the Auditorat, the Coordination Office and the Registry (Lois Sur Le Conseil D'État, Coordonnées Le 12 Janvier 1973, 1973, Article 69).

Based on its assigned missions, the Council of State is divided into two sections: the Legislation Section and the Administrative Litigation Section. Each of these sections comprises both a Council (which issues rulings and opinions) and an Auditorat. In the Legislation Section, auditors' draft

reports on texts submitted for the Council's opinion. They participate in deliberations but have a consultative vote only. In the Administrative Litigation Section, auditors handle the investigation and instruction of cases, draft a report, and provide their opinion in public hearings. They ensure that all preliminary measures are carried out. The Auditorat is organized by language, mission, and type of litigation. Legal administrative attachés and documentalists assist the auditors. Specifically, legal attachés draft reports in collaboration with a designated magistrate within a particular section, each with its own domain of competence. The first article of this thesis focuses on the Auditorat of the Administrative Litigation Section and on its tool: *juriDict*. We investigated both the French-speaking part and the Dutch speaking part.

juriDict is an electronic repository containing rulings (arrêts) and non-admission orders of the Council of State. Since 2007, it has been freely accessible to the public via the Council of State's official website. By centralizing and organizing the Council's jurisprudence, *juriDict* plays a significant role in ensuring transparency and ease of reference and is thus integral to the Council's judicial function (Conseil d'État, 2025c).

1.3.2. *RegSol* at the Commercial Court

The Commercial Court is a specialized tribunal in Belgium responsible for resolving disputes between businesses and handling specific actions related to companies and insolvency matters. There are nine commercial courts across the country, each operating under a court of appeal's jurisdiction and potentially comprising one or more divisions (Cours et Tribunaux de Belgique, 2025a). Its jurisdiction can be further specified through three main areas of competence:

- General competences: the court hears commercial disputes of any monetary value, including those involving businesses and, in certain cases, private individuals taking legal action against a business.
- Specific competences: in addition to general commercial disputes, the court deals with particular legal conflicts such as those involving companies, associations, or foundations, intellectual property rights, market practices, and more.
- Exclusive competence in insolvency: notably, the court holds exclusive jurisdiction over actions and disputes directly tied to insolvency proceedings (bankruptcy or judicial reorganization). This competence is the domain of investigation in our thesis.

Each commercial court is divided into one or more chambers, each comprising a career judge and two consular judges. The consular judges — recruited from the business world (e.g., entrepreneurs, company directors, accountants, or auditors) — complement the career judge's legal expertise by bringing practical commercial experience to the bench. Every division of the commercial court maintains its own registry to handle local case files. Clerks support judges during hearings, prepare official records of proceedings, draft rulings, and ensures the procedure is followed correctly. A broader administrative team manages data entry, mail processing, and front-desk services. This collaborative structure is essential to the court's everyday functioning.

Among the various digital systems employed by commercial courts, *RegSol* stands out as the most developed. *RegSol* is an electronic database that records, stores, and exchanges case information tied to insolvency procedures, particularly bankruptcy and judicial reorganization (Avocats.be, 2018a). It centralizes data from all participants in an insolvency case (e.g., judges, clerks, receivers, and lawyers). *RegSol* is the focus of the second article, illustrating the interplay between digital innovation and the governance of insolvency proceedings.

1.3.3. *MaCH* in the Police Court

The Police Court, in Belgium, should not be confused with the police itself. There are 15 police courts across the country, each potentially split into several divisions (Cours et Tribunaux de Belgique, 2025b).

The Police Court exercises both criminal and civil jurisdiction:

- Criminal competence
    - Traffic offenses: the Police Court has authority over breaches of traffic laws, from hit-and-run incidents to unintentional bodily harm resulting from a road accident, as well as drunk-driving cases.
    - Claims for compensation following traffic or railway accidents: the Police Court exclusively deals with financial compensation for damage caused by road or rail accidents (the so-called "civil interests" in criminal matters).

    - Contraventions: these are lower-level infractions punishable by up to seven days of imprisonment, 20–45 hours of community service, or a fine ranging from €1 to €25 (plus surcharges). Examples include minor vandalism, minor assault, and disturbing the peace.

    - Infractions under special laws: these can involve railway incidents, public drunkenness, infractions under the 2018 law on railway policing, and more.

- Civil competence

    - The Police Court also handles road-accident-related litigation, determining liability, compensation, and any recourse actions by insurers.

    - It hears appeals against administrative sanctions — like communal fines, minor speeding penalties, or administrative measures taken under football-security laws.

Although the Police Court has both criminal and civil competences, this thesis focuses on the criminal aspect.

Each police court consists of criminal and civil chambers, each presided over by a single police-court judge, assisted by a clerk. During criminal hearings, a representative of the public prosecutor's office is present to bring charges in the name of society. This office is composed of the prosecutor, division prosecutors, first substitutes, and substitutes, all aiming to uphold the public interest in penal matters. Each police court has its own registry, headed by a chief clerk. Depending on the judicial district, one or more chief-of-service clerks may help supervise daily operations, along with clerks and administrative staff. These registry personnel ensure the smooth administrative functioning of the court: processing incoming and outgoing mail, overseeing the surrender of driving licenses after rulings, and recording appeals against judgments.

The *MaCH* application is the case-management system used mainly in criminal proceedings at police courts. Originally launched to manage data for district courts, police courts, and prosecutors' offices on a single centralized server, *MaCH* has expanded over time — benefiting from frequent updates and significant investment (Service public federal Justice, 2019). By 2019, it was operational in 58% of all Belgian judicial sites and used by around 53% of judicial staff,

containing over 116 million case files. In police courts, *MaCH* plays a critical role in digitalizing and coordinating criminal-case data, enabling judges, clerks, and prosecutors to streamline procedures and exchanges. As such, it forms a key focal point in the third article of this thesis, exemplifying how digital tools contribute to the evolution of criminal-justice practices in Belgium's police courts.

2. The data collection methods

Aligned with our research design, our means of generating empirical data were qualitative in nature. A defining feature of case study research, as highlighted by Yin (2009), is its reliance on a variety of data sources. Utilizing multiple sources and triangulating these data not only supports the findings but also enables a comprehensive and context-sensitive understanding of the investigated phenomenon. Consequently, we found the triangulation method (Dumez, 2016), to be particularly appropriate. This approach contributes significantly to the establishment of both validity and reliability in relation to the phenomenon being researched (Corbière & Larivière, 2020). It enables the examination of both the actors' narratives and their actual practices. Throughout the study, we employed three primary research methods concurrently: documentary analysis, interviews, and direct observation. Utilizing these approaches enabled us to compile a substantial dataset, encompassing political and managerial discourses, transcripts of interviews, notes from observations, and detailed accounts of participants' actions. The reliance on these varied data gathering techniques enriched our analysis by offering multiple perspectives and enabling the cross-verification of the collected data. The fieldwork took place between January 2021 and December 2022. Data gathering ceased when it entered the saturation phase, during which the analytical model reached a level of stability and became progressively less influenced by the emergence of new insights (Kaufmann, 2016).

2.1. Documentary analysis

Documentary analysis was among the initial techniques we utilized for data collection. Documents represent tangible records or evidence that embody objective information about a subject or system. These traces are not actively produced for the purpose of research but exist independently, often created by participants or elements within the system being studied. They can include records,

artifacts, and other forms of material evidence that provide insights into the behaviours, practices, processes, or conditions of the subject of study, allowing researchers to analyse and interpret them without the direct influence of the researcher's actions or intentions (Albarello, 2012). Throughout our fieldwork, documentary analysis was employed for various purposes. The initial materials analysed were legal texts, policy documents, technical manuals, minutes compiled by the FPS of Justice, blog posts, press interviews, and LinkedIn posts. These documents offered us a preliminary insight into the legislative, political, and organizational context of each case study. We were able to gather “the managerial” discourse regarding the modernization of justice and digitalization of courts. In addition to these formal sources, written materials produced by the court actors themselves were also used such as internal operational reports, court schedules, and tool usage guides. They enabled us to gain insight into the organization and content of the work performed by the actors, offering specific illumination on observed behaviours and the implementation of the tools. While at the beginning of the research, this grey literature facilitated our entry into the field, it also allowed an understanding of the logics of action and the organization of work throughout the research. A continuous back and forth between these documents, the material of interviews and observations, and the scientific literature took place in order to shed light on new elements, formulate new propositions and validate the analysis conducted.

2.2. Interviews

We quickly added interviews to complement our collection of documents. At the start of every case study, exploratory interviews were conducted with key informants who possessed insights and familiarity with the field within which we were venturing (Albarello, 2012; Beaud & Weber, 2010). The purpose of these interviews was to gather information about the field, identify potential propositions and insights for guiding our subsequent research efforts (Van Campenhoudt et al., 2017), serving primarily a heuristic role. Subsequently, we carried out more detailed "in-depth" interviews (Beaud & Weber, 2010) to capture "the actors' own perceptions, feelings, and attitudes towards every facet of their organizational life" (Friedberg, 1988, p. 106). These interviews are classified as semi-structured, meaning they are neither entirely open nor constrained by a large number of specific questions (Van Campenhoudt et al., 2017). Through these discussions, "the interlocutor is encouraged to present and explain their perception, thereby assessing their own circumstances, the challenges they face, the individuals they collaborate with to address these

challenges, and the nature of their relationships with these individuals" (Friedberg, 1988, p. 120). The target audience for these interviews can be put into three categories: (1) "elites" (Musselin, 2004) — policy makers, external experts and actors involved in the digitalization process — (2) court practitioners — magistrates, clerks, registry staff members — (3) network partners prosecutors, lawyers, curators and consular judges.

The interviews were “conducted on the basis of an interview guide made up of different “themes” (Albarello, 2012, p. 88).[35] This guide drew significant inspiration from Friedberg's model (1988). The framework was rigorously evaluated and modified as necessary to accommodate the distinct background of each informant, their organizational associations, or any alterations in our investigative approach. Initially, our interview guide was broadly exploratory, less structured, and primarily informational, as previously mentioned. Over time, we adopted a more structured and directive stance, in line with the progression of our research insights. A total of 76 interviews were carried out.[36] These interviews were conducted on a one-on-one basis between the interviewee and us. The majority took place at the informant's workplace, such as their office, a meeting room, or occasionally, an empty courtroom. A number of interviews were conducted remotely via Teams for two main reasons. Firstly, our research commenced in January 2021 amidst the second Covid-19 wave, preventing our access to the field for our initial case study at the Council of State. Secondly, the unavailability of certain actors for in-person meetings led us to opt for virtual interviews to ensure we could still engage with them. The length of the interviews ranged from 34 minutes to 3 hours and 30 minutes. There were conducted in French or Dutch, aligning with the informant's preferred language. All interviews were recorded, except for a few instances where recording was refused by an informant. Subsequently, they were transcribed, coded, and analysed. Finally, for the purposes of this thesis, they were translated into English and treated with confidentiality and anonymity. The interactions were structured as dialogues that blended narrative, informative, and argumentative elements (Blanchet & Gotman, 2015), varying with the themes explored, the inquiries posed, and the goals of the informants. Through these interviews, we were able to discern the formal and informal roles of the actors, their perceptions of their work, their use of tools, and how they experience the digitalization process.

[35] See Appendix 1 “Interview guides”
[36] See Appendix 2 “List of interviews by case study”

2.3. Direct observation

Alongside collecting documentary materials and conducting interviews, employing direct observation in situ (Beaud & Weber, 2010) served as an additional data gathering technique. It allows the researcher to become "the witness of individuals' behaviours and practices within groups by staying at the very places where they occur" (Martineau, 2005, p. 6). Distinct from interviews that might generate an artificial setting, this approach facilitates the study of individuals within their authentic, everyday contexts. Observation in situation, like any methodological tool, is influenced by the epistemological stance adopted by the researcher. Utilizing an action-centred conceptual framework and a relational ontology, the aim was to understand the social interactions that emerged among actors within socio-technical networks (Latour, 1990). Therefore, we focused specifically on how organizational forms are actually produced (Orlikowski, 2010, p. 137), and examined the ways and reasons that workers and technology coexist in various arrangements (Suchman, 2007). Throughout this research, we carried out a series of direct observations (n = 21),[37] focusing primarily on two types of situations: hearings and the work of clerks and registry staff members. These observation sessions could last from 2 to 5 hours.

Observation brings into focus the researcher's relationship to the situations they observe and, more broadly, their place on the field. Our role varied between "complete participant" and "complete observer" (Gold, 1958). The former implies that the researcher observes clandestinely, while the latter means that the researcher observes while being acknowledged as an observer but maintains a discreet presence and does not engage in any of the activities (Martineau, 2005, p. 9). The situations we observed primarily consisted of public hearings, indicating that we had the freedom, just like anyone else, to be present and observe without our observational role being known. In this context, we were a "complete participant." The other type of observed situations involves clerks and assistants at work. In this case, we were officially invited to the clerk’s office, making our observer status known to all participants. Field presence demands a significant capacity for focus as well as an ability to discern what is worth observing. To support the organization and preparation of our observations, we defined and used an observation grid. This guide included various details such as the location and date, along with the specific situation being observed, the actions taken,

[37] See Appendix 3 “Observation overview table”

actors engaged in the interaction, devices and tools employed, the participants' comments and statements, and any aspects that seemed surprising to us (Peretz, 2004).[38] The framework was adapted and refined throughout the research process. The observations were documented through field notes that were initially pragmatic and descriptive, capturing the essence of the observed situations. This included detailing what the subjects were doing, the nature of their interactions, unfolding events, the physical characteristics of the locations, etc. Subsequently, the notes became more theoretical, aiming to outline an interpretation of the phenomena observed (Martineau, 2005).

While direct observation was conducted, its scope remained more limited. The two primary methods used throughout this research were documentary analysis and semi-structured interviews. These methods proved particularly effective given both the constraints imposed by the COVID-19 pandemic, which limited opportunities for extensive field presence, and the analytical objective of confronting official political discourse with the actual practices observed in the field. Documentary sources offered valuable insights into the formalized ambitions, frameworks, and narratives surrounding digitalization, while interviews allowed us to access actors' situated interpretations, experiences, and strategies. Nonetheless, observation moments offered rich contextual information, especially when complemented by informal exchanges. We deliberately treated informal interactions — whether before and after interviews, during hearings, or over lunch at the Registry — as additional opportunities for gathering insights. These conversations, although unstructured, often shed light on everyday practices, work dynamics, and interpersonal relationships that might not surface in more formal interview settings.

2.4. Research ethics

This study involved direct interaction with individuals and sensitive institutional settings, requiring careful attention to ethical standards, data protection regulations, and academic integrity throughout the research process. All ethical and data-protection requirements were strictly observed. The study complies with the EU General Data Protection Regulation (GDPR)[39] and with the guidelines of the Ethics Committee of the University of Liège. Before each interview or observation session, participants received an information and consent sheet — a sample form is

[38] See Appendix 4 "Observation guides"
[39] https://gdpr-info.eu/

provided in Appendix 5 that specifies what kinds of data are collected, for what purposes, and under what conditions they will be stored, analysed, and reported. All recordings and transcripts were pseudonymized: each participant and site were assigned a code, and the correspondence table is encrypted and known only to the researcher himself. Digital files are kept on a password-protected work computer and on DoX,[40] the university's secure internal storage platform, both of which satisfy the GDPR standards for access control, back-up, and retention. No identifying details appear in the thesis or in the articles derived from it, and raw data will be destroyed after project completion. Furthermore, in accordance with the Charter of the University of Liège on the use of generative artificial intelligence in academic work (Université de Liège, 2023), AI tools (specifically OpenAI's ChatGPT-4) were used in full compliance with the ethical and pedagogical guidelines of the university. These tools were employed as linguistic assistants to improve the structure, clarity and phrasing of sections written by the author, to help translate certain passages, and to support the search for general and academic information. No content has been copied or inserted without critical review and rewriting, and all interpretations, analyses, and arguments remain the author's original work. This use of AI does not replace scientific reasoning or personal academic work, and the thesis respects both the University's ethical standards and the integrity of academic authorship.

3. The data analysis

Analysis refers to the process of assembling, examining, and interpreting the materials collected in order to address the research questions (Abbott, 2014, p. 169). This process was initiated at the start of data gathering and extended across the span of the research. The collection and analysis phases were conducted in an iterative manner, reciprocally shaping each other (Corbière & Larivière, 2020), facilitating essential interactions among the researcher, the data, and theoretical frameworks. For each set of observations and interview rounds within the seven investigated case studies, data transcription and subsequent analysis ensued. This process enabled an ongoing interrogation of the observed realities and a verification of preliminary findings, aligning with our abduction mode of inference. In this way, we blurred the traditional boundaries between data collection and analysis.

[40] https://dox.uliege.be

3.1. Thematic analysis and iterative coding

Given the substantial volume of information, we first assembled and organized our corpus (Miles & Huberman, 2003) through a thematic analysis. We chose a thematic analysis because its flexible pattern-seeking logic can handle heterogeneous qualitative documents, and it matches the back-and-forth rhythm of abductive inquiry (Braun & Clarke, 2006). From the outset, every text segment was coded along two axes: a descriptive label that captured its immediate unit of meaning and a lifecycle tag — design, development, maintenance, or day-to-day use — identifying the stage of the digital tool to which the excerpt referred. This dual tagging produced a provisional map of themes and sub-themes, yet without imposing any prior theoretical frame. This coding process aimed to extract information, relationships, and meanings from the data into a more analysable form by identifying overarching themes (Miles & Huberman, 2003). Interview transcripts and field notes were continuously read, compared, and contrasted with the literature, leading to the creation of other levels of themes and sub-themes. The iterative coding process was facilitated by using an analysis software named Corpus©.[41] Corpus is a free open-source software developed by the University of Liège. It enables thorough and detailed qualitative thematic analysis (Braun & Clarke, 2006) across various document types such as case law, interviews, and press articles. This capability is made possible by its sharing, labelling and multilevel tagging systems. This approach resulted in the description of each case on an individual basis and the drafting of initial thematic field reports. Subsequently, an in-case analysis (Yin, 2009) was performed to identify trends and recontextualize the phenomenon, thereby providing a detailed understanding of each case.

As this process progressed, two kinds of integration occurred: (a) overlapping codes were consolidated across interviews, documents, and field notes, and (b) those emergent patterns were aligned with relevant conceptual models. Accordingly, the results refined our research scope, paving the way for the development of potential future research questions, and gradually moving us beyond the descriptive stage and engaging in deeper analysis. Regular peer-debriefing sessions helped us re-evaluate and merge categories, ensuring both coding accuracy and analytic consistency. The blended method of descriptive and analytical examination allowed us to interpret the data through a dual lens: categorizing to make sense of descriptions and applying analytical

[41] https://corpus.lltl.be

models to construct our narrative systematically. This rigorous analytical process required us to return to our previously collected empirical data for more focused or detailed coding, alongside conducting new observations and interviews, and engaging in thorough literature reviews on more specific topics. Insights from one iteration shaped the questions and sampling strategy of the next, so that data collection, coding, and theorizing advanced in successive cycles. After finishing the fieldwork for each jurisdiction, we immediately drafted the article that reported its findings, allowing the three papers to appear one after another in step with the study's three main cycles.

3.2. Broadening the analytical framework

In Chapter 3, we outlined two foundational conceptual perspectives that guided this thesis: (1) a socio-technical perspective, inspired by STS, and an organizational perspective, grounded in the SOA. Together, they provide a relational, socio-material, action-centred lens to study how digital tools emerge, circulate, and become embedded in judicial work. As the research progressed, an iterative dialogue between these perspectives, the fieldwork, and scholarship in the sociology of justice (Delpeuch et al., 2014; Vigour et al., 2022) highlighted the need for a broader, multi-dimensional framework. Several studies conceptualize justice through three complementary angles: political, professional, and organizational. From this standpoint, justice can be understood as (1) a political institution subject to public action logics, (2) a professional arena structured by groups with their own interests and identities, and (3) a public organization traversed by procedural and managerial dynamics. Building on this triad and our empirical insights, we abductively elaborated two additional perspectives: a socio-political perspective and a professional perspective, while the organizational angle is already addressed by our organizational perspective. The two complementary angles maintain the same focus on action, relations, and situated configurations, while offering additional vantage points for analysing how public action is steered, how professional boundaries are negotiated, and how expertise is reconfigured through digital infrastructures. Although they broaden the empirical scope, they remain anchored in the relational, processual, and socio-materialist commitments of the original conceptual frameworks.

3.2.1. The socio-political perspective

The emergence of the socio-political perspective is an abductive deepening of the combined use of the socio-technical perspective and the organizational perspective. ANT invites us to follow the

controversies and translations through which socio-technical assemblages are stabilized (Latour, 2005), while SOA emphasizes the configurations, margins of manoeuvre, and interdependencies that shape action within organizational fields (Musselin, 2005). It is from this conceptual ground — focused on action, relations, and context — that the socio-political perspective takes shape. As the case studies unfolded, it became increasingly clear that our initial conceptual framework also sought to make visible the situated arrangements and shifting associations that compose public action through digital tools. The socio-political perspective emerged from this realization: it builds directly on the interactional and situated focus of ANT, SOA and socio-materiality, while making more explicit the ways in which digital infrastructures participate in reform strategies, modernization discourses, and the structuring of public action (Callon et al., 2001; Carmes & Andonova, 2012; Lascoumes & Le Galès, 2005). This perspective thus adds a crucial analytical layer. It allows us to examine how technological artefacts do not simply support or constrain practices, but also materialize political rationales, managerial ideologies, and institutional compromises (Carmes, 2008; Lascoumes & Simard, 2011). In doing so, it sheds light on the subtle yet powerful ways in which digital tools reconfigure steering of public action, and the boundaries of what counts as legitimate action in the judicial field. Rather than introducing a new theoretical framework, the socio-political perspective sharpens the political sensitivity already implicit in ANT and SOA — enabling us to analyse how policies are enacted not only in formal reforms and discourses but also in the very routines, choices, and infrastructures that shape justice on the ground.

To analyse these dynamics, this thesis thus adopts an organizational approach to the analysis of public action, firmly grounded in the sociology of public action (Callon et al., 2001; Halpern et al., 2014; Hood & Margetts, 2007; Lascoumes & Le Galès, 2005). This perspective focuses on the actors mobilized by reforms, the interactions among them, and the subsequent impact on organizational and professional practices (Musselin, 2005). In contrast to traditional public policy perspectives — centred on programmatic content, normative frameworks, coercive mechanisms, and social dynamics — this approach foregrounds the practical actions by which reforms are enacted. By prioritizing everyday routines, relationships, and negotiations, it captures how digital tools reveal underlying political and administrative dynamics (Carmes & Andonova, 2012). The fragmented nature of public action further reinforces this organizational focus (Sawicki, 2000). Empirical studies in this tradition often yield meso-level findings that are heavily context-specific,

shaped by the unique structures and interactions within particular sub-sectors. Thus, how *RegSol* is adapted in insolvency management may vary from how maintenance practices are structured for *juriDict*. By dissecting these local enactments, the thesis reveals that "politics" often emerges in interpersonal relationships and everyday procedures. The researcher's task is, therefore, to uncover the meanings of public action in real-world encounters — where the public meets the institution, and where local arrangements and service operations become visible (Musselin, 2005).

This socio-political perspective is particularly relevant when examining digital infrastructures in the justice sector. While the primary focus of this study is on innovations within specific courts and tribunals — rather than the overarching reforms that prompted their introduction — an understanding of the judicial sector's unique structures and arrangements remains essential. The analysis of digital infrastructures such as *juriDict*, *RegSol*, and *MaCH* must be situated within the broader context of modernization discourses and the political strategies that have shaped their development (Carmes & Andonova, 2012). By examining these infrastructures as instruments[42] used to structure public action, we see how professional practices are shaped by the interplay of top-down political rationales and bottom-up organizational routines. The socio-political perspective illuminates how broader political, economic, and managerial imperatives are inscribed in technological choices, influencing practices at the micro-level (Musselin, 2005). As a result, researchers can observe how these stakes appear in tangible procedures, protocols, and user practices, rather than in formal policy statements alone. The examined tools become crucial sites where every day routines reveal hidden power relations and socio-political considerations.

By shifting attention from formal discourse to situated use, this perspective enables a critical reading of infrastructures as both material and normative. It uncovers the political compromises, methodological choices, conflicting interests, and professional logics that these tools crystallize (Carmes, 2008). Therefore, it offers a dual perspective: a tangible entry point for empirical description and a critical lens for analysing the subtle processes through which steering of public action is exercised (Lascoumes & Le Galès, 2005). Herein lies the utility of a socio-political

[42] Instruments are defined in this thesis as socio-technical and sociological institutions (Hood, 2007) — that is, concrete devices that influence — and are mobilized by — actors to structure the production of expertise, guide professional practices, and organize public action to allow government policy to be made material and operational (Lascoumes & Le Gales, 2007; Lascoumes & Le Galès, 2005; Lascoumes & Simard, 2011). Instruments embody specific forms of knowledge about social control and ways of exercising it.

perspective: it illuminates how modernization processes are realized and contested in concrete settings, linking the design, deployment, and ongoing adaptation of digital tools to broader strategies for structuring public action. This approach resists overly formal or normative interpretations of reform by grounding political analysis in material practices and situated interactions. Overall, approaching digital infrastructures through a socio-political lens reveals their capacity to reconfigure relationships, embed policy objectives, and reshape practices (Musselin, 2004, 2005).

3.2.2. The professional perspective

Parallel to the socio-political angle, we adopted a professional perspective. Again, this perspective emerged abductively from the combined application of the socio-technical perspective and the organizational perspective. It is within this analytical space — focused on action, mediation, and context — that questions about professional expertise became analytically salient. As we followed the practices and associations emerging around digital tools such as *juriDict*, *RegSol*, and *MaCH*, we observed not only how these innovations reorganize work but also how they contribute to redefining what counts as professional knowledge and who is authorized to mobilize it. This led us to articulate a fourth perspective that sharpens our understanding on the shifting boundaries of expertise within the judicial sector, building on the premise that digital tools are mediators that reshape daily practices rather than static instruments passively applied (Latour, 2005; Nonjon & Marrel, 2015; Timmermans & Berg, 2003). In doing so, we challenge the conventional view of professions as self-contained entities founded on exclusive knowledge and formal mandates (Freidson, 2017; Larson, 1979). Instead, our analysis highlights professional groups (Abbott, 1988; Demazière & Gadéa, 2009): open, continuously evolving occupational clusters that negotiate roles, tasks, and competencies through interactions with both human and non-human actors.

From this perspective, expertise is neither a fixed asset conferred upon individuals, nor a stable jurisdiction rigidly defended by credentialed elites. Rather, it is a networked, performative accomplishment (Elmholdt & Elmholdt, 2017; Eyal, 2012) emerging from the interplay of social, technical, and organizational elements (Nicolini, 2009; Orlikowski, 1992). Far from treating expertise as a static set of practices, we focus on how it is (re)configured through interpretive processes — concrete negotiations, boundary work, and day-to-day sense-making (Sacco et al.,

2019). Since digital infrastructures introduce new functionalities and constraints, they act as mediators capable of challenging long-established hierarchies or reinforcing them, depending on how actors appropriate these technologies (Petrakaki et al., 2012). This agential view of technology contends that digital systems "translate" or transform professional norms in ways that may erode certain expert domains while enhancing others — what some scholars describe as "hybrid" professionalism (Evetts, 2011; Noordegraaf, 2007). Instead of casting these shifts as strictly deprofessionalization (Frey & Osborne, 2017; Susskind & Susskind, 2022) or reprofessionalization (Freidson, 2017; Timmermans & Berg, 2003), we see reconfiguration as a continuum of possible outcomes (Demazière et al., 2013; Nonjon & Marrel, 2015; Pareliussen et al., 2022; Timmermans & Berg, 2003), where new professional groups can gain legitimacy while established ones may adapt or fragment under external pressures, including organizational, managerial and digital logics and reforms (Anteby et al., 2016; Paradeise, 2010).

By emphasizing boundary work (Gieryn, 1983; Langley et al., 2019), we illustrate how professional groups collaboratively or competitively delineate their scope of authority, often propelled by digital innovation (Nonjon & Marrel, 2015). On the one hand, new tools can consolidate specific capabilities, fostering alliances that anchor novel areas of expertise; on the other, they can fuel contestation over whose knowledge "counts." Thus, focusing on professional groups rather than monolithic professions allows for the study of fluid, practice-based boundaries (Demazière & Gadéa, 2009). Through this analytical lens, the reconfiguration of expertise becomes visible in the everyday negotiations that integrate technology with human agency, resulting in multiple and context-specific forms of hybrid professionalism (Sacco et al., 2019). In sum, this perspective weaves digital infrastructures, organizational routines, and professional practices into a coherent framework for analysing how judicial actors and non-human actants collectively shape evolving forms of expertise (Pareliussen et al., 2022), as an ongoing, relational process (Eyal, 2012).

3.2.3. Integrating four perspectives for a comprehensive analysis

Together, the socio-technical, organizational, socio-political, and professional perspectives constitute a multi-dimensional analytical framework that enabled us to trace the reciprocal relationship between digital infrastructures, reform processes, and actors. This dual emphasis on

the iterative lifecycle of technology (development, design, maintenance, and usage) and on organizational-political-professional transformations provided a robust platform for uncovering how courts adapt to, repurpose, or resist digital innovations and inversely. The iterative four-step approach gives us a processual structure, while the four perspectives give us analytical depth. This integrated approach sets the stage for the empirical articles that follow. In practice, each case study will emphasize different combinations of stages and perspectives, but collectively, they illustrate how digital tools take shape in socio-political negotiations, weave into organizational practices, and prompt reconfiguration of professional expertise. By shifting the spotlight to specific stages or perspectives in each case, this thesis pieces together a holistic view of changes occurring in the justice system. In other words, the digital tool under examination serves both as an empirical entry point and as a material crystallization of transformations, thereby facilitating a more nuanced understanding of the overall dynamics at play.

PART THREE — THE EVERYDAY LIFE OF DIGITAL INFRASTRUCTURES

CHAPTER 5 — GRASPING THE SOCIO-MATERIALITY OF ADMINISTRATIVE LAW: *JURIDICT* AND THE LEGAL-TECHNICAL INFRASTRUCTURE OF THE BELGIAN COUNCIL OF STATE

Status: Published in *Revue interdisciplinaire d'études juridiques* in 2022[43]

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Abstract: For more than 15 years, the Belgian Council of State has been publishing its judgments and non-admission orders online. Browsing and searching the Auditorate case law databases is made possible via the *juriDict* application (Conseil d'État, 2025c). This free and open application has become an indispensable tool in administrative law. Considering *juriDict* as a "socio-material assemblage" (Suchman, 2007), this article aims to describe the development, design, maintenance, and use of this tool that allows the making of law, i.e., its reading, writing, and dissemination. Based on a grounded and comprehensive research, the authors first grasp the arrangements of human and non-human actors — citizens, lawyers, computer scientists, documentalists, languages, codes, points of law, means, scripts, screens, computer mice, algorithms, etc. — that make up the legal-technical infrastructure of the administrative jurisdiction. The analysis then reports on the redefinition of the practices, knowledge, and interactions that allow the law to exist. Finally, this contribution underlines some of the socio-technical conditions that guarantee the independence of the rule of law in a policy of open access to justice and law.

Keywords: socio-materiality, legal-technical infrastructure, rule of law, open source, Belgian Council of State

[43] This article was originally published in French and has been translated into English for the purposes of this manuscript: Dubois, C., & Pelssers, L. (2022). Saisir la socio-matérialité du droit administratif : juriDict et l'infrastructure juridico-technique du Conseil d'État belge. *Revue Interdisciplinaire d'Études Juridiques, 88* (1), 5-28. doi:10.3917/riej.088.0005

1. Introduction

Since 1790, justice in Belgium and France has been characterized by principles of openness, publicity, and publication (Lois Des 16 et 24 Août 1790 Sur l'organisation Judiciare, 1790).[44] Civil and criminal hearings are open to the public, criminal judgments are orally pronounced, citizens have the right to obtain a paper or digital copy of a judgment, and legislative texts (laws, decrees, orders, treaties, nominations, and rulings) have been published daily in digital format on the Belgian Official Gazette since 2003. The publicity and publication of judicial decisions guarantee fairness, independence, and impartiality of justice, as stipulated in Article 6-1 of the European Convention on Human Rights (ECHR).[45] While Jeremy Bentham already considered publicity as "the soul of justice" (Cléro, 2006, p. 103), it is crucial to distinguish it from publication.

The publicity of judgments and rulings concerns their oral pronouncement during the hearing by the judge. Until its revision on April 22, 2019, Article 149 of the Belgian Constitution stipulated that every judgment "is pronounced in a public hearing." This recent revision maintains the principle but adapts the means of implementation (Behrendt & Jousten, 2020). Acknowledging that reading an entire judgment aloud is cumbersome (Hubin, 2019), the legislature now specifies that every judgment must be "made public according to the modalities set by law. In criminal matters, its dispositive is pronounced in a public session (Révision Du 22 Avril 2019 de l'article 149 de La Constitution En Ce Qui Concerne La Publicité Des Jugements et Des Arrêts, 2019). The publication of judicial decisions refers to the dissemination of the written text prepared by the judge. Every citizen has the right to request a copy. However, in recent years, the concrete means of obtaining such copies have evolved:

> "Imagine you went to court fifty years ago to obtain a paper copy from a court clerk in a case of child abuse. Your purpose was to learn more about the case law on the subject. At that time, a human physically took a court decision from a record, copied it, and handed it over. Imagine now you go to court today with the same question and the same purpose. Chances are you will instead e-mail the court or visit its website and fill in your request.

[44] "In all civil or criminal matters, pleadings, reports, and judgments shall be public."
[45] This article specifies that "everyone is entitled to a fair and public hearing within a reasonable time by an independent and impartial tribunal (...). The judgment must be delivered publicly." Article 10 of the Universal Declaration of Human Rights also defines the right to a public trial.

> Most probably you will obtain an electronic form of a decision, e.g. a PDF" (Vanderstichele, 2021).

Recognizing these developments, the legislature has structured the digital publication of judicial decisions, requiring each judgment to be recorded in a centralized database (Loi Du 5 Mai 2019 Modifiant Le Code d'instruction Criminelle et Le Code Judiciaire En Ce Qui Concerne La Publication Des Jugements et Des Arrêts., 2023). However, the wait for details regarding this database (what digital infrastructure will be used?) and the modalities of personal data protection (what principles and anonymization procedures will be followed?) justified postponing the law's enforcement from May 5, 2019, to September 1, 2021, and subsequently to September 1, 2022 (Loi Du 5 Mai 2019 Modifiant Le Code d'instruction Criminelle et Le Code Judiciaire En Ce Qui Concerne La Publication Des Jugements et Des Arrêts., 2023, Article 9). Defining this juridico-technical framework is a crucial political issue for the independence of the rule of law (Vanderstichele, 2021) and a theoretical issue concerning the socio-materiality of law.

To illuminate these political and theoretical stakes, we propose to study a concrete case: that of the Belgian Council of State and, more specifically, the *juriDict* application. Since 2007, this application has enabled navigation and searches within the jurisprudential databases of the Council of State's Auditorate via its website (Conseil d'État, 2025c). Free and open, *juriDict* has become a fundamental tool in administrative law as it provides systematic access to rulings in French (since July 17, 1996) and Dutch (since January 1, 2000). The structure of *juriDict* results from a thorough analysis of rulings by specialized jurists, whose practices consist of reading, breaking down, selecting, and classifying these rulings.[46] By defining various keywords "in the form of domains related to the same subjects" (Joassart, 2008, p. 291), they organize and structure the database granting access to case law.

Beyond anticipating the revision of Article 149 of the Constitution, analysing *juriDict* allows us to grasp the socio-material conditions of jurisprudence publication and, through them, the conditions of existence of administrative law as it is read, disseminated, written, and constructed

[46] We estimate that, between 1996 and 2020, this analytical work was carried out on nearly 80,000 final judgments. This estimate is based on an analysis of the activity reports available online. Source: http://www.raadvst-consetat.be/?page=about_annualreports&lang=fr

(Latour, 2002).

Let us briefly examine this theoretical issue, which may not be evident to some educators and legal theorists — particularly in administrative law. Indeed, authors of administrative law textbooks generally pay little attention to the materiality of their subject. For example, in a well-known administrative litigation manual (Pâques, 2017), barely twenty lines out of 580 pages are dedicated to this topic. These lines succinctly state that the Council of State's search engine — whose name, *juriDict*, is not even deemed worth mentioning — "enables targeted investigations in the full text of all rulings" (Pâques, 2017, pp. 387–388) and also note that the generalized anonymization of published rulings is debated.[47] However, taking into account the socio-materiality of administrative law is a concrete issue for clerks, legal assistants, documentalists, IT specialists, and lawyers who experience it daily.

Considering *juriDict* as a "socio-material assemblage" (Suchman, 2007), this article aims to describe the development, design, and use of *juriDict* by examining the data and algorithms that comprise the application, both in what they are and what they do (Cardon, 2012, p. 138). Assuming that social and material dynamics mutually constitute each other, we will seek to clarify the concrete modalities of this entanglement. To do so, we will centre our analysis on the practices and objects that shape, legitimize, materialize, and render *juriDict* irreversible. The works of Bruno Latour (2002, 2005) will guide our perspective, as they finely depict the multiple actors, hallways, shelves, libraries, pens, printers, legal instruments, codes, and legal and administrative documents involved in the making of law. Building on this ethnographic approach, we will describe the databases, search tools, keywords, legal points, scripts, algorithms, programming languages, screens, IT specialists, documentalists, jurists, and even the mice that weave together the techno-legal infrastructure of the Council of State. Our focus will be particularly on the role of algorithms within this infrastructure, specifically their design (Schmitt, 2016), primarily, because only human actors are capable of defining formal procedures that can be replayed automatically under certain conditions. Algorithms consist of explicit and unambiguous sequences of instructions that guide a computer toward solving a predefined problem in a conditional manner. The "IF… THEN…" rule

[47] It should be noted that, on this point, the author expresses opposition to anonymization**, "**both because judicial decisions are public, which implies the publication of the decision of anyone resorting to the public justice service, and for the purely practical, yet very important reason that jurisprudence memory is largely linked to the names of the parties involved, particularly the applicant. Neglecting this aspect of the issue without thorough examination would be imprudent." (Pâques, 2017, p. 388).

is its ideal-typical instruction, where "IF" represents the condition and "THEN" the logical consequence (Dubois & Schoenaers, 2019; Hildebrandt, 2018). Such instructions can automate real-time analysis of images captured by airport surveillance systems (Neyland & Möllers, 2018) or organize storage and collection tasks in Amazon warehouses (Danaher, 2016). In both cases, algorithms are central to the socio-material infrastructures of stations, airports, and warehouses, where they connect cameras, passenger baggage, alerts, shelves, items, orders, and developers. Analysing the design, development, and implementation of these algorithms allows us to relativize their so-called autonomy and to highlight the numerous contingent, negotiated, and normative choices that make them exist. Human agency thus appears at the heart of the digitalization processes of airport surveillance tools, Amazon's supply chain, and … the making of law — through various practices of writing, disseminating, reading, researching, and analysing**.**

Accounting for this human agency is crucial at a time when forward-looking discourses, marked by technological determinism, herald a predictive (Katz et al., 2017; Queudot & Meurs, 2018)**,** disintermediated (Maharg, 2016) robotic (Branden, 2019), and dematerialized justice (Fersini et al., 2013; Sommer & Azoula, 2013). Like some colleagues attentive to the socio-materiality of digital libraries (Abbott, 2014; Latour, 2011) and accounting inscriptions (Puyou & Quattrone, 2020), we aim to describe the organizational processes and socio-material practices that enable professionals to work and citizens to access administrative law. In doing so, we will seek to understand how various human and non-human entities, including algorithms, concretely contribute to redefining the practices, knowledge, and interactions of actors involved in the making of administrative law (Latour, 2002).

From this socio-material perspective, we will avoid both techno-centric (Barley, 1988; Kling, 1991) and human-centric (Berg, 1997; Button, 1993) viewpoints to account for the multiple decisions and deliberations that shape the development, design, feeding, structuring, and use of a database and an application like *juriDict*. We also rely on an empirically grounded, comprehensive research approach. The study is primarily based on a dozen in-depth, confidential, and anonymous individual interviews conducted between January and July 2021 with people directly involved in this subject. Two exploratory interviews were conducted with researchers possessing general expertise on the topic; six semi-structured interviews were conducted with actors from the Council of State particularly involved in its digitalization processes; and four semi-structured interviews

were conducted with lawyers specialized in administrative matters. Additionally, we analysed various documents, including the Council of State's website, parliamentary reports, legal sources (laws and ministerial orders), ministerial correspondence, and the Council of State's activity reports.

We will present the development, design, and maintenance phases of the *juriDict* application by describing the actors (individual or groups), software, programming languages, data, keywords, legal points, and algorithms involved in these processes. We will also analyse some of the key challenges of these phases while highlighting one particular actor: Mr. B, an IT specialist and lawyer, bilingual in French and Dutch, who played a central role throughout this process. His translational work (Callon, 1986) — between law and computing, between French and Dutch, and *vice versa* — will shed light on how various allies (two documentalists, the chief auditors, and several legal assistants) were engaged and enrolled in this process, where human and non-human actors intertwine to shape a socio-material device that continues to mobilize an ever-growing number of allies, whose work both shapes and is shaped by *juriDict*.

2. Developing an interessement device

The development of *juriDict* is part of the digitalization process of the Council of State and aims to make two internal databases publicly accessible. The history of this process is incremental and began in 1996 with the creation of the first internal database — called *Bucobu* — which compiled available legislation. A few years later, this internal application facilitated public access to legislation through a new web interface called *RefLex*. In 2002-2003, two parallel databases were created: *Jurisprudence* and *Audidoc*. The former compiles legal points extracted from French-language rulings, while the latter does the same for Dutch-language rulings. These "legal points" are "a summary of one of the key teachings from a ruling or order of the Council of State" (Joassart, 2008, p. 291).

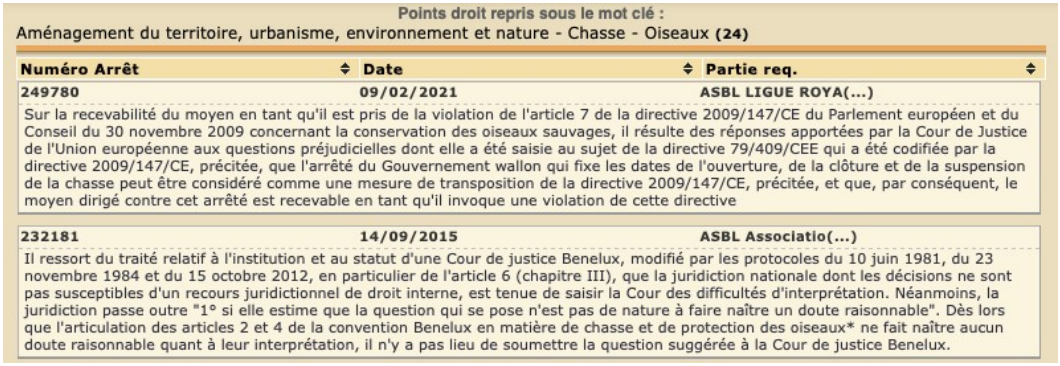
The *FileMaker*[48] software serves as the primary foundation for the Council of State's databases. As a documentalist from that period explains, this software enabled the team to develop databases without requiring specialized technical skills or external consultants. Consequently, *juriDict* was

[48] Cross-platform relational database application developed by Claris International, a subsidiary of Apple Inc.

progressively designed as a tool that could meet an emerging need by leveraging available resources such as databases, keywords, and internal expertise.

2.1. Available internal databases and structuring keywords

Let us return to *Audidoc* and *Jurisprudence*, the internal databases of the Dutch-speaking and French-speaking auditorates, respectively. While their hierarchical structure facilitates organized navigation, this arrangement is not innate. Rather, it stems from a meticulous process involving the reading, breakdown, selection, and classification of rulings, with legal assistants from the Auditorate assigning the most suitable keywords to each of them. Keywords related to the same subject matter are grouped into domains. Within each domain, users can navigate from the most general to the most specific keyword to retrieve a set of "legal points." For instance, in the domain "Territorial Planning, Urbanism, Environment, and Nature," subdomains include "Air," "Forests and Woods," "Noise," "Camping," "Hunting," etc. Under the "Hunting" subdomain, there are 24 legal points related to the keyword "birds." Each legal point refers to a specific ruling, whose outline can be accessed, as illustrated in the following screenshot (Conseil d'État, 2025a), displaying the first two referenced rulings:[49]


Points droit repris sous le mot clé :
Aménagement du territoire, urbanisme, environnement et nature - Chasse - Oiseaux (24)

Numéro Arrêt	Date	Partie req.
249780	09/02/2021	ASBL LIGUE ROYA(...)
Sur la recevabilité du moyen en tant qu'il est pris de la violation de l'article 7 de la directive 2009/147/CE du Parlement européen et du Conseil du 30 novembre 2009 concernant la conservation des oiseaux sauvages, il résulte des réponses apportées par la Cour de Justice de l'Union européenne aux questions préjudicielles dont elle a été saisie au sujet de la directive 79/409/CEE qui a été codifiée par la directive 2009/147/CE, précitée, que l'arrêté du Gouvernement wallon qui fixe les dates de l'ouverture, de la clôture et de la suspension de la chasse peut être considéré comme une mesure de transposition de la directive 2009/147/CE, précitée, et que, par conséquent, le moyen dirigé contre cet arrêté est recevable en tant qu'il invoque une violation de cette directive		
232181	14/09/2015	ASBL Associatio(...)
Il ressort du traité relatif à l'institution et au statut d'une Cour de justice Benelux, modifié par les protocoles du 10 juin 1981, du 23 novembre 1984 et du 15 octobre 2012, en particulier de l'article 6 (chapitre III), que la juridiction nationale dont les décisions ne sont pas susceptibles d'un recours juridictionnel de droit interne, est tenue de saisir la Cour des difficultés d'interprétation. Néanmoins, la juridiction passe outre "1° si elle estime que la question qui se pose n'est pas de nature à faire naître un doute raisonnable". Dès lors que l'articulation des articles 2 et 4 de la convention Benelux en matière de chasse et de protection des oiseaux* ne fait naître aucun doute raisonnable quant à leur interprétation, il n'y a pas lieu de soumettre la question suggérée à la Cour de justice Benelux.		

***Figure** 7. Illustration of two rulings containing legal points related to the keyword "birds"*

[49] The interface text appears in the original French. An English (unofficial) translation is provided by the author: The rulings concern the admissibility of claims alleging breaches of EU directives on the conservation of wild birds. The first decision (No 249780, 9 Feb 2021) holds that a Walloon Government decree setting hunting dates can constitute a transposition of Directive 2009/147/EC (the Birds Directive). The second decision (No 232181, 14 Sep 2015) concludes that there is no need to refer a question to the Benelux Court, as there is no reasonable doubt about the interpretation of Articles 2 and 4 of the Benelux Convention on bird protection.

Audidoc and *Jurisprudence* have evolved — and continue to evolve — separately. Designed by different departments that do not communicate with each other, they rely on different languages (Dutch for the former, French for the latter), concepts, and data. This duality arises from the existence of two distinct Auditorates within the Council of State, one French-speaking and the other Dutch-speaking. Without a common policy regarding the management of these internal databases, each Auditorate has independently organized its own data according to its own logic. As a result, *Audidoc* contains between 5,000 and 6,000 keywords, whereas *Jurisprudence* has between 17,000 and 18,000.

From their inception, these internal databases quickly became widely used, leading some chief auditors to envision making the jurisprudence accessible to the public, online, and free of charge after a few years. Such broad, rapid, and systematic dissemination of decisions was already stipulated by the Royal Decree of July 7, 1997, regarding the publication of rulings of the Council of State.

> "This objective is fundamental, as it effectively enables the public — that is, litigants — to access the case law of the Council of State: it is no coincidence that this is a right guaranteed by the Constitution" (Arrêté Royal Du 7 Juillet 1997 Relatif à La Publication Des Arrêts et Des Ordonnances de Non-Admission Du Conseil d'Etat, 1997).

The Auditorate members are tasked with managing, preserving, and providing access to documentation on the jurisprudence and opinions of the Council of State in the form of automated files. In this context, the initiative to make these two databases publicly accessible emerged in 2007, aiming to grant citizens access to the Council of State's rulings and orders of inadmissibility.

In the same year, Mr. B joined the Council of State to support its digitalization efforts. A Dutch-speaking IT specialist with a legal background and proficiency in French, he was soon introduced by the Auditorate to the project of making the two internal jurisprudence databases publicly and freely accessible. After discussions with the chief auditors, a consensus was reached: to preserve the perception of uniformity within the jurisdiction and enhance user navigation, the distinctions between *Jurisprudence* and *Audidoc* would remain hidden from public view.

The problematization (Callon, 1986) gradually took shape, initially centred around a key question: how to develop an intuitive application that enables navigation and searches across both internal databases through a single interface structured — like the internal repositories — by a keyword-based hierarchy? This tool, later named *juriDict*, was developed within a year and made freely available on the Council of State's website in March 2008.

This problem statement prompted Mr. B to conduct a preliminary analysis of the two internal Auditorate databases, exposing their structural differences. He identified two essential tasks. First, *Jurisprudence* and *Audidoc* needed restructuring to harmonize data formats, allowing seamless integration into a single interface, as desired by the Auditorate. Second, clear criteria for the inclusion and exclusion of publicly accessible data had to be defined. Since certain internal data was not intended for public dissemination, two dedicated databases were created to store only the information that met these criteria. Rulings were excluded if they lacked a legal point, did not require a decision, pertained to specific cases, or merely reiterated previous rulings. Regular meetings — both past and ongoing — were organized to ensure consistency in the selection criteria, aiming to maintain a balance between diversity and clarity in the database.

The issue of data asymmetry and these two core requirements shaped a progressively refined research problem, engaging two groups of actors connected by Mr. B: which decisions should be made public, and how should they be structured? Collaborating with two documentalists — one French-speaking and the other Dutch-speaking — responsible for *Jurisprudence* and *Audidoc*, he worked to align the disparate keyword structures. In parallel, discussions with auditors helped define both the nature and format of the jurisprudence to be published. This problem-solving process brought together multiple actors, including documentalists, chief auditors, and Mr. B himself. His bilingualism (French-Dutch) and dual expertise in law and software development placed him at the centre of designing the interessement device (inter esse, as highlighted by Callon (1986)).

After several months of work, with the restructuring and selection criteria in place, the next phase focused on designing the technical infrastructure for data publication. In this stage, too, Mr. B played a pivotal role as a mediator, ensuring that the data was presented in a clear and structured format through a technically robust and user-friendly tool for those responsible for maintaining it.

Granted considerable autonomy in his development and design work, he had to balance two key constraints: first, the interface needed to be appealing enough to encourage adoption by users; second, the database updating process had to remain straightforward for legal assistants managing its content. With these guiding principles in place, the technical development of *juriDict* began.

3. Technical design of *juriDict*

How can information be made clear and structured while ensuring a stable and sustainable tool over time? This was the question Mr. B was tasked with answering. To determine the most suitable technical solutions, he explored various options, including the use of open-source versus proprietary software and the selection of either simple programming languages or script-based languages. Ultimately, he opted for a modular architecture built on open-source technologies, arguing that this approach would provide greater flexibility in implementation, improved performance, and enhanced long-term viability. Furthermore, he was committed to ensuring that his technical choices did not undermine the "rule of law," which requires the independence of the judiciary:

> "For me, it is imperative that the Council of State remains independent of any private entity, whether software providers, legal publishers, or IT solution suppliers." (Mr. B, former IT specialist)

For this reason, Mr. B undertook the technical design of *juriDict* by leveraging open-source tools and communities.

These resources form the foundation of *juriDict's* architecture, which consists of three main components: the dual *Audidoc-Jurisprudence* database, a back-end part — described in the following sections — and the user interface. Figure 8[50] illustrates this modular architecture and the technical design of *juriDict*. A combination of simple programming languages and script-based

[50] The diagram illustrates the data flow and architecture underpinning the *juriDict* application, tracing the transformation of raw legal content into user-facing information. Two main data sources—*Jurisprudence* and *Audidoc*—are first exported from *FileMaker* databases using *ODBC* configurations. These data are then copied into *MySQL* databases and undergo a process of cleaning and restructuring to conform to a uniform schema. An intermediate database serves as a staging area, where data are verified before being validated and imported into the production database. This database feeds the back-end, which relies on *PHP* and *JavaScript* to dynamically generate the user interface. On the interface side, the diagram distinguishes between "Processing" (back-end logic and rendering) and "Graphique" (visual layout). The output is rendered in *HTML* and styled with *CSS* to support two types of user interaction: query/search and displayed results.

languages, all open-source, was used. It is worth noting that a programming language is a notation convention build for formulating algorithms and creating software programs that implement them (Lévy, 2010), while a script is a simple and loosely structured sequence of commands that automates successive tasks in a predetermined order (Mauny, 2016). As outlined in the next two sections, these languages and scripts help formalize the algorithms responsible for automating data import (3.1) and facilitating its publication through needs-oriented interface (3.2).

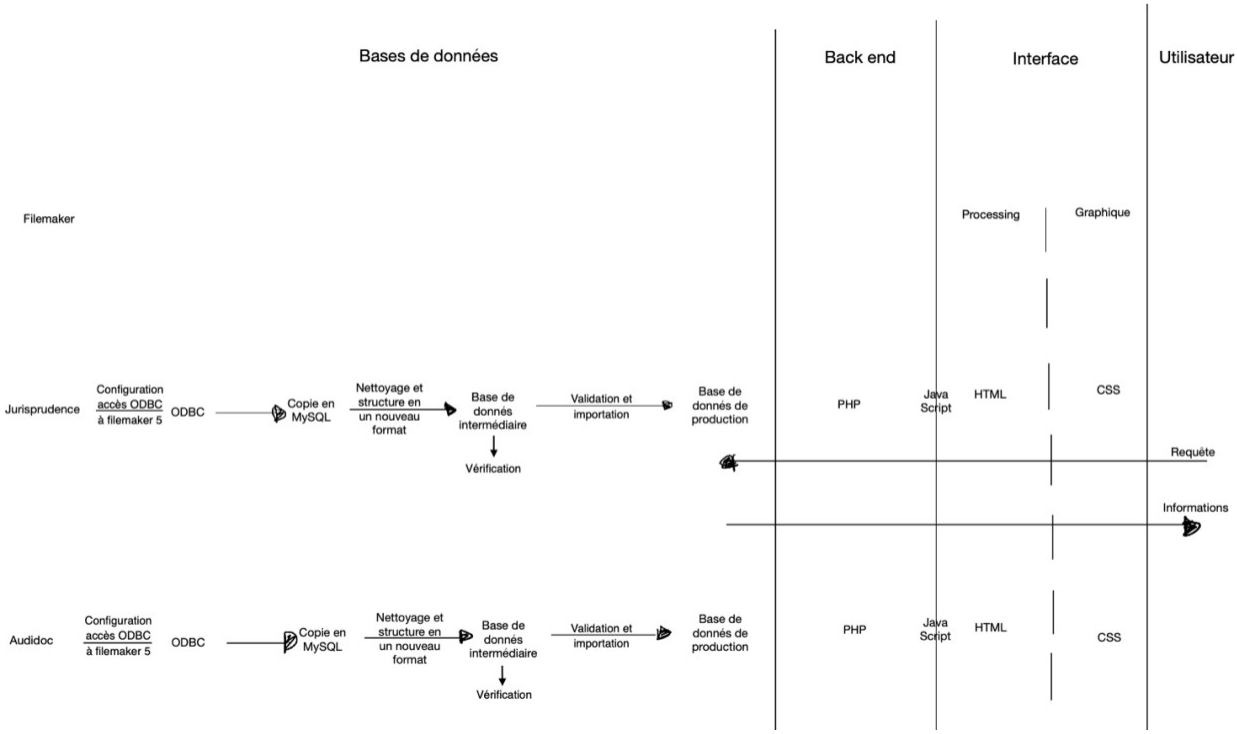


***Figure 8**. Schematic representation of juriDict's technical design*

3.1. Data extraction, cleaning, and importation

As previously mentioned, *juriDict* is built upon pre-existing internal databases, *Audidoc* and *Jurisprudence*, which have been restructured to facilitate the selection and importation of data for public access. While the two databases remain distinct, they are now accessible from a single interface and housed on the same server.

Early in the design process, Mr. B identified a significant technical limitation in the FileMaker 5 software, which he deemed inefficient for data extraction. To address this challenge, he developed several algorithms to create intermediary steps of data duplication, transfer, and verification. This

approach facilitated a smoother and more stable importation process through an automated script that runs nightly and systematically extracts and integrates data into *juriDict*. One of the principal advantages of algorithmic solutions is their capacity to operationalize existing knowledge to address specific challenges, thereby enabling the creation of automated resolution systems (Bachimont, 1996). In the case of *juriDict*, this process was structured into three key phases.

The first phase entailed extracting data from the *FileMaker 5* database and transferring it to an intermediary *MySQL*[51] database while maintaining the original data structure. This intermediary database served as a repository for managing and selecting data intended for public dissemination. To automate this process, Mr. B developed an algorithm that simulates human-computer interactions by imitating mouse clicks to initiate the data export from *FileMaker* to *MySQL*. Consequently, this approach required a dedicated physical setup, including a computer, monitor, and mouse, to autonomously execute the extraction process each night. The algorithm activated the *ODBC*[52] link, triggering data extraction and transfer. Instead of a direct script-based extraction, the automation relied on mimicking human actions.

The second phase focused on cleaning and reformatting the extracted data before its importation into another temporary *MySQL* database. While the *FileMaker* interface was designed with multiple screens and navigational buttons (e.g., back, search, homepage), the *MySQL* interface consolidated information into a single screen organized into multiple columns. This graphical restructuring helps organize legal points by making access pathways to information more visible. Additionally, navigational links facilitate browsing through the database hierarchy (Joassart, 2008). Mr. B progressively implemented these development choices through iterative discussions with documentalists and chief auditors involved in the project:

> "Through ongoing dialogue with them, I was able to grasp their professional logic — what types of data existed, which needed to be published, and how they were structured. We agreed on various elements, such as: 'This column contains internal data, so it should not be imported; it must remain internal.' Or: 'This is external data and should be made publicly

[51] My Structured Query Language: Open-source relational database management system
[52] Open Database Connectivity: Standard application programming interface (API) for accessing database management systems.

> accessible.' We then determined how to structure keywords within columns and integrate them into the database hierarchy." (Mr. B, former IT specialist)

Numerous micro-decisions like these were embedded in algorithms, delegating various competencies to the technical device (Akrich, 1991). These technical choices fundamentally shaped how users interact with *juriDict*: navigation is structured through a single-screen, column-based interface. This integration highlights the interdependence between social or material dimensions of the device — designing a single-screen, multi-column format constitutes a direct technical "translation" of the human requirement for clear and accessible information. Consequently, this structuring method influences user practices, as they now search for information within a predefined hierarchy that, in turn, is continuously shaped by their usage.

The third phase involved executing verification queries to ensure the completeness of imported data. Upon successful validation, the final integration phase transferred the data from the temporary database to the production database, completing the importation process.

These three phases collectively form the first module of *juriDict's* architecture, they are summarized in Figure 9:

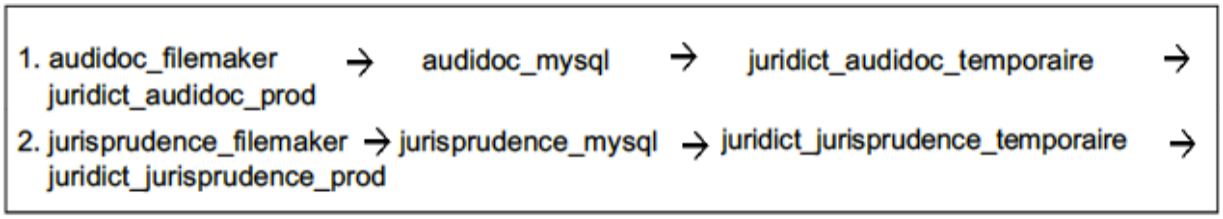


***Figure 9**. First module of juriDict's architecture: Database part*

Subsequently, Mr. B concentrated on the second module of the *juriDict* architecture, the back-end part (see Figure 8), which functions as an intermediary between the database and the user interface. This module is designed using two interconnected programming languages, *PHP*[53] and *Perl*[54], which ensure stable data importation and enhance filtering capabilities. The third module pertains to the user interface, which facilitates user interaction with the system.

[53] Hypertext Preprocessor: An open-source scripting language particularly well-suited for web development.
[54] A free programming language that is especially effective for processing text-based information.

3.2. Definition of the interface

The development of *juriDict* required more than just production databases, algorithms, and programming languages; a user interface was essential to complete its architecture. The interface comprises a graphical component designed using *CSS*[55] and a processing component designed in *HTML*[56]. When a user submits a query through the interface, it is received in *HTML* and subsequently transmitted to *PHP*, which translates the request and directs it to the production database. The database then retrieves the requested information, making it accessible to the user through the interface, which effectively serves as a bridge between the material and human worlds.

Given that these queries operate asynchronously — meaning communication between the user and the database does not occur simultaneously — Mr. B integrated *JavaScript*[57] to improve responsiveness and smoother user experience. While this enhancement improved interactivity, Mr. B acknowledged a trade-off, stating that "unfortunately, this new script also increases the complexity of the code." The socio-technical device under examination is thus the result of a series of negotiated compromises between human and non-human actors. The technical design of *juriDict* was completed within a year, after which the application was made publicly accessible.

Over time, user interactions led to further refinements. Initially limited to keyword-based navigation, *juriDict* was later expanded to include two additional search functionalities: a simplified full-text search providing broader access to textual information and an advanced search feature enabling users to filter results based on decision domain, case type, reference number, date, and other criteria (Joassart, 2008). These enhancements underscore the extent to which technical choices shape legal practices (Orlikowski, 2007). As Akrich (1991) suggests, users must adapt their behaviour to the material framework since they lack the ability to modify it directly. The *juriDict* interface remains relatively fixed, requiring users to adapt, to “subscribe” to its structure and adhere to its prescriptions.

The reliance on a single interface for accessing information reveals another aspect of the materiality of Belgian administrative law. The design of the technological device introduces a new

[55] Cascading Style Sheets: An open-source language based on rule-based code regulation (using an "IF... THEN..." structure).
[56] HyperText Markup Language (HTML): An open-source markup language used for structuring documents intended for display in a web browser.
[57] A script-based programming language that executes within the web browser to enable specific functionalities on a webpage.

form of textual support — namely, a dynamic digital medium (Bachimont, 1996). For users, the screen becomes a unified repository for various types of texts that were previously printed and stored in distinct physical formats. The digital interface creates a continuous textual environment, blurring the boundaries between different document types such as opinions, orders, case files, letters, articles, and laws from their material inscriptions (Chartier, 2006). “We started with documents, and now we navigate “data landscapes”” (Latour, 2011, p. 35). Digitalization thus provides access to an extensive collection of documents, no longer confined within the physical binding of a book that we could hold in our hands, but rather fragmented into distinct elements that circulate freely. The inability to physically spread out, stack, or spatially organize electronic documents makes it more difficult to grasp the entirety of a document and reposition it within its broader hypertextual context. As a result, readers may lose the interpretive guidelines necessary to make sense of the content in its full context (Bachimont, 1996). To mitigate this risk of disorientation, the structure of *juriDict* is designed to guide users through this evolving data landscape. At its core, *juriDict* reinvents a hierarchical structure and offers keyword-based searches, yet this approach introduces the potential for fragmented reading experiences segmented into thematic categories. In *juriDict* — and more broadly in digital environments — textual entities such as rulings are composed of multiple sub-entities, including legal points, keywords, individuals, organizations, and domains. These sub-entities can be accessed independently, without requiring users to engage with the full decision from which they originate (Chartier, 2006). Consequently, one may consult a specific legal point without reading the entire ruling or knowing how many legal points constitute the decision as a whole. While some legal professionals continue to systematically review entire rulings to fully understand their implications beyond an isolated legal point, this discipline is also embedded within the technical device itself as it evolves through ongoing updates and data maintenance.

It is important to highlight that the term "dematerialization" of law (Bernelin, 2021; Mougenot, 2015), despite its frequent usage, is somewhat misleading. Rather than eliminating materiality, it represents a process of "rematerialization," wherein new forms of textual support, programming languages, system designers, developers, and users collectively contribute to the growing and increasingly complex network of jurisprudential access. This network continues to expand, densely populated by both human and material entities (Latour, 2011) .

4. Maintenance of the juridico-technical infrastructure

Ensuring the stable functioning of an application after its deployment necessitates ongoing maintenance. This process involves the continuous feeding of databases (4.1) and the sustained upkeep of the technical infrastructure (4.2).

4.1. Database feeding

To uphold citizens' rights to continuous access to updated legal information, the *Audidoc* and *Jurisprudence* databases require constant feeding. This responsibility remains with a select group of legal attachés, who ensure the ongoing integration of new data. Since their role involves assisting auditors in drafting reports, these legal attachés frequently consult their respective language-based databases “to familiarize themselves with prior rulings in similar cases.” In practice, when an auditor submits a case file to a legal attaché, keywords are extracted from the file to initiate a search in *juriDict*. The results inform the drafting of the report by the legal attaché, which is later submitted to the magistrate. Once the case is adjudicated, the ruling is returned to the legal attaché, who integrates it into the database. Each decision undergoes a meticulous breakdown process, where, a legal attaché explains, it is “deconstructed into individual elements, each encapsulating a single legal point.” "The identified legal points are then 'de-factualized', meaning they are described independently of their specific context — stripped of specific details such as names, administrative locations, and other case-specific particulars — to extract general legal principles,” she continues. The resulting output is referred to as an "outline." Once validated by the magistrate, the outline is encoded into the database.

This structuring of legal data revolves around a fundamental question in legal reasoning: how should such information be classified?

> "This is the most intellectually demanding part of the process because we must anticipate how users will seek out specific legal principles within the database. Since the database is structured hierarchically using keywords, our task is to determine the most appropriate keyword for indexing the legal point in question. They click on the keyword, which is then linked to the relevant passage." (Madame Z, legal attaché)

As each legal attaché is responsible for encoding their own outlines, quarterly coordination meetings provide a platform for refining selection and classification methods and standardizing the drafting principles for outlines. To facilitate this process, a structured framework is provided to guide attachés through the classification procedure. The process begins with the submission of a request, followed by an analysis of its justification, the relevant legal contexts, and the rationale for its inclusion. In some instances, a single legal point is linked to multiple keywords. Similarly, a ruling may encompass several legal principles, each requiring classification under the appropriate keyword(s). Consequently, a single ruling may appear multiple times in the database, as Madame Z elaborates:

> “Let us imagine a case involving an urgent suspension request. If the chamber determines that the petitioner has filed the request too late, the ruling would be categorized under "Injunctions → Extreme Emergency Procedure → Petitioner’s Conduct → Timeliness of Action." The ruling would then be annotated with a description of how the issue was addressed within the injunction process. However, the same ruling might also be classified under other relevant categories, like case specific ones. For instance, if the case concerns a civil servant contesting a forced resignation, the decision would also be filed under "Public Service → Federal Government Personnel" or "Regional/Community Personnel," depending on the administrative body involved. Next, it would be categorized under "Disciplinary Decision → Forced Resignation → Injunction." As a result, the ruling would appear in two locations within the database.” (Madame Z, Legal Attaché)

As jurisprudence accumulates and new cases emerge, new keywords are created and integrated into the existing classification system. To prevent the database from becoming excessively complex, the Council of State has established a "Keyword Commission" composed of magistrates and legal attachés. This commission ensures that the volume of keywords remains manageable, preserving the database’s structural coherence. Once a new keyword is approved, the legal attaché requests its inclusion by the documentalist responsible for database management. Since the documentalist lacks formal legal training, legal attachés must guide them through the “path to follow” within the hierarchy to determine the appropriate placement of the new keyword. This process exemplifies how legal norms are translated and embedded into a technical infrastructure.

The interdependence between legal professionals, IT specialists, and documentalists reveals, from the bottom, the juridico-technological infrastructure that enables *juriDict's* functionality. Given the uniqueness of each legal case, legal professionals must select elements they consider relevant based on specific contextual details. This process requires a combination of intuition, to navigate the inherent ambiguity of legal norms and give them meaning (Dubois & Schoenaers, 2019), and the application of logical and linguistic principles to interpret legal texts and the underlying acts of will and knowledge (Licoppe & Dumoulin, 2019). Consequently, *juriDict* encapsulates a substantial body of legal expertise within its digital infrastructure. The expertise of legal professionals, documentalists, and IT specialists has allowed the development, design, and continuous enhancement of this tool, making it increasingly effective. By refining, filtering, codifying, and systematically categorizing legal information using keywords, *juriDict* allows users to efficiently "navigate" and "find their way" in the vast database (Libmann, 2017). Human agency remains central to the development and operation of *juriDict's* algorithms, just as these algorithms, in turn, shape legal research and analysis practices and the reading and writing of the law. This reflects once again the mutual entanglement between the material (the application) and the social (the human work that precedes and follows its use), which constitutes the socio-materiality of administrative law as it evolves (Orlikowski, 2007).

While *juriDict* has certain limitations, as discussed in the following section, it also offers significant advantages. The application enables the Council of State to maintain a relatively uniform and coherent decision-making practice while still accommodating the specificities of individual cases and societal changes. Internally, legal attachés systematically rely on *juriDict* at two key stages of legal proceedings: first, when they receive a case file, to determine the legal principles relevant to drafting their reports; and second, when they feed the database by incorporating newly identified legal points from rulings. The more these professionals contribute to the database, the more they reinforce its structure, creating a continuous cycle where their work enhances their own work tool, which in turn feeds their professional practices and legal knowledge. These systematic uses make *juriDict* a valuable decision-support tool. Each new entry into the database further streamlines research, analysis, reading and legal drafting processes. By continuously using *juriDict*, the members of the Council of State actively contribute to shaping the very law they later draw upon to adjudicate cases — and to making it publicly accessible.

4.2. Technical maintenance

All technical infrastructures require continuous maintenance, as hardware, software, and programming languages evolve with technological advancements. Some components emerge, while others become obsolete, requiring replacement or repair. Ongoing maintenance is essential to ensuring the longevity of an application that is widely valued by both internal and external users. The modular architecture of *juriDict* appears to facilitate this process, as modifications can be made to one of its three core components — database, back-end system, or user interface — without affecting the others. Consequently, if an update is required, the entire application does not need to be migrated to a new version, as each module can be adjusted independently. According to Mr. B, "this represents a significant advantage for the long-term viability of *juriDict*." Despite continuous technological advancements, he argues that the use of open-source components and standardized development applications provides a measure of stability:

> "The functionality remains exactly as it was originally designed and specified — there have been no changes, even in advanced search features. Every button still performs the exact function for which it was created 14 years ago. There are no obsolescence or inaccessible technologies." (Mr. B, former IT specialist)

Maintaining an infrastructure composed of open-source and modular technologies requires both human and material resources. However, between 1996 and 2016, these resources remained relatively stable before declining, leading to the departure of several key personnel, including Mr. B. The Council of State was unable to offer attractive career prospects for the contract-based IT specialists, recruit new technical expertise, or secure adequate funding to sustain the existing infrastructure. When significant technical issues arise, the chosen solution has been to contract Mr. B for consultancy interventions. Beyond these occasional assignments, however, the remaining staff lack the time and technical expertise necessary to ensure the continuous and structured maintenance of the tool. This limitation explains why certain components, such as *FileMaker 5*, have not been updated. The failure to adapt these elements poses a risk to the application's functionality and, in the medium term, to its survival. Unlike the latest versions of *FileMaker Pro 19*, *FileMaker 5* offers limited functionalities and is no longer compatible with the most recent

operating machines. As a result, several documentalists and IT specialists express concern that the system's reliance on an outdated version of this software may ultimately prove detrimental.

Despite these challenges, *juriDict* remains a source of pride for the members of the Council of State. All individuals interviewed describe the tool as the institution's "showcase" and assert that it has significantly improved the quality of legal work accomplished. Similarly, the administrative law attorneys consulted unanimously recognize the high value of these tools, praising them for their reliability, speed, and efficiency. The introduction of *juriDict* has transformed their legal practices by facilitating access to jurisprudence, which was previously published with unpredictable delays. Rulings were historically available only through paid legal journals and stored in extensive binders without consistent structure or regularity. Lawyers had to manually read and categorize rulings for future reference themselves. With the advent of *juriDict*, the Council of State has made this information more accessible online, free of charge, and in real time. The Council of State's digital infrastructure thus satisfies both internal and external users, enabling them to access vast amounts of legal information in an unprecedentedly rapid, structured, and reliable manner (Hubin et al., 2019).

5. Conclusion

The *juriDict* application represents a remarkable and unprecedented development in the publication of judicial decisions in Belgium. This study examines the socio-material infrastructure that enables this open and free access. A combination of screens, computers, scripts, algorithms, IT specialists, documentalists, and legal attachés worked collaboratively to translate an initial problem statement — how to transition from two distinct internal directories to a single structured and dynamic interface accessible to the public? — into a concrete solution: the continuous and structured availability of rulings via *juriDict*. Analysing this translation process also reveals the socio-material assemblage that constitutes *juriDict*. The technical tool and the human actors are inseparable, mutually shaping one another throughout the phases of development, design, data integration, and usage. The effectiveness of this system is rooted in the interaction between human and non-human actors. In *juriDict's* case, algorithms are shaped by human practices that involve interpreting legal norms, generating new keywords, structuring legal points, and maintaining a technical infrastructure. Simultaneously, the application influences and facilitates legal reading

and writing practices, research methodologies, and comparative case analysis (Licoppe & Dumoulin, 2019). It also serves as a valuable tool for lawyers while providing broad and open access to legal information, benefiting both legal practitioners and citizens. By enhancing legal professionals' ability to manage the quantity and complexity of legal issues they encounter, *juriDict* contributes to reshaping the nature of their tasks and the practice of legal reasoning.

This study offers a bottom-up perspective on the juridico-technological infrastructure that supports *juriDict*. Shaped not only by socio-material arrangements but also by organizational dynamics — such as coordination meetings between legal professionals and the keyword commission — this infrastructure relies on both internal legal data and technical components developed under open-source licenses. The choice to employ open-source solutions rather than proprietary software ensures the Council of State's independence from external actors, whether public (government, prosecution services, administrative bodies) or private (corporations, Bar Associations, legal publishers, consultants, and software developers). Had the jurisdiction opted for proprietary software to build this infrastructure, its independence — and, consequently, the rule of law — would have been jeopardized. Given its role in democratic advancement, can openness of justice and law be achieved without open-source solutions and open data? In a state governed by the rule of law, each jurisdiction is, in principle, responsible for answering this question, provided that the government allocates the necessary human, technical, and financial resources to support this independence.

As this research was concluding, recurring challenges in maintaining the *juriDict* infrastructure were becoming increasingly evident. Within the framework of the Recovery and Resilience Plan (Conseil des ministres, 2023), the FPS for the Interior eventually agreed to allocate the necessary funding for a complete redevelopment of *juriDict* using proprietary solutions and external consultants. The plan envisioned these consultants training an in-house IT specialist at the Council of State to operate the newly implemented solution, which was intended to ensure more accessible and cost-effective long-term maintenance for the existing team. This transition, however, presented two significant risks. First, it implicitly acknowledged the public sector's inability to compete with the technical expertise and knowledge of private industry, as well as its difficulty in recruiting and retaining the necessary "talents" needed for its functioning. Second, it signalled a shift toward a model of commercial and technical dependence, where the Council of State would

rely on private actors and proprietary software for its core judicial functions. Would these external providers of technological solutions and expertise become indispensable to the functioning of this high court, which is responsible for shaping, adjudicating, documenting, and disseminating administrative law? As of now, no formal investment decision has been made in this direction. However, this study underscores the extent to which the socio-material foundations of legal production are evolving. Should this transformation be viewed merely as a sociological — or rather, a socio-technical — anecdote, or does it reveal new uncertainties at the heart of our rule of law?

CHAPTER 6 — DIGITALIZING THE COMMERCIAL COURTS: BETWEEN PROMISES AND PITFALLS

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Abstract: Various authors have been conceiving digitalization as a way to modernize justice and improve legal issues, i.e. address delays, increase legal security, and make justice cheaper and accessible for all. Such normative and techno-determinist discourse has justified several central and integrated projects carried out in Belgium since 1998, which successively failed one after the other. In 2015, the former Minister of Justice changed his strategy: his plan called for the cooperation of legal professions, and for their *enrolment* in the design, development, and implementation of digital tools. This is how the Central Solvency Register, named *RegSol* – or the *Register* – was designed, developed, and launched within the commercial courts in April 2017. The *enrolment* of legal professions seemed to be the solution to finally "modernize" the Belgian justice system after twenty years of trying. *RegSol* was supposed to make justice faster, more accessible and transparent. In this article, we show how and why most of these promises have not – yet – been fully met. Our research draws on two case studies conducted in a big (*Alpha*) and in a small (*Delta*) commercial court between November 2021 and February 2022. It shows that the various obstacles identified in the design and development phases hindered, to a certain extent, the platform's potential to make justice more efficient and accessible. Everyday reality for court practitioners is not yet fully in line with the political promises. *RegSol*'s impact remains ambiguous: while simplifying tracking processes and centralizing information, it also entails new challenges.

Keywords: commercial courts; electronic procedure; digitalization of justice; legal professions; courts practitioners

[58] Pelssers, L., & Dubois, C. (2022). Digitalizing the commercial courts: Between promises and pitfalls. *Recht Der Werkelijkheid*, *43*(2), 112–132. https://doi.org/10.5553/RdW/138064242022043002007

1. Introduction

Various authors (Aoláin, 2007; Kobayashi & Ribstein, 2011; Rabinovich-Einy & Katsh, 2016) have been conceiving digitalization as a way to modernize justice and improve legal issues, i.e. address delays, increase legal security, and make justice cheaper and accessible for all.[59] Access to justice is particularly important in this view, since it often determines the enforcement and protection of other rights (Fierens, 2020). In other words, unequal access to justice threatens social cohesion (Menon, 2020). It is also argued that automating their working process can lighten judges' and court clerks' workload (Mason, 1978); fasten the diffusion of information while increasing its centralization and transparency; reduce printing costs and paper mailing tasks; and facilitate communication between stakeholders (Branden, 2019; Sourdin et al., 2020; Susskind, 2019).[60] Digital technologies would therefore increase the confidence of every citizen in the judicial institution (de Leval & Georges, 2010), while designing tomorrow's courts and lawyers (Geens, 2017; Susskind, 2017, 2019).

Such normative and techno-determinist discourse (Dubois & Schoenaers, 2019) has justified several central and integrated projects carried out in Belgium since 1998 in order to increase effectiveness, efficiency, and transparency, as well as access *to* and trust *in* the judicial system. Unfortunately, these projects failed due to insufficient results and the absence of a change management strategy (Mougenot, 2017). In 2015, the former Minister of Justice adopted a decentralized methodology to accelerate the digital transformation — or "modernization" (Latour, 2012) — of the Belgian justice system. His plan called for the cooperation of legal professions, and for their *enrolment* in the design, development, and implementation of digital tools (Callon, 1984; Dubois et al., 2019; Vanderstichele, 2017a), as described below in section 4. This is how the Central Solvency Register, named *RegSol* — or the *Register* — was designed, developed, and launched within the commercial courts in April 2017.

RegSol is a digital platform allowing the registration and conservation of insolvency cases (bankruptcy and legal reorganization procedure) (OVB & Avocats.be, 2025), the centralization and

[59] "The defence of access rights, and litigation related to them, can be seen as a litmus test of a society's ability to respond to extremity, and a place where the resistant quality of law is tested." (Aoláin, 2007, p. 92)

[60] An essential tool for maintaining accessibility to courts and tribunals at a time when budgetary savings are forcing court clerks to offer less availability to litigants

exchange of data between the different stakeholder of a bankruptcy procedure (Loi du 8 Août 1997 sur les faillites, 1997, Article 5/1). *RegSol* is the first tool resulting from the cooperation between French- and German-speaking Bars (Avocats.be), the Dutch-speaking Bars (OVB),[61] and the Minister of Justice. This cooperation did not involve the court practitioners' participation. In 2016, the legislator decided to adapt the judicial code and the law of August 8 on bankruptcy in order to introduce this Central Solvency Register (Loi du 1 décembre 2016 modifiant le code judiciaire et la loi du 8 aout 1997 sur les faillites en vue d'introduire le registre central de la solvabilite, 2017). It also appointed the Bar Associations as sole managers of this *Register*. By reducing the number of paper claims to be handled by the registry, the proceedings of unpaid claims are expected to be faster and less costly. The Minister of Justice emphasised that "these investments [...] represent 200,000 fewer claims for the registries to process in paper form. This will make the procedure faster and cheaper overall" (Geens, 2017). Belgian lawyers quickly adopted *RegSol* and most of them seemed to be — and still are — enchanted by it. But several magistrates and court clerks keep complaining about problems and breakdowns with the platform. We have considered *RegSol* as a tracer of the power relations between legal professions taking part to the modernization of justice. Taking into account the design, development and maintenance of this platform, what are the different attitudes of these groups towards the strategies to digitalize (access to) justice. What are the objectives and obstacles they attribute to *RegSol*? In doing so, we provide informative, empirical insights into the dynamics of the (lack of) cooperation between legal professions.

Some of the obstacles faced by *RegSol* can be illuminated by a sociological approach. We will therefore adopt a social constructionist perspective[62] (Czarniawska, 2003) to describe and analyse three distinct but interdependent phases through which the platform has been designed, developed, and implemented. This will help us to grasp some of the decisions that have gradually influenced the contrasting attitudes of the various groups of actors involved. By doing so, we will also analyse the *enrolment* (Callon, 1984) of the Bar Associations and the *non-enrolment* of court practitioners as a critical factor, explaining how some actors can happily adopt the tool, while others are experiencing more difficulties.

[61] Two organizations bring together all the Bars of the Flemish-, French- and German-speaking parts of the country. These are the *Orde van Vlaamse Balies* (OVB) and *Avocats.be* (for the French- and German-speaking Bar Associations).
[62] Here, "social constructionism" is used as a methodological framing. In the thesis, it is positioned more explicitly within a relational ontology, a pragmatic epistemology, and a socio-material perspective

While some contributions have already looked at how new technologies can redefine legal professions (Dubois, 2021; Jones & Pearson, 2020; Skjølsvik et al., 2018), and whilst much attention has also been paid to the legal regulation of new technologies (Brownsword, 2008), far less has been written about how new technologies' design, development, and management can impact courts' practices and organization (Donoghue, 2017). Five years after its introduction, this platform requires an empirical analysis of its design, development and implementation among and by different groups of actors in order to assess its contrasting impact on their working context. This case study will thus provide an empirical understanding of the genesis and uses of a platform that is supposed to make justice more accessible and efficient.

2. Qualitative methodology and theoretical frameworks

This study of *RegSol*'s design, development, and implementation draws on a qualitative methodology. In addition to grey and scientific literature reviews on legal technologies in the judicial system, our study builds on previous work carried out between 2018 and 2020 (Dubois et al., 2019) and extends it with two case studies that have been conducted in a big (*Alpha*) and in a small (*Delta*) commercial court between November 2021 and February 2022. In total, 12 on-site observation and 32 semi-structured interviews were conducted with lawyers (n = 4), computer and financial specialists (n = 2), court clerks (n = 7), court registry members (n = 5), consular judges (n = 4), magistrates (n = 5) and curators (n = 5), in Alpha (n = 15) and Delta courts (n = 11). The interview grid consisted of three main sections, respectively devoted to (i) the professional practices of the interviewees, (ii) the uses they were making of *RegSol*, and (iii) the advantages and disadvantages of this tool on their professional practices and working context. During the interviews, some details were asked about the development process of the tool, its speeding and adoption, the adaptation of practices, interactions, procedures and work routines. Every interview was conducted in French and subsequently translated to English for the purpose of this article and lasted between one hour and two-and-a-half hours. Every interview provided both a descriptive account and a meaningful interpretation of the interviewees' working experience and working context. A thematic content analysis was then carried out using the Corpus© tagging software of the University of Liège.[63] In addition to this empirical material, web and documentary searches

[63] https://corpus.lltl.be

were conducted to collect some "managerial discourse" relating to *RegSol*, including online publications as well as policy documents, technical manuals, minutes drawn up by Bar Associations, blog posts, interviews in the press, and posts on LinkedIn. These documents present "who" or "what" *RegSol* is, help "discovering" the platform, and "tell" more about its uses. This qualitative material has been examined through textual analysis, using open coding techniques to identify recurrent themes, and two conceptual frameworks to inform the analysis of *RegSol*'s genesis and uses.

First, the sociology of translation developed by Michel Callon (1984) helps us accounting for this process. Callon identifies four phases in the collective creation of such a tool. Everything begins with a *"problematisation phase"* where the actors involved agree on the problem to be addressed. "Each entity enlisted by the problematisation can submit to being integrated into the initial plan, or inversely, refuse the transaction by defining its identity, its goals, projects, orientations, motivations, or interests in another manner"(Callon, 1984, p. 207). This moment is important because it is the starting point of a project, and it binds the actors to the project. *Interessement* is the second phase. "To interest other actors is to build devices which can be placed between them and all other entities who want to define their identities otherwise" (Callon, 1984, p. 208). The third phase is that of *enrolment*, defined by Callon as "the device by which a set of interrelated roles is defined and attributed to actors who accept them" (Callon, 1984, p. 2011). The fourth and last phase lies in the *mobilisation* of allies to expand and densify the network they have begun to develop around the interessement device. But mobilisation remains uncertain: "Will the masses […] follow their representatives?" (Callon, 1984, p. 214). This empirical-conceptual framework is based on the postulate that innovation emerges in a network populated by human and non-human entities (Akrich et al., 2006). The translation process emphasizes the continuous displacements of goals, interests, devices, human beings, objects and inscriptions (Callon, 1984, p. 223). Throughout a translation process, some actors redefine their short-term interests to align with other stakeholders. Other actors (or *translators*) occupy a central position among these stakeholders (*inter-esse*), in order to formulate a common objective that creates meaning (problematisation), overcomes divergent interests and redefines identities (*interessement*), roles (*enrolment*), behaviours and positions (*mobilisation*).

According to Callon, if some actors "can submit to being integrated into the initial plan", others can "refuse the transaction by defining [their] identity, [their] goals, […] motivations, or interests in another manner" (Callon, 1984, p. 207). To better understand how some actors refuse a transaction, we will borrow from Hirscham's (1972) triptych of reactions to dissatisfaction: exit, voice, and loyalty. The option of exit occurs when individuals choose to escape from the dissatisfying situation instead of actively seeking to improve it. In this case, they prefer to put an end to what they perceive as an unproductive relationship. Hirschman also underlined that by exiting, people effectively relinquish their ability to use the voice strategy — that is, exiters have no chance of influencing management's actions from the outside. They won't be able to benefit from any future improvements, either. The second strategy is voice. It entails discontent of the situation directly to the management or authorities with the hope of recovery. Hirschman perceives voice as helpful: it is constructive, striving to improve the entity while respecting the legitimacy of the current authority. The third strategy is what Hirschman calls loyalty. It refers to an individual who does not exit regardless of his or her underlying reasons to remain in a deteriorating situation. In our particular case study, court practitioners have from the outset expressed their dissatisfaction with the cooperation agreement between the Minister of Justice and the legal professions. They felt that this agreement was threatening the independence of the judiciary, and they now feel that *RegSol* updates these risks. As we will see further, this is why they didn't take part in the design and development of the platform and are struggling to use it.

3. The rise of a new necessity: A digital justice

In the last twenty years, digitalization has often been conceived as beneficial to improving universal access to justice (Salmerón-Manzano, 2021). A first argument put forward by various authors lies in the fact that digital technologies would enable the justice system to reduce the "justice gap" (Menon, 2020), which is defined as "the disparity between the legal needs of low-income persons and the resources available to meet those needs."[64] According to this argument, technology can provide people with quick, affordable and equitable legal solutions, even if "the rush to digitalization [might lead to ignoring] due process and transparency in the name of efficiency" (Schmitz, 2019). A second argument put forward by policy makers is that digital

[64] Legal Services Corporation, The Justice Gap: Measuring the Unmet Civil Legal Needs of Low-Income Americans 6 (June 2017) ('LSC Report').

technologies can lighten judges and court clerks' workload through the automation of their working process (Dumoulin, 2016; Geens, 2017; Mason, 1978; Procopiuck, 2018). Improving productivity in the courts is of greatest importance as governments seek ways of meeting with escalating demands for services with increasingly limited resources. This is even more important in the case of commercial courts as the European Commission specifies that efficient judicial systems are essential for the functioning of the internal market and a prerequisite for economic growth (European Commission, 2020). A third argument is that new technologies can fasten the diffusion of legal and judicial information, while increasing its centralization and transparency (Dubois & Pelssers, 2021; Germain, 2007).

These arguments are promoted by the European institutions. In fact, digital technologies have become an integral part of the European judicial systems, especially in their practices of writing, researching and archiving legal texts, court records, judicial files, and sources of legislation (European Commission for the Efficiency of Justice (CEPEJ), 2020). But the European Commission goes further by insisting on the fact that "ICTs must be tools or means to improve the administration of justice, to facilitate the access of litigants to the courts and to reinforce the guarantees offered by Article 6 of the ECHR, namely access to justice, impartiality, independence of the judge, fairness and reasonable time for proceedings" (Consultative Council of European Judges, 2011). According to this normative discourse, digital technologies can automatically increase the confidence of every citizen in the judicial institutions, while designing tomorrows' courts and lawyers (Susskind, 2017). But despite the breadth of these discourses, digital technologies remain under-exploited in the Belgian judicial system. The European Commission for the Efficiency of Justice ranks Belgium at the 35th place among the 47 countries evaluated, according to their overall level of involvement with ICTs (European Commission for the Efficiency of Justice (CEPEJ), 2020, p. 100).

In 2001, drawing on the recommendation of the Council of Europe (Committee of Ministers, 2001), Belgium has launched a major project aimed at managing all legal proceedings through a single application (Verougstraete, 2007). Unfortunately, this project failed.[65] In 2008, the idea of a major application, reflecting a single global strategy, was replaced by a modular and cooperative

[65] Various reasons have been presented to explain this setback: the firm in charge of the project bad quality of work, the lack of coordination of the judicial, the resistance of the judicial practitioners to the project, the inadequacy of the method of change adopted to tackle the ambitiousness of the project that was intended to be global (Wynsdau & Jongen, 2015).

strategy (Dubois et al., 2019). This plan was addressing the diverse interests and needs of the judicial actors working in different jurisdictions. This is how a variety of home-made innovative tools and software have been crafted locally by some passionate magistrates and court clerks. Several small modules were then developed, independently from each other (Mougenot, 2015). This observation is especially accurate within commercial courts.

The commercial court has exclusive jurisdiction to hear actions and disputes directly related to insolvency proceedings, such as bankruptcy and judicial reorganization (Cours et Tribunaux de Belgique, 2025a). These proceedings play a key role in market regulation (Frade et al., 2020) as they involve companies that still have assets, but they are complex as they bring together various groups of actors: the litigants are legal entities or natural persons wanting to file for bankruptcy (or restructuring), or being cited in bankruptcy; the court registry is the administrative hub centralizing documents, managing the cases at each stage of the procedure, and appointing curators; curators are lawyers representing the bankruptcy entity and the creditors, and ensuring the good management of the case; magistrates and lay judges — named consular judges — examine the file at the end of the process, during several hearings. Each chamber of the court is composed of one professional judge and two consular lay judges, the latter being private entrepreneurs, company administrators, accountants, auditors, etc. They assist the professional judge by giving him or her the opportunity to discuss the case, bringing in their own business experience. Consular judges represent "the real world" within the court. Like a judge said, "for us, they have a great added value because they have a large and deep field experience" (Magistrate, November 2021, Court Alpha). Through discussions, they allow the law to be adjusted to contingent business practices, shaping decisions that are based on legal and business norms and information. By subjecting the law to debate between justice (magistrates) and business practitioners (consular judge), the decision issued by the court serves not only to "render justice" (*justice*, in French) but rather to render "fairness" (*justesse*, in French). The court is constantly seeking a balance between legal prescriptions and commercial norms. Insolvency files go through different chambers (between three and five depending on its complexity) and are part of a non-linear process as they are continuously passed back and forth between these multiple actors. Hence, the bankruptcy and restructuring procedures are complex and lengthy and they, therefore, constitute a heavy financial and administrative burden for the court. Especially, compared to other insolvency procedures, such as liquidation and dissolution, which include companies with no

assets, that are managed within one hearing, without involving any curator.

As previously mentioned, the complexity of the procedure is also reflected by a profusion of heterogeneous, handcrafted, and non-integrated digital tools. As we will below (see *infra*, section 4)*, RegSol* itself was engendered by a home-made tool called *FailManager*. This tool had been developed and used by the consular judges in Gent since 2011. It enabled them storing and sharing copies of local files with the different parties in the bankruptcy.

In addition to not being integrated, most of these tools do not communicate with each other. They each intervene at specific and different moments of the insolvency procedure. This forces the court workers to keep a paper file as a basic legal reference all along the process, and then, to convey each of these tools independently when the procedure requires it. This heterogeneity reflects the absence of a common digitalization policy for the courts, but also the local and spontaneous initiatives of different practitioners to make their everyday work easier. Developed at different times and by different actors, each tool fulfils a unique function and relies on specific technologies that make them incompatible.

Nonetheless, each tool, including the *Register*, has been developed to bring benefits such as an easier and faster access to a more transparent, efficient, effective justice. These values are particularly important in the context of insolvency and restructuring procedures: access to courts and legal information, centralization and transparency (file tracking) are essential factors to maintain equality between creditors (Frade et al., 2020). The electronic access to the file also gives the opportunity to insolvency practitioners in general, but especially consular judges and curators, to monitor and produce operations in just a few clicks. The effectiveness of such procedures maximizes their outcomes and responds to market temporality (Dubois et al., 2019).

4. Designing a new tool: Is the *enrolment* of professional bodies a solution?

To understand how *RegSol* was shaped, it is necessary to go back to the Belgian policy aiming to modernize Justice through digitalization. In 2016, the former Minister of Justice, Koen Geens, decided to strengthen and materialize the modular and cooperative strategy launched in 2008 (Service public federal Justice, 2016a). To do so, he chose to formally *interest*, *enrol* and *mobilise*

legal professions (Callon, 1984; Dubois et al., 2019) towards the digital transformation of the Belgian justice system. His aim was to improve access to and efficiency of justice in a context of public budget shortages. The Bar Associations (OVB and Avocats.be), the notary's office and the bailiffs immediately became enthusiastic about the Minister's plan, but the judiciary actors and the central administration were rather reluctant. They were concerned and upset about the idea that an IT service traditionally performed by the public administration could be outsourced to the private sector. Despite the opposition of the judiciary, a protocol agreement bringing together the Minister of Justice, his administration, as well as the representatives of the Bar Associations (OVB and Avocats.be), the notary's office and the bailiffs, was signed on June 22, 2016. As for the colleges of the Public Prosecutor's Office and the Judiciary, they refused to sign the cooperation protocol, mainly because of a disagreement with what some of them described as a "private-public partnership."

> "More and more private operators are taking part to the management of procedures that were traditionally and purely the responsibility of the judiciary. Judges are not very favourable to such initiatives. I think that the State should ensure the public service of justice, and not private actors." (Judge, April 2018)

This reason is exemplified by a magistrate in the excerpt below:

> "The goal of a private firm is to produce money and profit, while the goal of the court is to provide the best and broadest public service possible in the shortest possible time. These objectives are diametrically opposed. For the Joint Bar Associations, it's more profitable if there is less service, and for justice, it doesn't matter how much money is there: all the cases should be processed equally." (Magistrate, February 2022, Court Delta)[66]

While the Judiciary first chose to *voice* their discontent towards the plan of the former Minister of Justice, they were not heard. They did not manage to lead the latter to adapt his initial strategy according to their requests. Hence, they decided to not sign the protocol agreement, *exiting* what they perceived as an unthinkable deal between public and private actors.

Despite the *exit* of the judiciary, the *interessement* of the other legal professions enabled the

[66] The reasons behind the concerns of judges and public administration will be further explored in the next paragraph.

Minister to finally succeed in advancing in the digitalization of the Belgian justice system. The 2016 protocol led them to design and develop several tools. Among them, the Bar Associations positioned themselves as leaders in the design and development of *RegSol*. According to the Bar Associations, this project aims "to make justice more efficient and to improve the citizen's access to justice within the framework of a democracy concerned with offering an efficient and accessible judicial system to all" (Avocats.be, 2017). From a technical point of view, *FailManager* inspired the Bar Associations. The existence of this already widely used tool motivated them to design and develop a similar tool for all the Belgian commercial courts, which they named *RegSol*. The Joint Bar Associations then adopted a specific financial and organizational strategy. They first decided to outsource the design and development of *RegSol* to a private company, named NV Aginco. The Joint Bar Associations acted as a relay between this company and the end-users to implement the solutions. And they delegated the supervision of *RegSol*'s development to Diplad, an IT-firm that was founded in 2014, within the Flemish Bar Associations (OVB). Both Bar Associations pre-financed the platform. Their business model was based on fees in order to manage bankruptcy cases and claims filing (OVB & Avocats.be, 2025). By doing so, the Bars opted for an entrepreneurial approach. On the one hand, this entrepreneurial attitude benefits its members. Lawyers have an interest in evolving in a digitalized environment and in using faster and more transparent electronic communication tools:

> "From a competitive point of view, the big international law firms represent an immediate threat to the majority of our members. If Justice does not modernize quickly, it is the survival of our profession that is at stake. Not only must we try to adapt to technological progress, but we must also try to participate in their development rather than undergo it." (Lawyer, January 2016)

On the other hand, investing in an infrastructure such as *RegSol* requires a financial balance to be found. They justify this risky operation by insisting on its necessity:

> "[Investing] is not part of our legal mission, but if we don't do it, the risk is that nothing will happen." (Le Vif, 2017)

However, the Bars are experiencing some structural budgetary difficulties (Tainmont, 2020):

> "[It] was anticipated that IT projects would be revenue generating in the future, so past budgets were voted on the basis of loans to be taken out and therefore repaid at some point. However, not all of the estimated revenues have been realized. But the loans must be repaid." (the treasurer, the administrator in charge of IT projects and the financial and human resources director of Avocats.be)

At this stage we better understand the controversies that have animated *RegSol* from the beginning. In 2016, the judiciary criticised the Minister's strategy consisting of involving legal professions in the "modernisation" of justice. They saw the risk of transferring ownership and control of justice from public to private. Their reluctance was then reinforced by the entrepreneurial role adopted by the Bar Associations. By relying on private partners to design *RegSol* and by defining a business model to finance the tool, they were adopting a logic of privatisation of justice that could not satisfy the judiciary. These controversies also characterize *Regsol*'s development and implementation processes. The non-alignment between the different stakeholders in the design process is a first obstacle in the creation of an efficient and access to justice-oriented tool.

5. Development challenges: Legitimacy of *RegSol* and the Joint Bar Associations?

The development of *RegSol* took place between the signature of the protocol agreement in 2016 and its official launch on April 1, 2017. By taking the lead on the design and conception of *RegSol*, the Joint Bar Associations position themselves as project leaders, working to translate the protocol into a concrete and efficient platform. To achieve this goal, they tried to define a common goal that makes sense to all stakeholders, overcomes divergent interests, and considers the different needs.

5.1. From lawyers' enthusiasm to the disenchantment of court practitioners

On that level, the Bar Associations seem to have successfully interested, enrolled and mobilised some users, especially creditors and curators. They have completely integrated the tool into their habits and are propagators of the initial *script* (Akrich, 1987). The creditors are unanimously convinced that the tool serves their best interests and meets their needs, especially via the online

filing of claims and the remote file monitoring. The curators are first and foremost lawyers, whose representatives (Joint Bar Associations) have been designing and developing the tool. To put it briefly, *RegSol* was created by them and for them. This sheds light on their favourable opinion towards the tool and its easy integration into their practices:

> "The physical file in its paper version immediately became obsolete and is a hindrance to the principle of transparency of the procedure on the one hand and to the speed of communication on the other. And then *RegSol* considerably increases our access to the files, to the registry, and to the court. This centralisation allows us to work more efficiently" (Lawyer, June 2018).

The Joint Bar Associations have also worked to *mobilise* their members through some training sessions, conferences, and consciousness-raising workshop (Dubois et al., 2019). Once *mobilised*, lawyers became *RegSol*'s advocates and users, densifying its network… among lawyers and curators. However, the Joint Bar Associations did not manage to *interest* the judiciary, i.e. magistrates and court clerks.

Part of the explanation lies in the critical attitude of the magistrates towards the protocol (*non-interessement* and *exit*), followed by their passive behaviour during the development of the tool (*non-enrolment*). This resignation did not allow the bar to take into consideration the specific needs of magistrates and court clerks, so that the platform has not been adapted to their working contexts. Their *mobilisation* was therefore jeopardized and this explains, in part, their lack of satisfaction and adhesion.

But another part of the explanation may also lie in the lack of effort by the Joint Bar Associations to *enrol* and *mobilise* the court practitioners. Indeed, one of the Bar Associations' administrators acknowledges that "there may have been too little attention paid in the first instance to consulting with the court professionals themselves on how to handle a bankruptcy case" (Bar Associations' Administrator, December 2021). By considering the needs and interests of some users more than others, the specific working context of registries and commercial courts might have been somehow neglected while developing the platform. Upstream, the Bar Associations did not manage to *problematise* the project in a way that made sense to judges and court clerks. These discrepancies are then reflected in the development process of the tool and in the technical choices. On the other

side, by choosing the *exit* strategy in 2016, magistrates and court clerks reduced their chances to comment and influence *RegSol*'s development. This, in turn, prevented their needs and interests from being taken into account at this stage.

5.2. Judicial independence threatened by entrepreneurial *problematisation*?

This vicious circle reinforces the reluctance of the Judiciary toward the introduction of *RegSol*. After having *exited* the protocol agreement, they adopt a *'voice'* posture in some professional forums and during the interviews to denounce the tool's dysfunctions. Their arguments mainly structure around a triple loss of independence for the judiciary. First, they point out the top-down and external imposition of a normative and techno-determinist discourse, stipulating the need to digitise justice, no matter how. In 2017, *RegSol* was imposed by the legislator while the justice system had no control over the strategic and technical choices to be made. This leads to their second argument, according to which the Bar Associations own and control the tool, which induces a dependency relationship of the judicial actors vis-à-vis the Bars. "The courts and the (economic) companies depend on the [Joint Bar Associations] and their private partners for the proper handling of bankruptcy cases" (Vanderstichele, 2017b). And if judicial actors request any adaptation of the tool to better suit their needs, they depend also on the goodwill of the Bars. According to magistrates, "the courts should rather decide on the development priorities and the modification to be made" (Magistrate, November 2021, Court Alpha). A third matter of concern raised by the magistrates relates to the implicit transfer of the data ownership to the Bar Associations… and their private partners, such as Diplad and NV Aginco. They fear that these private companies can extract information for commercialization. Some even fear that the Bars will develop a new business model around the sale of economico-financial data.

Let's dwell for a moment on this last observation. Prior to 2017, the organization of the data and its ownership were not questioned. The links between the various files were mainly located in the judges' brain and sometimes inscribed in the case law summaries published in some legal journals (Vanderstichele, 2017a). Since 2017 however, *RegSol* collects all the data and documents related to insolvency proceedings (Loi du 1 décembre 2016 modifiant le code judiciaire et la loi du 8 aout 1997 sur les faillites en vue d'introduire le registre central de la solvabilite, 2017), such as the companies' identity, their economic activity, the list of creditors, etc. This data will be kept by the

Administrator for thirty years from the date of the judgment to the closure of the insolvency file (Avocats.be & OVB, 2021). By appointing the Bar Associations as joint managers of the *Register*, "the law implicitly establishes a transfer of (1) the organization of the solvency register, (2) the administration of its data, and (3) certain property rights relating to the data" (Vanderstichele, 2017b). It seems clear that this data and the models that can be derived from it are very valuable to private associations and policymakers. The Bankruptcy Code makes no explicit provision about the ownership of this data. This means that the Joint Bar Associations are free to organize the data, provide access to the data, and exploit the data. As Vanderstichele (2017b) explains, "the joint Bar Associations therefore can behave like a full owner and sell the data for profit, provided they respect the privacy laws." Hence, the manager (the Bars) may publish or communicate information from insolvency proceedings and decisions, free of charge or against payment, without violating the General Data Protection Regulation (Avocats.be & OVB, 2021). *RegSol* marks the transition from a centralized government (where the courts kept a register containing all data related to bankruptcy cases, kept control on and enjoyed unlimited access to this register, while other actors, such as companies, lawyers and creditors, enjoyed a limited access) to a distributed government (the Belgian Bar Associations organize and administer the register, while the courts do not participate in this organization anymore). In this context, commercial courts are becoming hubs in the bankruptcy data and information networks. Such an overhaul of court administration questions their autonomy and independence. Who has rights to this data? What are these rights? And how is the data managed and exploited? These questions are too important from a socio-economic point of view to be decided without any social debate.

Faced with these concerns, the Bar Associations have repeatedly called for order, as in the following press release:

> "The recent criticism of certain senior magistrates is unfortunate: the Bar and the Judiciary are not adversaries here; they have no conflicting interests. Avocats.be and the OVB therefore call for a positive spirit to lead all the judicial actors to a new consultation. It is only through intense collaboration between the judiciary, the legal profession, the administration, the court clerks, the minister and his strategic unit that the necessary modernisation of justice can be achieved. All have the historic obligation to advance this modernisation and digitalisation, to improve the citizen's access to justice within the

> framework of a democracy concerned with offering an efficient and accessible judicial system to all." (Avocats.be, 2018b)

Such calls emanating from the Bar Associations could not be heard by the magistrates and other court practitioners, as they did not recognize any legitimacy in the entrepreneurial role of the former. At this stage, we can see how the legitimacy of *RegSol* and that of the Joint Bar Associations intertwine (Swanson & Ramiller, 1997): as they were not able to legitimize the platform, they could not *mobilise* court practitioners in a common project.

6. Implementation reality: Political promises vs practitioners' experiences

Let us go back to 2017, when the Minister of justice announced a revolutionary tool for the insolvency and restructuring proceedings. He promised that *RegSol* would "make the procedure faster and cheaper overall" (Avocats.be, 2017). However, the various obstacles identified in the design and development phases hindered, to a certain extent, the platform's potential to make justice more efficient and accessible. Indeed, everyday reality for court practitioners has not yet fully met its political promises. Its impact remains ambiguous: while simplifying tracking processes and centralizing information, it also entails new challenges.

6.1. Court practitioners' experience: Fees, workload, impoverished labour, and patience

In addition to the tensions already noted, certain principles are undermined by this platform, such as its user costs. If the use of *RegSol* is mandatory by law, it also requires the payment of a fee. It means that a service that was previously free for litigants becomes chargeable, which questions the public policy intentions to make justice "more accessible and cheaper" (Avocats.be, 2017).

And what about ease of access to justice? Beyond the actual access to the tool, many actors, such as court clerks, registry staff members and judges, regret that the information available on *RegSol* is not intelligible and overly technical.

> "The tool is not user-friendly, proof is that there are many handling errors, because it is not

> designed to respond to the procedure we have to follow" (Clerk, February 2022, Court Delta)

This is even more concerning as the bankruptcy and restructuring procedures are already complicated in nature. As previously mentioned, it relates to various actors located in several chambers and requires a variety of documents.

As a result, a lot of people fill in the boxes in an approximate way, causing difficulties for the registry and for further processing of the procedure. The poor quality of information requires it to be reviewed and updated by a court worker, slowing down the handling of the case, and weighing up the registry workload. This also change the very nature of the work at the registry since their mission of helping and advising the litigant has been transformed in practices of "information control."

> "Before 2017, when a request was filed by a litigant, it was signed and it was processed. With the electronical platform, if it is not filed in the right item, we have to send it back to the person saying 'you did not file it in the right item', with a comment. So even if *RegSol* is supposed to speed up the file process, there is a workload appearing from the use of the system itself." (Registry staff member, February 2022, Court Delta)

Fluidity and continuity problems are also encountered by court practitioners, as the platform sometimes needs one minute to load a page. This problem is all the more serious when several pages need to be loaded to submit a single document. Furthermore, the handling of certain functionalities is not automated. For example, file access to the consular judges must be given manually and individually by the registry. If 200 files are processed during a hearing, it represents 400 access rights to be given, since there are two consular judges per hearing. This task requires a lot of patience and many manipulations, so that it takes about one minute to grant a single access. Knowing that there are several hearings a day, this type of assignment mobilises one person during a whole day of work. This contributes to considerably transform and impoverish the nature of some court clerk's work:

> "Clicking on the same item all day every day is far from being intellectually stimulating" (Chief of clerk, November 2021, Court Alpha)

And yet, the sending of documents and the file management is no longer subject to postal time frames:

> “Before, you never got a response from the curators for 5 to 6 days, whereas now with *RegSol*, in two seconds you can get its response if he is alert. He sees the notification on the phone, and he answers right away." (Consular judge, February 2022, Court Delta)

Strictly speaking, *RegSol* makes file management faster. But as these new difficulties take up some of the workers' worktime, the workload has not decreased, it simply became different. Hence, the goal to accelerate the procedure does not seem to be realized.

6.2. Digitalization as facilitation: a false promise?

Regarding the promising efficiency *RegSol* was supposed to bring by replacing paperwork into an electronic and centralized procedure, lots still need to be done. At this time, the ambition to have a file that would only exist electronically into *RegSol* is not realistic, according to the registry employees. First because certain documents, such as the citations, are not intended to be integrated into *RegSol* by the law, and there is no item foreseen for that matter in the interface at the moment. This forces the Registry to keep these documents in their paper form.

> “I believe that the legislator will have to evolve: there is a gap between the intentions they have in saying that the file will be fully electronic and the reality. They would really have to look at each section of the law and ask themselves what they need to do in order to make it full and only electronic. Because today the legislation doesn't allow it." (Chief of clerk, February 2022, Court Delta)

A second reason is that *RegSol* was not intended to replace any of the tools that already existed (Mougenot, 2017). *RegSol* was conceived additionally to all the many applications that were already used by the commercial courts, increasing their technological redundancy, and entailing parallel–electronic and paper–files.

> “The proposed law does not in fact prevent the maintenance of a double bankruptcy file. In addition to a procedural file (opening and closing of the bankruptcy), there will in fact still be — simultaneously — a bankruptcy file at the court” (Chambre des représentants de

> Belgique, 2017, p. 16)

A third reason is that the court is not sufficiently equipped to work with an electronic file only.

> “Before the pandemic, court clerks had to share computers. We had to wait two years to get laptops and finally allow some homeworking. So much to say that tablets or laptops for consular judges is unthinkable and the courtrooms are not equipped with computers anyway. So, we have to print the file so that everyone can have access to it.” (Registry staff member, January 2022, Court Alpha)

A fourth reason is that consulting a file is faster in paper version than in its electronic version on *RegSol*. This observation is induced by the fluidity and continuity problems mentioned above. This constraint is not negligible and was clearly visible when there is a high volume of cases. If the "big" courts did not operate with a paper version, this difficulty would paralyse proceedings. In a certain sense, *RegSol* was not designed for the courts dealing with large volumes of information and cases.

This observation must be qualified if one considers the point of view of some magistrates:

> "With *RegSol*, it is the first time that we have an electronic file. We click for every operation. With this platform, we have finally managed to dematerialise the court file. It's imperfect, it only works for a specific procedure, but it also has its advantages in terms of mobility, because you no longer have to go and sign: you click; you no longer have to send repetitive and cumbersome letters by post, nor acknowledge receipt: you click; you no longer have to go and find the files, look for the right document and photocopy it: you click” (Magistrate June 2022, Court Alpha).

> “Ultimately, *RegSol* is a handy tool for exchanging data between the curator, the commissioner and the court because you only have to press a button.” (Magistrate, March 2022, Court Beta)

This fairly positive opinion seems to be shared more by young magistrates (under 45) who have started working with *RegSol* and are quite satisfied with it. It also seems that older magistrates, who were familiar with the procedure before the tool was introduced, are the most critical towards

it.[67]

In any case, the electronic file did not replace the paper file, as expected and announced, but it has been added to it (Mougenot, 2017). Yet, article 5/1 of the law of August 8, 1997 on bankruptcies stipulates that the *Register* is an "authentic source." Thus, when the registry and the magistrates handle the paper file, "they give up their authentic source by working on duplicates," as mentioned by one of the Bar Associations' administrators (December 2021). The appellation of "authentic source" might seem strange if one knows that the original signed judgements remain in the paper file at the court. Only unsigned copies are uploaded on *RegSol* (Mougenot, 2017). The Data Protection Commission questioned the legitimacy of the *Register* as an authentic source since it duplicates the file kept in court (Autorité de protection des données, 2016, p. 4). *RegSol* is actually a combination of true certified copies of an original document kept in the paper file at the court (such as the decisions pronounced) and original electronic documents (such as the consular judges' orders). The *Register* can only serve as an authentic source for the latter. The former is included for information purposes only, to allow the person consulting the *Register* to have a complete view of all acts performed in insolvency case. This shows the importance of keeping the file in its two — paper and electronical — formats: "There is a paper part and an electronic part. And some documents exist twice." (Registry staff member, December 2021, Court Alpha).

Currently, a dual and parallel working process exists, as files lead a double existence. It becomes clear that this dual process has duplicated the work of the registry, court clerks having to track the file in both forms simultaneously. The paper versions require a lot of administrative support to be printed, scanned, classified, and recorded manually (Mougenot, 2017). And we have seen that the electronic versions request considerable check and handling backing. This constraint has led to some reorganizing processes, weighing on some — courts — actors more than on others — i.e. lawyers and curators.

7. Conclusion

This article critically analyses the controversies raised by *RegSol*. It reports on the discourse of the actors involved, some of whom are enchanted (having taken an active role) while others are

[67] This nuance that we bring here is the subject of the second part of our ongoing research and will be the subject of a later article.

disenchanted about the tool (unable or unwilling to let their needs to be taken into account). Our study shows that the primary objective of the tool was to make justice more accessible and efficient in commercial courts. This goal, however, is undermined by various issues about data ownership, service continuity and courts' independence from third — and private — parties. These concerns have been gradually revealed by the obstacles encountered in the design, development and implementation process of the tool. These obstacles emerged through the genesis of the platform, and they complicate *RegSol*'s vocation to make justice more efficient and accessible. As such, *RegSol* plays a paradoxical role in insolvency jurisdictions: while giving a remote access to the file and centralizing information and actors, it increases the heterogeneity of non-integrated tools. It also brings new challenges mainly weighting on magistrates, court clerks, and registry employees. While the court practitioners were already reluctant to *RegSol* before its implementation, their aversion worsened after. *RegSol* is currently unable to meet the unspoken needs of court actors, who have to tinker with this new device… and the others. As a chief clerk mentioned, "They are developing a tool that is very well done, but it is not adapted to what we do in the field" (Chief Clerk, February 2022, Court Delta). This, in turn, sheds light on why *RegSol* cannot automatically increase the access to justice, nor its transparency, efficiency, and effectiveness, nor restore societal trust in the judicial system.

However, as it appears, bankruptcy proceeding is both a long and a thick working process. Driven by various actors, procedures and tools, artisanal practices, discussions, deliberations, and negotiations making it difficult to be automated. This complex working context also undermines the ability of any tool to meet the needs of each actor at each stage of the process. This, in turn, could partly explains why different group of actors have conflicting opinions about *RegSol*. Furthermore, it may not be excluded that some implementation issues experienced by the court practitioners are just a consequence of technological insufficiencies.

Finally, this contribution shows the need to reflect on the role of digital tools on/in Justice and on the rule of law it should guarantee (Vanderstichele, 2017b). It also demonstrates that the implementation of *RegSol* involved not only technological but also institutional, organizational and normative factors (Velicogna et al., 2013). Therefore, it is necessary to study technological tools and access to justice as social constructions. Tools are produced in several stages (design, development, implementation) which all involve a variety of stakeholder groups that need to be

interested, *enroled* and *mobilised* beyond their categorical and short-term interests. While the Bar Associations have been successfully *mobilising* most lawyers to use *RegSol*, this tool has rather been contested within the commercial courts, particularly among magistrates and court clerks, who did not participate in its design and development. They opted for an *exit* strategy after *voicing* their discontent, but this did not influence the minister's logic of action. Both their *non-enrolment* and their choice to *exit* impacted on their working practices, as *RegSol* does not meet their specific needs and working context. All of this takes place in a dynamic technological and economical context, where digitalization constitutes both a normative discourse and an opportunity (Dubois & Schoenaers, 2019). In this case, the opportunity reinforced the power of the Bar Associations. Together with their private partners, they became central and indispensable actors for the proper functioning of the courts, which are now dependent on *RegSol*. Without *interessing*, *enrolling*, and *mobilising* court practitioners in the design, development, and implementation of the tool, and without a strategic shift to *loyalty* on their part, the capacity of *RegSol* to increase access to and transparency of justice will remain problematic and controversial. This questions the future of *RegSol*: what will future developments regarding the tool look like? Will it be increasingly used by more and more court practitioners? Will it be adapted to their needs?

CHAPTER 7 — BETWEEN SILOS AND NETWORKS: DIGITAL INFRASTRUCTURES AND RECONFIGURATION OF EXPERTISE IN THE BELGIAN JUSTICE SYSTEM

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Abstract: This article investigates how the introduction of the Mammoet at Central Hosting (*MaCH*) digital case-management system reshapes expertise within the Belgian road traffic criminal justice supply chain. Conceptualizing the supply chain as a multi-level network comprising interconnected yet institutionally distinct actors, the study draws on Actor-Network Theory (ANT) and boundary work perspectives. It employs a qualitative, multi-case approach to analyse how *MaCH* mediates professional practices among judges, prosecutors, clerks, and technologists. Findings reveal that *MaCH* significantly streamlines administrative tasks before and after court hearings, redistributing responsibilities and prompting shifts in professional expertise boundaries. Judicial professionals strategically adopt a "protective connectedness" approach, balancing collaboration with boundary protection to preserve core expertise and maintain control over critical decision-making processes. Ultimately, the article contributes to understanding digitalization's complex role in reconfiguring professional expertise in supply chain judicial contexts.

Keywords: digital infrastructures; networks of expertise; ANT; boundary work; protective connectedness; public sector supply chain

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1. Introduction

For two decades now, modernization of public administrations through digital transformation has been at the top of the European political agenda (European Commission, 2008, 2019; European Commission for the Efficiency of Justice (CEPEJ), 2020). This is particularly true for the judicial sector, which is notorious for its resistance to change. Once known for their ritualistic reliance on tradition, paper documentation, and autonomous professional discretion, the justice system is increasingly integrating technological solutions to meet rising demands for efficiency, transparency, and interoperability (Bastard & Dubois, 2016; Schoenaers, 2021; Whalen, 2022). Within this shifting landscape, this article analyses the adoption of the *MaCH* tool, a platform meant to centralize digital case-management in Belgian criminal justice system. More than a mere technical innovation, *MaCH* functions as a socio-technical artifact: it mediates not only administrative practices but also the complex professional relationships, boundaries, and forms of expertise that underpin daily judicial practices.

More specifically, this article investigates how *MaCH* reshapes the Belgian road traffic criminal justice chain. This chain is analytically approached as a public sector supply chain (Blok et al., 2015; Callender, 2011)**.** Such a conceptual framework offers insights into how practices circulate among interdependent actors and reconfigure expertise. Public sector supply chains are defined as networks of governmental organizations that work collaboratively (Noordegraaf, 2016) to deliver public services to citizens (Ambe, 2012). Within this logic, the Belgian road traffic criminal justice chain — comprising police services, public prosecutors, and police courts — can be seen as a multi-level, inter-organizational system that collectively ensures the enforcement of traffic laws and the administration of justice. Like in other public service domains, each actor in this chain performs distinct but interconnected work, where the output of one institution often becomes the input for another, making the chain reliant on efficient coordination, information exchange, and continuity of workflows across organizational boundaries (Seepma et al., 2021; Yang & Maxwell, 2011).

Yet, unlike typical private-sector supply chains, the criminal justice chain is embedded in a *tria politica* (Montesquieu, 1989) constitutional framework, which imposes structural separations between the executive, judiciary, and legislative branches. This legal design preserves

independence but often hampers integration and interoperability, producing siloed operations that are poorly equipped to manage high-volume, cross-cutting processes like road traffic enforcement (Ponsignon et al., 2011). This creates a unique paradox: although the system must operate cohesively to deliver justice, its legal and institutional foundations inherently promote fragmentation. To address this structural disconnection, digital case management tools were introduced to bridge the divide between organizational autonomy and the need for operational coordination. It is within this logic that *MaCH* was deployed in 2007, positioned as a key digital solution to counteract longstanding "inefficiencies" (Wynsdau & Jongen, 2015). More than a technical upgrade, *MaCH* formed part of a broader strategy aimed at standardizing information flows, simplifying administrative tasks, and enhancing collaboration across the various institutions involved in processing road traffic offenses (Service public federal Justice, 2019).

The central research question guiding this study is: How does *MaCH*, as a socio-technical artifact, mediate boundary work through everyday practices to reconfigure networks of expertise in Belgium's road traffic criminal justice system? Rather than treating *MaCH* as a neutral tool for automation, we approach it as a mediator that both shapes and is shaped by evolving professional practices. Specifically, we examine how *MaCH* enables — or constrains — interactions between all the human and non-human actors of the supply chain. These interactions have implications for the allocation of practices, leading to jurisdictional claims and the reconfiguration of networks of expertise.

To investigate this question, the article draws on ANT (Akrich et al., 2006; Latour, 2005) and scholarship on boundary work (Gieryn, 1983; Lamont & Molnár, 2002; Langley et al., 2019; Phillips & Lawrence, 2012). These frameworks allow us to consider *MaCH* as an agentive artifact that co-constitutes expertise through everyday interactions with judicial professionals. ANT provides the conceptual tools to understand expertise as a distributed network effect — a product of assemblages involving human actors (judges, prosecutors, clerks, registry staff members), non-human actors (*MaCH*, files, case codes, templates), and socio-material practices (coding, validating, interpreting). Simultaneously, the lens of boundary work highlights how professionals strategically defend, negotiate, and reconfigure the symbolic and practical limits of their expertise when confronted with technological and organizational changes (Abbott, 1988; Allen, 1997; Faulconbridge et al., 2021). Stepping from a singular, profession-centric expertise (Eyal, 2013;

Petrakaki et al., 2012) towards a collaborative and interdisciplinary approach (Elmholdt & Elmholdt, 2017), we suggest that forms of expertise need to be assembled and integrated by the performance of certain work practices. Through these combined perspectives, we explore how expertise is not only practiced but continuously restructured in a digitally mediated environment.

Our study employs a multi-case research design (Yin, 2009) to capture the nuances of these transformations across contrasting jurisdictions in Belgium (see below, section 2.2). By examining everyday practices before, during, and after court hearings, we trace how *MaCH* reshapes workflows, reallocates responsibilities, and influences inter-organizational collaboration and negotiations. This methodological approach allows us to uncover the intricate interplay between digital tools and human agency in the emergence and redistribution of expertise**.**

This paper makes three contributions. First, while research on digital justice often frames automation as the primary outcome of technological change (Susskind & Susskind, 2022), our analysis reveals a nuanced process of learning, adaptation, and redefinition of professional practices. Second, whereas studies of supply chains typically emphasize performance metrics (Karwan & Markland, 2006; Venkatesh et al., 2012), we focus instead on how professional groups navigate the integration of technology like *MaCH*. Third, we highlight the inter-organizational dynamics involved in *MaCH*'s implementation, complementing existing research that has largely examined either single-organization digitization or citizen–government interactions (Lindgren & Jansson, 2013).

2. Context and methods

To situate our analysis, we begin by outlining the institutional and reform context in which *MaCH* was introduced, before turning to the methodological approach that guided our study.

2.1. Belgian judicial system and the MaCH reform

Belgium's justice system is embedded in a complex federal state structure (Uyttendaele, 2017). At its core lies the constitutional principle of *tria politica*[69] — the separation of powers (Montesquieu,

[69] *Tria politica* refers to Montesquieu's theory of the separation of powers into legislative, executive, and judicial functions. In the Belgian context, it prohibits the executive from issuing injunctions or directives to judges, ensuring judicial independence while shaping the institutional boundary between police, prosecutors, and courts.

1989) — which distributes legislative, executive, and judicial authority across distinct bodies. In practice, this involves the police as part of the executive, the public prosecutor's office — which straddles both the judiciary and the executive — and the courts, which exercise judicial power. Each operates independently, preventing executive bodies from issuing injunctions or directives to the judiciary. Within this framework, the term "magistrates" refers both to seated magistrates (judges) and standing magistrates (members of the public prosecutor's office). Judges enjoy full independence in adjudication (Constitution, Art. 151, Moniteur Belge, 1994); while prosecutors, though hierarchically organized under the Minister of Justice, retain autonomy in handling individual cases (de Leval & Georges, 2010). The system is also marked by linguistic fragmentation. French-speaking Wallonia and Dutch-speaking Flanders share a unified judiciary, yet everyday practices, coordination styles, and modernization rhythms often reflect historical–linguistic distinctions. Digital reforms therefore must accommodate divergent institutional traditions, professional cultures, and infrastructures. Every initiative is scrutinized through the lens of community interests, reflecting the consociational character of Belgian democracy and the compromises it requires (Vigour, 2018).

From the late 1990s onwards, Belgium's judiciary, like many across Europe, entered a phase of accelerated modernization. Crises of legitimacy and growing demands for accountability opened windows of opportunity for reform, and New Public Management (NPM) principles — aiming to enhance public sector efficiency by adopting management strategies commonly used in the private sector (Schoenaers, 2015) — were mobilized to rationalize judicial work, introducing benchmarks, scorecards, and performance contracts (Contini & Mohr, 2007; Vigour, 2004). Over time, these managerial reforms have increasingly been supplemented — and sometimes supplanted — by digital infrastructures (Cappellina, 2018; Contini & Fabri, 2001; Dumoulin & Licoppe, 2011). Belgium's trajectory is consistent with broader European trends: in France, for instance, the *Cassiopée* system has been deployed across criminal courts (Féry, 2015), while Italy's *Processo Telematico* has progressively restructured civil justice (Fabri, 2009). The *MaCH* case management system exemplifies this wider movement: it is part of a longer history of attempts to rationalize judicial work through managerial and technological tools, progressively reshaping judicial organization and practice.

Launched in 2007, *MaCH* is a modular case-management system initially introduced in district courts and later extended to police courts[70] and prosecutors' offices. Its purpose is to manage data on a single centralized server and provide a reliable digital standard with a focus on supporting the administrative work of practitioners and converting physical flows of information into digital flows (Service public federal Justice, 2019). *MaCH* is primarily an internal administrative tool: clerks and register staff use it for data entry and document production (e.g., hearing reports, judgments, certificates of driver's license withdrawal), while magistrates tend to use it mainly for consultation purposes. Importantly, *MaCH* does not possess decision-making capacities and is not intended for public information sharing; rather, it functions as a technological node that facilitates standardized data exchanges. While initiated by the federal executive, its development and maintenance were entrusted to the AX'OP consortium — a partnership between the French companies Axi and Open — illustrating that *MaCH* is not solely a state-led reform but also the outcome of public–private collaboration (Conseil des ministres, 2008; Conseil Supérieur de la Justice, personal communication, 30 June 2020). These design and maintenance choices reflect a hybrid governance arrangement that highlights the sociotechnical features of *MaCH* and anticipates the institutional tensions explored in later sections. At the same time, its deployment was not a frictionless process. Its rollout was conditioned by existing organizational structures and professional cultures, which both enabled and constrained its integration.

2.2. A case study methodology

This contribution applies a case study approach to facilitate an in-depth understanding of the influence of the *MaCH* tool on how network of expertise redesign and react within the road traffic criminal justice supply chain in Belgium (Yin, 2009). Two case studies were performed within two contrasting jurisdictions (Beta and Epsilon): they differ in terms of size, language regime (French and Dutch), population density, and geographical scope. Both switched to *MaCH* between 2007 and 2009. Rather than aiming at cross-case comparison, the study seeks to illuminate how digital infrastructures unfold across diverse institutional contexts. Each case provides a situated

[70] In Belgium, the Police Court is a first-instance court with both criminal and civil jurisdiction in road-traffic matters. Criminal competences include traffic offences (e.g., hit-and-run, drink-driving) and related contraventions; civil competences include compensation claims following road or rail accidents. In addition, it has jurisdiction over disputes relating to football matters over the recovery of administrative fines. Police-court hearings are presided by a judge (assisted by a clerk), with a representative of the public prosecutor's office present. This paper focuses on the criminal side.

perspective on the interaction between professional practices, organizational constraints, and technological affordances. Taken together, they allow for a nuanced and multi-faceted understanding of judicial digitalization, attentive to local particularities. This research draws on qualitative methodology. It is primarily based on on-site observations (n = 11) and, confidential and anonymous individual semi-structured interviews conducted with people directly concerned by this subject (n = 24), between September 2022 and December 2022. Interviews were conducted in French and Dutch and subsequently translated into English for the purpose of this article. While preserving anonymity, interviewees can be grouped as follows: judges and court presidents (n = 5), prosecutors (n = 3), clerks and registry staff (n = 12), IT staff (n = 2), and lawyers (n = 2). Of these, nine interviewees had direct experience of both the "before" and "after" of *MaCH*'s introduction, while the others were hired after its implementation and only knew the system as established practice. As the police are not users of *MaCH*, they were not included in the case studies. Every interview provided both a descriptive account and a meaningful interpretation of the interviewees' working experience and context. A thematic content analysis was then carried out using Corpus©.[71] Corpus is a free open-source software developed by the University of Liège. It enables thorough and detailed qualitative thematic analysis (Braun & Clarke, 2006) across various document types such as case law, interviews, focus groups, and press articles. This capability is made possible by its sharing, labelling and multilevel tagging systems. In addition to this empirical material, grey and scientific literature reviews were conducted. Simultaneously, web and documentary searches were executed in order to collect "managerial discourse" relating to *MaCH*, including online publications as well as policy documents, technical manuals, minutes drawn up by the federal public service of justice, blog posts, interviews in the press, and posts on LinkedIn.

3. Theoretical frameworks

As digital technologies become embedded in professional fields, prior research suggests they can alter how expertise is constructed, mediated, and exercised. In the criminal justice system, tools such as *MaCH* are therefore best approached not only as administrative supports but as elements that may interact with the very fabric of judicial practice (Latour, 2005). We use ANT and

[71] https://corpus.lltl.be

boundary-work perspectives as conceptual lenses to examine how expertise can be understood as a distributed, performative network effect in which human actions and digital tools co-constitute practices. These lenses guide our analysis and frame the questions we investigate about efficiency, accuracy, and justice in contexts where digital tools interact with professional work.

3.1. A new form of hybrid professionalism

Scholars in sociology of professions have long distinguished between different *models of professionalism* — that is, distinct ways of organizing and legitimizing professional authority. The first is occupational professionalism (Freidson, 2017), which emphasizes autonomy, collegial authority, and jurisdictional control (Abbott, 1988). In this model, legitimacy derives from specialized knowledge and a shared professional ethos. Magistrates have traditionally embodied this form of professionalism: their authority rested on interpreting complex legislation, exercising discretion in case management and sentencing, and drawing legitimacy from both specialized legal expertise and support from institutional associations. By contrast, organizational professionalism (Evetts, 2011) arises when professional work is structured by managerial logics and bureaucratic forms of accountability. Here, authority is exercised not through collegial self-regulation but through external oversight, standardized procedures, and performance metrics. While occupational professionalism relies on trust in expertise, organizational professionalism relies on rational-legal authority and measurable outputs. These two models are best understood as ideal types rather than mutually exclusive realities: in practice, professional work often combines elements of both, with their relative weight shifting over time.

In public administrations, the balance between occupational and organizational logics has been unsettled by the convergence of managerial reforms (Bastard & Dubois, 2016; Schoenaers, 2021; Vigour, 2008) and digitalization (Garapon & Lassègue, 2018). This confluence is especially pertinent in institutions historically anchored in tradition and autonomy, such as courts and prosecution services. Professionals who once relied heavily on exclusive jurisdiction now face more pressures to standardize work, use performance metrics, and integrate digital tools into routine practice. These shifts prompt a rethinking of how expertise is practiced and recognized. Yet traditional values persist: judges and prosecutors continue to hold core legal authority — interpreting the law, assessing evidence, and making binding decisions — functions that remain

symbolically and practically central to their work. The coexistence of these pressures takes the form of what Noordegraaf (2007, 2015) terms hybrid professionalism. In this hybrid landscape, occupational autonomy persists but frequently collides with organizational imperatives (Evetts, 2011). As we show in empirical sections, case-management infrastructures can provide a salient site in which such hybridity is enacted.

3.2. Networked and practices-based perspective on expertise reconfiguration

Within this context, expertise has become an increasingly contested terrain. In classical approaches, expertise is closely tied to professions, typically defined by formal training, ethical codes, and jurisdiction over specific tasks (Abbott, 1988; Freidson, 2017). Abbott, in particular, conceptualizes professions as competing for *jurisdictions* — that is, control over specific tasks and responsibilities.

While this tradition highlights how professional boundaries are drawn and defended, it pays less attention to how expertise is enacted in practice and mediated by material conditions. To address this, more recent approaches shift the focus from bounded jurisdictions to the relational processes through which expertise is produced and sustained. Eyal (2013), for instance, conceives expertise as a distributed and performative effect that emerges from interactions between human and non-human actors. From this perspective, expertise is not confined to individuals but reflects the collective capacity to perform work effectively, shaped and reinforced through practices, artifacts, and professional socialization. This view is anchored in ANT, emphasizing that expertise is mediated by artifacts, texts, and routines. It shows how artifacts themselves shape the possibilities of action and interaction, thereby participating in the stabilization of what counts as expertise. From this angle, technologies such as *MaCH* are active participants in the shaping of expertise. This lens foregrounds what is called “networks of expertise”: dynamic assemblages of human and technological actors whose coordinated actions sustain authority and knowledge (Elmholdt & Elmholdt, 2017; Eyal, 2013).

Building on this networked understanding, we adopt a practices-based perspective that locates expertise in the routine actions and interactions of professionals. As digital tools become

embedded in everyday work, they reshape how tasks are distributed, how collaboration unfolds, and how professional boundaries are maintained — or redrawn. Petrakaki *et al.* (2012), for example, show how digital infrastructures in healthcare reconfigure professional hierarchies by redistributing tasks across occupational lines. This underscores that expertise is less about singular, profession-centric authority and more about collaborative and interdisciplinary coordination. From this perspective, digitalization is not an external influence on professional work but a constitutive force, simultaneously shaped by and shaping institutional logics and human decisions.

Finally, while Abbott (1988) already identified the emergence of paraprofessionals as part of jurisdictional shifts, digital tools pushes this phenomenon further. From a practice-based and ANT perspective, these new figures are co-constituted with digital infrastructures themselves. Research in healthcare, for example, shows how electronic prescription systems have enabled technicians and internet-based dispensers to assume tasks once central to pharmacists. Such cases illustrate how expertise circulates beyond established professional domains, filling gaps and challenging boundaries. They also show why expertise must be understood as a relational and situated accomplishment rather than a fixed property of traditional professions. These dynamics do not signal straightforward deprofessionalization or reprofessionalization but reflect a broader reconfiguration of practices, where technology, organizational demands, and professional norms jointly reconfigure the conditions under which expertise is enacted and recognized (Petrakaki et al., 2012).

3.3. Pushing the frontiers of boundary work

To explore shifting dynamics in professional expertise, this article draws on boundary work. Initially introduced by Gieryn (1983) to describe strategies distinguishing science from non-science, the concept has since expanded to capture the intentional efforts — both individual and collective — that shape the social, symbolic, material, and temporal boundaries defining groups, occupations, and organizations (Lamont & Molnár, 2002; Phillips & Lawrence, 2012). Over the past decades, boundary work has been applied at multiple levels, from individuals to institutions, with studies drawing on discursive and practice-based approaches and developing typologies that map the diverse forms, triggers, and outcomes of boundary negotiation (Langley et al., 2019).

A central distinction in this literature is between competitive and collaborative perspectives. Competitive boundary work highlights how actors defend or contest jurisdictions to assert authority, as in Abbott's (1988) account external forces — particularly technological change — reshuffling professional domains. Collaborative perspectives instead examine how groups, occupations, and organizations negotiate, align, or even soften boundaries to achieve shared goals. A number of studies within this stream focus on how technological innovation reconfigures everyday interactions and relationships among collaborating groups or domains of knowledge (Apesoa-Varano & Varano, 2014; Barrett et al., 2012), with particular attention to the role of materiality in shaping these negotiations (Kellogg et al., 2006).

Despite these insights, the literature presents several limitations. First, few studies adopt a fully practice-based perspective that views boundaries as continuously enacted through everyday interactions (Kaplan et al., 2017; Levina & Vaast, 2005). Second, the role of material agency has often been sidelined, despite exceptions showing how technologies actively shape negotiations (Kaplan et al., 2017). Third, most empirical work focuses on dyadic encounters (e.g., between doctors and nurses (Allen, 1997)); overlooking the ripple effects of boundary negotiations across wider networks. Finally, competitive and collaborative dynamics are often treated separately, even though in practice they are deeply intertwined: actors frequently collaborate strategically and deliberately in ways that simultaneously protect their own authority (Langley et al., 2019). To address these gaps, we adopt a practice-based and ANT perspective that foregrounds the role of routine work and the interplay of human and non-human actors in shaping and stabilizing networks of expertise. This approach also expands the focus beyond interactions between only two professional groups to encompass the wider constellations of actors involved in boundary negotiations. Within this broader framework, we use *protective connectedness* (Faulconbridge et al., 2021) as a specific lens to capture how competition and collaboration are entangled, showing how professionals simultaneously safeguard their core jurisdiction while engaging in cross-boundary cooperation in response to organizational and technological change.

3.4. The "protective connected" strategy

We mobilize protective connectedness to conceptualize how collaboration is often driven by defensive strategies: professionals protect their domain by retaining tasks seen as most valuable or

requiring the highest expertise, while simultaneously inventing new practices that reinforce their distinctiveness (Faulconbridge et al., 2021). One common strategy is the delegation of selected tasks to practitioners of lower status, thereby reaffirming hierarchies and preserving core expertise (Noordegraaf, 2020).

Boundary work, in this sense, becomes a way of managing power asymmetries rather than eliminating them (Strauss, 1988). As studies in healthcare show (Allen, 1997; Apesoa-Varano & Varano, 2014), flexible and often informal accommodations between groups frequently go unacknowledged and are never formally legitimized, even though they play a vital role in sustaining collaboration. Ironically, these subtle practices may reinforce rather than challenge hierarchical structures, despite their value for organizational efficiency and cooperation. In the empirical sections, we use this lens to examine how protective connectedness is enacted around *MaCH* in the justice domain.

Drawing on these insights, we propose a revised understanding of boundary work — one rooted in practice theory, attentive to entangled human and technological agency, and centred on interactional forms of expertise. Building on Langley et al. (2019), we define boundary work as the purposeful, networked effort to reconfigure the practices through which the boundaries of expertise are enacted and sustained. This definition anchors our empirical analysis.

4. The complexity of the road traffic criminal justice supply chain: From challenges to the digital imperative

The road traffic criminal justice system can be conceptualize as a public service supply chain composed of multiple organizations that collectively ensure the rule of law (Seepma et al., 2021, p. 421). Police, prosecution services, and courts operate as successive yet interdependent links in this chain, working together to deliver justice and safety as public services to citizens and society (Blok et al., 2015; Callender, 2011), as shown in Figure 10.[72] Hence, public service delivery in criminal justice is increasingly understood as a collaborative process involving multiple institutions (Noordegraaf, 2016). Like other public service supply chains, this network is characterized by organizational diversity, complex responsibilities, and dense layers of regulation,

[72] The police are represented as part of the supply chain but without associated professional groups, since they were not included in *MaCH*'s rollout.

all of which constrain the integration of processes across institutions (Ambe, 2012). These constraints often hinder the development of strategic inter-organizational partnerships and make coordination among all parties involved in service delivery a central challenge (McCue & Pitzer, 2005). Police, prosecution services, and courts collaborate daily in road-traffic cases, but they remain embedded in distinct organizational domains and professional logics, with their own workflows, standards of practice, and data systems (Service public federal Justice, 2019). This structural separation of institutions, rooted in constitutional principles, continues to shape coordination today.

Prior to *MaCH*, this organization fragmentation was further reinforced by technological disconnection: each institution relied on its own case-management system, typically non-interoperable. As a result, professional practices developed in relative isolation, and information exchange between institutions was often slow and incomplete (Wynsdau & Jongen, 2015). Practitioners themselves described this experience in terms of "silos." As one police court judge explained, "we worked in silos: each institution sees only its own part of the case, and without a common system it was very difficult to connect our work with that of others" (Police court judge, December 2022, Court Epsilon). This testimony underscores that silo-ing was not only raised in reform discourses seeking to modernize and standardize judicial processes but also constituted a lived frustration within the judiciary, where partial visibility reinforced fragmented practices and complicated coordination across organizational boundaries. These siloed practices reflected the regulatory and operational constraints of each institution, and it also generated persistent inefficiencies and inconsistencies across the justice chain that "was not optimal for the collaborative demands of criminal justice" (Prosecutor, December 2022, Court Epsilon). As another prosecutor recalled, the absence of a shared platform "severely hindered both operational efficiency and inter-organizational collaboration" (Prosecutor, October 2022, Court Beta). The statement highlights the normative expectation of coordination, against which pre-*MaCH* practices were judged inadequate.

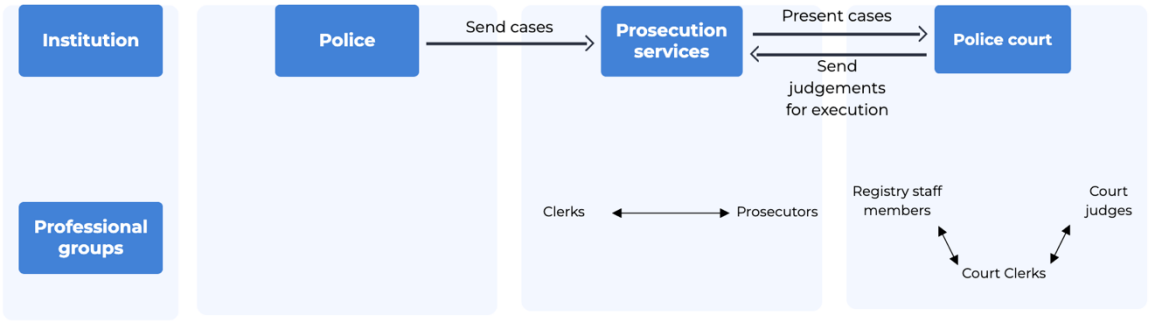

Figure 10. *The institutions and professional groups involved in the road traffic criminal Justice supply chain*

In response to these challenges, *MaCH* was introduced in 2007 by the executive branch to modernize judicial workflows (Service public federal Justice, 2019). Its initial rollout was prioritized in the road-traffic justice supply chain for two main reasons. First, this domain requires especially efficient coordination, as police, prosecutors' offices, and courts must work together to bring cases to trial. In such a complex, multi-level network — subject to strict requirements for privacy, confidentiality, and authenticity — robust information exchange is not just advantageous but indispensable (Seepma et al., 2021; Yang & Maxwell, 2011). Second, road-traffic litigation represents one of the highest-volume sectors of judicial activity. Governed by detailed legislation and standardized procedures, it offers a particularly favourable terrain for digital integration (Ponsignon et al., 2011). It is important to note that by entrusting development to the AX'OP private consortium, public authorities introduced an external actor into the justice chain, whose design decisions would structure future workflows.

Although the police are integral to the criminal justice supply chain, they were excluded from *MaCH*'s implementation because, under the Belgian Constitution's *tria politica* principle, they fall under the executive rather than the judiciary. Yet they remain key actors, operating their own case management system (*ISLP*), which is interoperable with *MaCH* and allows information to circulate across institutional boundaries. This interoperability underscores the interdependent nature of the justice network: as one police court judge put it,

> "We are really just one link in the chain, and each link only has a partial view. *MaCH* was designed to ensure that the chain unfolds smoothly and that everything communicates. Encoding takes place at all levels, and information is shared with key partners, such as

> the police and other federal agencies." (Police court judge, November 2022, Court Epsilon).

Against this backdrop, the analysis focuses on prosecution services and police courts as the primary users of *MaCH*, while recognizing their embeddedness in a broader supply chain.

5. How *MaCH* reshapes judicial practices differently across procedures

This section presents the mediation and transformative influence of *MaCH* on the practices within the road traffic criminal justice system. Our findings reveal that *MaCH*'s most significant benefits occur in the pre-hearing and post-hearing phases — when clerical and administrative tasks are most time-consuming. These new practices free judicial actors to focus on higher-level tasks and complex legal matters.

5.1. *MaCH* as a streamliner of pre-hearing and post-hearing practices

Most stakeholders note that *MaCH*'s primary benefits occur before and after court hearings, when clerical and administrative tasks are most time-consuming. By automating key work practices, *MaCH* facilitates:

- *Data integration and automatic transfers*

MaCH automates the transfer of police data (from *ISLP*) into a single, trackable file shared between the police, prosecution, and court. Each case is assigned a unique number that links related judgments and files. If any connections exist between cases, these links are also recorded. This automation significantly reduces manual entry, helping clerks assemble files faster and enabling prosecutors to quickly check for repeat offenses, by automatically linking earlier judgments to new cases.

> "I still knew the time when, here, at the public prosecutor's office, all the information relating to the criminal records was on cards […]. For each defendant, we had to manually look up if there was a card and note, by hand, on a sheet of paper, the information. Now it is way easier." (Prosecutor, October 2022, Beta Office)

- *Bilateral exchange between prosecution and courts*

With both the prosecution and the courts using *MaCH*, documents like charges and judgments are automatically exchanged throughout the process. Depending on the stage of the procedure, data is seamlessly transferred from one entity to the other: courts receive preliminary file details from the prosecution prior to hearings, and the prosecution receives court judgments once issued. Before *MaCH*, registry staff members manually re-entered or transferred data from paper files into their own case management system. Now, each party accesses a complete electronic case file, with all actions logged. This integration streamlines workflows by eliminating duplicate data entry and manual file transfers.

> "We can reopen documents, print them out, and email them. So, there is a series of information that is quite valuable. For example, if I want to see if an offense is subject to aggravation, I just check *MaCH* and read the previous verdict rendered by the court. It's much easier and faster than requesting the judgment from the clerk's office (by putting a post-it note on the paper file), waiting for it to be printed and sent to us." (Prosecutor, October 2022, Beta Office)

It illustrates how *MaCH* directly addressed coordination bottlenecks by replacing sequential, paper-based exchanges with shared digital access. At the same time, this shift reconfigures inter-professional relations: tasks once mediated by clerks have become directly accessible to prosecutors. What is often described as convenience, therefore, also implies a reallocation of responsibilities within the chain.

- *Automated document generation*

Last but not least, *MaCH* allows the automatic generation of documents based on the data entered. The best example to illustrate this ability is the automatic production of judgements in routine road-traffic cases from pre-coded templates. Sentences relating to road traffic matters are relatively enclosed by the Belgian Road Traffic Police Law (1968). Therefore, *MaCH* contains a number of codes which each correlate to a standardized motivation. Court clerks simply select relevant legal references, and the tool produces a formatted judgment — saving substantial typing and formatting

time. This is particularly useful for "bench" verdicts, where decisions are pronounced immediately during the hearing and do not require particular motivation or justification.

> "The judgment will automatically come out with the correct standard motivation. For cases that don't require any particular thought or questions to be answered, it's really handy. It's a huge time saver because, before, you had to type in the identity of all the parties, insert the magistrates' motivation and re-state the facts." (Court clerk, September 2022, Beta Court)

Beyond highlighting efficiency, this quote illustrates how *MaCH* embeds standardized reasoning into judicial workflows. Automation of routine formulations reduces repetitive manual work, but the automation of "standard motivation" also signals a redefinition of clerk's contribution shifting part of judicial writing into the domain of system-supported administration. However, observations showed that clerks frequently adjust these templates slightly to reflect the judges' preferences and to account for the court's way of doing things. This practice is more visible in Wallonia than in Flanders, because judges seem to be more attached to their writing autonomy, leading to some regional variation in judgment style. These small but systematic adaptations illustrate how professionals, in turn actively shape the deployment of *MaCH.*

As shown in Figure 11, *MaCH* serves as an organizing node that redefines administrative tasks previously dispersed across manual processes. By automating and consolidating data flows, it redistributes responsibilities between human and non-human actors, allowing clerks to fine-tune standardized documents and enabling prosecutors to quickly trace repeat offenses — thus reinforcing a managerial logic that values speed and standardization.

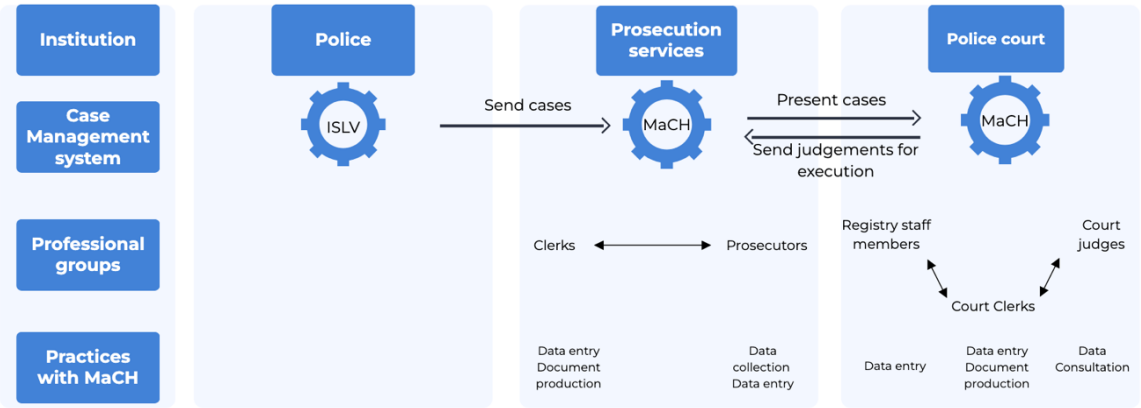

Figure 11. *The road traffic criminal Justice supply chain with the introduction of MaCH*

5.2. The hybrid practices within courtroom

During courtroom hearings, the reliance on *MaCH* often diminishes. Observations and interviews indicate that paper files and physical annotations continue to dominate the actual court sessions for several reasons:

- *Pragmatic affordances of paper*

Many judges and clerks find that paper files offer a quicker and more intuitive means for on-the-spot referencing and annotation. As one judge explained,

> "In the paper version, we can find what we are looking for much more easily compared to scrolling through pages on the screen. We have the file spread out in front of us and can directly locate the document and make notes." (Police court Judge, November 2022 Court Epsilon).

Here, resistance is framed less as outright rejection and more as an articulation of material affordances. Paper is valued for its visibility and tangibility, underscoring how older artifacts continue to stabilize professional routines even as digitalization advances. While *MaCH* improves speed and standardization, it also introduces new frictions compared to the analogue circulation of paper files, which — even if slower — allowed more flexible access. Further observations of court

hearings suggest that *MaCH*, as a digital tool, does not fully integrate into the practices of the courtroom, where physical files remain deeply embedded in traditional rituals.

- *Digital distrust*

Some judges express scepticism about relying exclusively on digital systems:

> "Keeping a paper record or being able to work manually can be an advantage rather than relying entirely on digital systems. You never know if the software malfunctions, and then the justice system would be completely paralysed. So, it involves risks." (Police court judge, October 2022, Court Beta)

Here, resistance is articulated as a pragmatic strategy of risk management. Digital infrastructures, while efficient, are seen as fragile; maintaining paper is thus a way to safeguard professional autonomy against technological breakdown. This wariness further limits the digital system's adoption during hearings.

- *Legal constraints and symbolic practices*

As one court clerk mentioned, "For reasons of authenticity and notification, the law mandates that certain documents must exist in their original paper form."[73] (Court clerk, September 2022, Beta Court), so fully digitalizing the hearing process is not yet feasible. Clerks must therefore maintain both electronic and physical files — ensuring continuity while meeting formal legal requirements. Beyond practicality, paper holds symbolic value, reinforcing judicial authority and long-standing practices tied to tangible documents. This suggests that *MaCH* has not fully displaced the established "actants" (paper files, in-court routines) that reaffirm judicial independence.

This dual system — where digital files coexist with mandatory paper originals — creates tension between digital efficiency and the preservation of judicial independence and legal tradition (Evetts, 2011). Paper originals act as structural constraints, limiting *MaCH*'s transformative reach. Courts,

[73] For example, for introductory applications, the adversarial application must still be lodged at the registry or sent by registered mail in its original paper form for new cases (Code Judiciaire, 1967, Articles 1034bis–1034ter). Furthermore, the minute of the judgment and the hearing sheet to which the minute is annexed are also kept as the authentic originals on paper (Code Judiciaire, 1967, Articles 783, §§2–4). Although CJ art. 783, §§2–4 permits an electronic original provided it is executed with a qualified e-signature, e-signature workflows are not yet deployed in police courts. Registries therefore continue to keep the minute and the hearing sheet on paper.

clerks, judges, prosecutors, *MaCH*, and paper documents form a network in which each actor shapes the others. Yet interviews show uneven engagement with digital tools, highlighting *MaCH*'s still-incomplete enrolment into the hearing "network."

In summary, while *MaCH* partially redefines how road-traffic cases are processed, acting as a mediator of pre- and post-hearing activities, it does not significantly alter the immediate practices within the courtroom. Its agency remains circumscribed by strong cultural and legal practices and real-time constraints that elevate paper-based methods during court hearings. The result is a hybrid system where digital processes coexist with, rather than replace, traditional analogue methods.

6. Reconfiguring the network of expertise

MaCH's capacity to automate administrative tasks and streamline information exchanges has liberated judicial actors from repetitive chores, thereby creating space for higher-level work. In this section, we delve deeper into how *MaCH*, as an active technological participant, reconfigures the networks of expertise among prosecutors, judges, court clerks, and registry staff. In this sense, we are not tracing the boundaries of professional categories per se but observing how professional boundaries of expertise are negotiated through evolving practices.

6.1. Shifting boundaries of expertise between professional groups

By co-shaping and redistributing work practices alongside human agents, *MaCH* enables strategic boundary work that allows higher-level professionals to concentrate on complex legal matters while preserving essential oversight and control over judicial outcomes (Kellogg et al., 2006; Strauss, 1988).

- *Clerks and registry staff "up-ranked"*

By taking over or automating low-value, manual duties — such as encoding data multiple times — *MaCH* allowed clerks to assume a more "up-ranked" set of responsibilities previously carried out by magistrates. Notably, on the prosecution side:

> "The employees on the police prosecution service now prepare the direction of the file, they already suggest a course of action: either to close the case, or to settle it, or to send

> the file directly to the court hearing. They now have a job of legal qualifications. And we, as prosecutors, validate, we check that the work has been done properly." (Prosecutor, October 2022, Beta Court)

These newly up-skilled clerks find the work more rewarding. They now collate outputs, produce early-stage analysis and present them to more expert professionals: prosecutors. Meanwhile prosecutor deputies can increasingly act as supervisors of the work clerks provide. The power to validate or veto these assessments remains squarely with the magistrates. Hence, part of the prosecutor's strategy is to focus on compliance and oversight. As Tsingou (2018) argues about anti money laundering professionals, they not only monitor "but, to protect their interests, also shape the content of governance" (p. 191). New practices do not necessarily challenge entrenched hierarchies (Strauss, 1988); here, boundary work means that magistrates effectively delegate tasks they deem routine, preserving their own jurisdiction and expertise over final, legally binding decisions.

- *New work practices for prosecutors*

Alongside delegating simpler cases to clerks and registry staff members, prosecutors now devote themselves to more intricate cases:

> "There are cases that require more preparation and more investment, such as fatal accidents, where the requisitions are longer and more complete, because there is more at stake regarding to the offences that have been committed. There are also legal subtleties that the employees don't necessarily master, in particular everything that concerns aggravations." (Prosecutor, December 2022, Epsilon Court)

They also operationalize criminal mediation: "It constitutes an alternative to prosecution. It has the advantage for the person of not having a mark on their criminal record but still having a sanction or a reminder of the law" (Prosecutor, October 2022, Beta Court). Under Article 216ter of the Belgian Code of Criminal Procedure (Code d'instruction Criminelle, Art. 216ter, Moniteur Belge, 2005), the public prosecutor may propose mediation for offences not appearing to warrant more than two years' principal correctional imprisonment; the procedure is voluntary and requires the parties' agreement. Typical measures include compensation, road-safety training (up to 120

hours), or community service (up to 120 hours); if the measures are fulfilled, the public action is extinguished. In traffic matters, prosecutors often contact individuals to discuss appropriate alternatives — ranging from general road-safety courses to targeted programs when alcohol or narcotics are involved. By freeing time, *MaCH* allows prosecutors to actively make use of criminal mediation, a mechanism that already existed in law but was previously underused due to time constraints.

This expansion into alternative pathways reflects protective connectedness (Faulconbridge et al., 2021): prosecutors preserve and enhance their professional domain by determining which issues merit attention, outlining the necessary work, designating qualified and accountable personnel, and assuming responsibilities that demand higher expertise — thereby reinforcing the distinction between themselves and clerks. In accordance with boundary work theory, they redefine jurisdictional limits by focusing on complex tasks and governance issues and by using their specialized knowledge as a barrier against external interference. This strategy not only preserves their professional authority (Abbott, 1988) but also ensures rigorous compliance oversight of the delegated tasks (Tsingou, 2018).

- *Judge–clerk collaboration: the "cabinet system"*

Within courts, judges and clerks increasingly function as permanent pairs — a "cabinet system" (Sanders, 2020) in which the judge pronounces verdicts orally and the clerk drafts the written judgment. This stable pairing fosters trust and allows clerks — despite often lacking formal legal training — to exert greater influence in the adjudicative process (Holvast & Mascini, 2020).

As a result, the once-clear boundaries of expertise between judges and clerks are blurred, transforming judgment writing into a more collaborative work. This integration introduces a new form of connective practice, where the boundaries of "rendering justice" are increasingly permeable. Yet the judge retains ultimate decision-making authority, emphasizing that a hierarchical structure still exists within the partnership: "Now, I just review and sign once the clerk has prepared the draft judgment and has put everything together." (Police court judge, November 2022, Epsilon Court)

This example underscores a key point from Faulconbridge et al. (2021): in response to change — such as the introduction of *MaCH* — judges choose to engage with "outsiders" (i.e., clerks) rather than isolate themselves, leading to a relational definition of expertise and action. Consequently, judicial expertise continues to be essential, reinforcing traditional autonomy and the "collegial" aspects of occupational professionalism (Evetts, 2011). Viewed through the lens of boundary work, the judge–clerk partnership forms a protective yet connected arrangement: while clerks assume new responsibilities, judges maintain discretion over the more complex legal reasoning. Thus, the expertise boundary in drafting judgments is expanded to include clerks while preserving the judge's elevated status.

- *Judges: deep legal work and template governance*

Again, this leaves more time and more space to the judges to concentrate on work that demands a certain level of expertise. Some files are too complex to be resolved from the bench. They require specific reflection and motivations that clerks cannot generate from *MaCH* but that only the judge can write, given his higher legal expertise:

> "For example, if the person has been a victim of an accident, there will be legal considerations. I base my reasoning on case law and legal doctrine, which I must cite accurately in the judgment. So, *MaCH* cannot do that." (Police court Judge, November 2022, Epsilon Court)

With *MaCH* automating simpler sentencing "motivations," some judges — especially those in Wallonia that are sceptical of standardized templates — express concerns about potential threats to judicial independence. In contrast, others, mostly Flemish judges, welcome the chance to join a working group to revise these templates. Their revisions aim to achieve two main goals: first, to make the language more accessible for litigants, and second, to standardize sentencing justifications across different linguistic communities. This initiative demonstrate that *MaCH* do not simply impose new logics onto professional practices; it is also driven and mediated by organizational arrangements and professional negotiations. Ultimately, the time saved through automation allows judges to manage a greater volume of complex cases, reducing backlogs and reinforcing their core jurisdictional authority.

By digitizing routine tasks, *MaCH* can standardize sentencing and free magistrates from clerical chores, but this standardization comes with strict scripts that sometimes preclude legally feasible practices. As one judge explains, "While certain work practices, like the disjunction of a case, are materially, intellectually, and legally feasible, *MaCH* does not permit these manipulations. That can hinder our independence" (Police court judge, October 2022, Beta Court). Another observes, "We are increasingly dictated by 'The program does not allow it, so it is not possible.' The law allows it, but the computer blocks it." (Police court judge, October 2022, Beta Court). These constraints reflect the tool's affordances and scripts (Akrich, 1987): *MaCH* frames inputs and outputs in ways that preserve consistency but narrow discretionary leeway. These rigid scripts reflect the design choices made by AX'OP, illustrating that system agency is inseparable from the agency of its designers, who inscribed particular organizational logics into *MaCH*'s architecture.

Yet magistrates remain the ultimate decision-makers. They strategically mobilize *MaCH*'s automated functions — customizing templates, overriding defaults when possible, or routing around the tool — to maintain control over substantive legal reasoning (Noordegraaf, 2007, 2015). In this way, *MaCH* both dispossesses and reinforces judicial expertise: it restricts certain practices through its rigid design, even as it strengthens magistrates' authority by offloading routine work and spotlighting the very tasks that demand human judgement. As we see, expertise is not tied to a group or an "expert" but enacted through situated practices. This situation underscores how judges and prosecutors maintain their professional autonomy and discretion within ongoing processes of digitalization, reflecting the tension inherent in the hybrid form of professionalism they navigate — balancing the influence of organizational structures with their traditional, collegial decision-making processes.

6.2. Emergence of "technologists" within the network

Since the road traffic criminal justice system operates as a supply chain, the redistribution and reshaping of networks of expertise occur not only within each partner's organization but also between them. For instance, police services now handle all information encoding in *ISLP*, after which the data is transmitted from *ISLP* to *MaCH* for distribution throughout the rest of the chain.

Within the supply chain network, some actors have decided to broaden their area of expertise by performing IT-oriented practices. Initially, these new work practices emerged informally,

implicitly, and on a voluntary basis. Across all levels of the chain, users facing challenges with *MaCH* naturally sought assistance from those known to be most adept. These "technologists" included magistrates, clerks, as well as registry staff members within courts and prosecutions. Echoing Abbott (1988) this paraprofessional group emerged to answer a new need that was not yet covered by the established professions' jurisdictions. Over time, technologists who embraced their new expertise gradually positioned themselves as privileged intermediaries with AX'OP. In 2020, their responsibilities were formalized by the Conference of Chief Clerks, which established them as "the group of experts." This group comprises six people: four Dutch-speaking and two French-speaking. A stronger enthusiasm for the digitization of justice in the north compared to the south, explain the overrepresentation of Flemish technologists in the expert group. However, no additional budget was allocated for this group to function, limiting participation to technologists from larger or less overburdened jurisdictions. In smaller or already overwhelmed courts, assigning a full-time individual to these practices would have excessively weakened the structural framework.

In addition to acting as the intermediary between end users and the IT partner, "the group of experts" was assigned two further responsibilities: overseeing the task force of judges dedicated to enhancing the automated motivations within *MaCH* and supervising as well as prioritizing IT developments in close collaboration with AX'OP. Technologists have managed to establish exclusive expertise by mastering the *MaCH* tool more efficiently, thereby positioning themselves as strategic partners capable of resolving *MaCH*-related issues.

> "The experts are truly the people we turn to whenever we have a problem. And in 99% of situations, they know how to solve it directly. It's great because it allows us to avoid calling the hotline at AX'OP, waiting several minutes on the phone only to speak to someone who doesn't understand the tool." (Chief clerk, September 2022, Beta Court)

This highlights how technologists became an indispensable support structure, reducing reliance on external contractors (AX'OP). By outsourcing control over *MaCH*'s architecture outside of the judiciary, the system simultaneously created demand for internal brokers capable of translating between AX'OP's technical decisions and everyday legal practices. This expert group has further solidified its area of expertise, as *MaCH* users acknowledge that the initial training was

insufficient, leaving many with a limited understanding of the tool and its capabilities — and consequently, quite dependent on these experts.

> "Thank God that we have a friendly expert on our floor because we weren't really trained on *MaCH*, and we're learning as we go. So, he is an essential resource for us." (Clerk at the prosecutor office, December 2022, Epsilon Office)

This points to a reliance on peer-to-peer expertise, where technologists play a crucial role in stabilizing daily practices. By bridging the gap between legal professionals and the digital system, they both support routine functioning and redraw the boundaries of expertise within the justice chain.

6.3. Strategic responses to technologist emergence

Technologists now form a new "network of expertise" (Elmholdt & Elmholdt, 2017). In response to this emerging professional group, the other actors adopt two strategies to safeguard their professional boundaries. These strategies can be illuminated by the concept of "protective connectedness" (Faulconbridge et al., 2021). One strategy is to collaborate with technologists. By delegating "technological work" to them, actors ensure that they always have an operational tool that allows them to carry out their own "privileged work."

> "I'm lucky because my office is right next to the expert's office. And since we get along well, whenever I have a problem with *MaCH*, I just call him, and he solves it directly." (Court clerk, December 2022, Epsilon Court)

Alternatively, some professionals choose to integrate themselves into the technologists' network — by joining the judges' task force for example. By reinventing their practices and taking on new tasks unique to their expertise, they guard against the risk of being replaced by another professional group or the tool itself.

In sum, the different professional groups employ protective connectedness to respond to the rise of these new "technologists." Some delegate IT-related tasks entirely, ensuring *MaCH* functions smoothly without infringing on their core legal responsibilities, while others embed themselves in the technologist network, co-developing templates and functionalities that reinforce their

indispensable status. Thus, the emergence of technologists highlights how new boundaries of expertise are drawn — not necessarily along traditional professional lines, but through mastery of specific technologies and their integration into legal work. However, it does not blur the lines between legal and technical expertise; instead, it further delineates them, with those mastering *MaCH*'s technical dimensions forming a paraprofessional subgroup (Abbott 1988) that supports or amplifies judicial authority, rather than challenging it.

Ultimately, understanding the interplay between magistrates, clerks and technologists requires recognizing that their expertise is defined relationally. Faced with *MaCH*, professionals reconfigure their expertise boundaries by forging connections with other professional groups or tools that naturally coexist in the new framework. This sense of protective connectedness enables them to navigate the evolving landscape, highlighting that *MaCH* reshapes professional practices not merely by diminishing or enhancing work, but by creating new modes of collaboration, practices, and, ultimately, expertise.

7. Discussion and conclusion

This paper offers new insights into how ICT integration — exemplified by the *MaCH* tool — has led to the reconfiguration of networks of expertise within the Belgian road traffic criminal justice supply chain. Drawing on a multi-case study approach across contrasting jurisdictions, our research develops a nuanced, context-sensitive understanding in how *MaCH* mediates boundary work and reconfigures practices.

To situate these changes, it is important to recall that the pre-*MaCH* environment was characterized by significant fragmentation. Professional groups were structured by their internal systems and regulatory constraints, which, while ensuring independence, limited information flows and prevented cohesive collaboration across the criminal justice network. The inherent complexity of the supply chain resulted in isolated expertise, fragmented communication, and a patchwork of work practices.

The introduction of *MaCH* in 2007 marks a pivotal evolution. Our analysis demonstrates that *MaCH* has transformed pre-hearing and post-hearing processes by automating data integration, streamlining bilateral exchanges between prosecution and courts, and enabling automated

document generation. These transformations have liberated judicial actors from repetitive tasks, allowing clerks to assume more "up-ranked" responsibilities and enabling magistrates to focus on complex legal matters. Importantly, while *MaCH* standardizes routine administrative functions, its influence during courtroom proceedings remains hybrid, as traditional paper-based practices persist due to digital distrust, pragmatic and legal constraints and symbolic practices. Thus, *MaCH* does not entirely replace established methods but rather complements them, creating a dual-layered approach to digital change in judicial practice.

The enactment of these transformations, however, is not uniform. While cultural-linguistic difference (Wallonia/Flanders) shape the contours of everyday work, the variation we observe emerges more from the interplay of professional, organizational, and institutional practices and structures. These include the distribution of drafting tasks, differing emphases on autonomy versus standardisation, caseloads, leadership, and the presence of embedded "technologists." Across both sites, the same protective-connectedness dynamic operates, but its degree and locus differ — downstream micro-edits by clerks versus upstream template work by judges, for instance. In short, region provides context, while these factors structure enactment, explaining why similar mechanisms crystallise differently on the ground.

It is precisely through these shifts in everyday practices that changes in the network of expertise become apparent. By delegating low-value tasks and redistributing responsibilities, *MaCH* has enabled strategic boundary work among prosecutors, judges, court clerks, and registry staff members. This reconfiguration has allowed magistrates to safeguard their "true expertise" in decision-making while simultaneously fostering the emergence of a new paraprofessional group — technologists — who have become essential intermediaries in managing and maintaining the digital tool.

These shifts have redefined professional expertise boundaries: traditional practices are now complemented by collaborative practices that embody both protective and connective dimensions (Faulconbridge et al. 2021). With repetitive tasks such as data encoding and legal element collection being exclusively handled at the police stage, clerks have been enabled to take on early-stage analyses that were once the purview of magistrates. It is through these practice changes that we observe a reconfiguration of the network of expertise; however, despite these shifting

boundaries, the underlying power dynamics remain largely unchanged. Magistrates continue to maintain control over critical decision-making processes, preserving their authority even as clerks and technologists assume supportive practices. This strategic delegation not only reserves the exclusive decision-making domain of magistrates for crucial matters — such as managing deadly accidents or addressing recidivism — but also transforms clerks and technologists into cooperative partners rather than competitive threats. Ultimately, this approach preserves both the privileges and the core expertise of the magistrates.

These findings illustrate how *MaCH*, while enhancing coordination across the judicial supply chain, introduces a new layer of complexity. Designed to overcome fragmented systems and siloed practices, its deployment within a system fundamentally shaped by institutional autonomy and the *tria politica* raises questions about how such integration efforts interact with long-standing structural separations (de Blok *et al.* 2015). As digital tools reshape practices and reconfigure expertise, they also test the limits of how much standardization a justice system rooted in independence can accommodate.

This observation sends us back to how the "modernization" of justice is and should be considered and enacted in Belgium. The design and maintenance of *MaCH* by a private consortium inscribes organizational imperatives into the very architecture of the system, thereby shaping the scope of judicial discretion and the strategies through which professionals safeguard their expertise. Furthermore, there exists a permanent tension between delivering a qualitative and efficient service to citizens (Ambe 2012) and preserving certain fundamental values that are inherent to the exercise of the function of judging, like the independence of the judiciary (Whalen 2022). Within road traffic criminal justice supply chain, *MaCH* might have helped to reinforce practices and procedures that were already rigid and strict and not particularly suitable to autonomy. This highlights a twofold dilemma. First, there is a challenge in balancing the control of workflows, automation, and process standardization while allowing professionals the flexibility to adapt in their work. This flexibility is necessary for them to manage the unique aspects of each case. Achieving justice and ensuring a fair application of the law often involves norms and ethics, dedicating substantial time to studying the intricacies and distinctiveness of each case, and possessing expertise at every stage of the supply chain process to ultimately deliver a just verdict (Blok et al., 2015). Hence, professionals are stuck with this hybrid form of professionalism

(Noordegraaf, 2007, 2015) that continually balance between applying expertise to deliver the best possible service, i.e., render a fair judgement, and following a smooth flow of inputs and information necessary to make such judgements. Would the road traffic criminal justice system not be as suitable for and compatible with ICT after all? Second, for many judges, the act of rendering justice is the same as exercising independent decision-making. Judges have a status that guarantees them independence in the exercise of their judicial functions (Constitution, Art. 151, Moniteur Belge, 1994). More specifically, this status grants judges the autonomy to make decisions on disputes brought before them on a case-by-case basis, without any constraints. They can choose the approach they deem most appropriate, ensuring it aligns with the rules of law and procedure. To which extend do the "modernization discourse" and *MaCH* call this independence into question? In light of these considerations, might a "not fully digital" option (Seepma et al. 2021), be an appropriate solution for legal public supply chains?

PART FOUR — WHAT DIGITAL INFRASTRUCTURES TELLS US ABOUT JUSTICE: RECONFIGURING COURTS FROM WITHIN

CHAPTER 8 — DISCUSSION

This chapter offers a cross-cutting discussion on the findings presented throughout this thesis, engaging directly with its central object of study: digital infrastructures in justice courts, understood as situated tools through which change is enacted. Organized into four interconnected sections, the discussion synthesizes insights from three empirical articles, each examining a distinct digital tool — *juriDict* at the Council of State, *RegSol* in the commercial courts, and *MaCH* within the police courts — to reveal how digital infrastructures interactively shape both the administration of justice and the processes of justice administration within Belgian courts. The first section reasserts the central objective of this research and presents the analytical architecture developed in the three subsequent sections. In the second section, the discussion revisits each article to foreground the specific insights they offer through the lifecycle phases — development, design, maintenance, and use — and the four analytical lenses — socio-technical, organizational, socio-political, and professional. This part is empirical, case grounded, and anchored in the situated configurations observed in each article. It illustrates how these perspectives and phases materialize uniquely within each judicial context, emphasizing that digitalization cannot be understood as a singular or homogeneous "digital transformation", but as multiple, contingent, and context-dependent processes. The third section delves deeper into four transversal interpretive dimensions: socio-technical scripts, structuring of collective practices, socio-political scripts, and strategies of expertise reshaping aimed at jurisdictional preservation. These are anchored in the four analytical lenses and identified abductively across the empirical cases. These dimensions act as cross-cutting analytical threads, revealing deeper, shared dynamics of change across varied contexts while materializing differently within each of the three jurisdictions. This progressive analytical build-up leads to a fourth and more interpretive section, where the cumulative effects of these dynamics are discussed in terms of institutional reconfigurations. This final section questions the linear narratives of judicial reforms by emphasising the plurality and complexity of *digitalization(s).* It introduces and elaborates the notion of the "digital undertow," a conceptual tool useful for understanding the subtle, often unnoticed institutional displacements triggered by digital infrastructures — in the judicial normative environment, in the exercise of professional discretion, in what counts as "good legal work," and in how authority and power are distributed. Through this nuanced analysis, the thesis proposes a vision of "digital transformation" that is better understood

as a multifaceted and layered phenomenon, observable through infrastructures, advancing a deeper comprehension of the justice system in its digitally mediated forms.

1. Laying the analytical groundwork

In this thesis, the empirical focus is on digital infrastructures — concrete tools such as *MaCH*, *RegSol*, and *juriDict* — that have been introduced into Belgian judicial institutions. These infrastructures are examined as sites where professional practices, expertise networks, organizational arrangements, and public action are continually reshaped. By tracing how infrastructures are developed, embedded, and enacted, the thesis shows how they may produce diverse and often unexpected forms of change. Their socio-technical character means that judicial institutions, actors, and digital tools co-constitute each other, generating shifts in practices, norms, and steering configurations (Feldman & Orlikowski, 2011; Orlikowski, 2007; Suchman, 2007)(Feldman & Orlikowski, 2011; Orlikowski, 2007; Suchman, 2007). In this way, infrastructures can be understood as opening pathways toward plural, situated, and contingent transformations of justice — transformations that differ from, and sometimes challenge, the linear narratives of reform in which digitalization is typically framed.

The central objective of this doctoral research is to investigate how the deployment of digital infrastructures within judicial institutions materializes concretely within specific courts, exploring the dynamics, tensions, and reconfigurations generated through their infrastructural embedding. Methodologically, this inquiry adopts an abductive, iterative case study strategy, focusing specifically on three tools within their distinct judicial environments. The conceptual framework draws on ANT (Akrich et al., 2006), the SOA (Crozier & Friedberg, 1977), and socio-materiality (Orlikowski, 2010; Suchman, 2007), emphasizing the continual reconstruction of networks, organizational practices, but also socio-political configuration and boundaries of expertise. The overarching research question guiding this study is articulated as follows:

How do digital innovations interactively shape — and become shaped by — judicial practices across contrasting Belgian judicial settings?

Before presenting the study's analytical framework, it is important to clarify the role that cultural and linguistic differences play in this analysis. Given Belgium's institutional landscape — divided

along linguistic and regional lines — these differences were initially integrated into the case selection strategy to ensure contextual diversity. Early fieldwork observations, as well as prior comparative work in judicial settings (Vigour, 2018), suggested that cultural-linguistic factors might also appear as analytically relevant. However, as the research progressed, these differences did not structure the unfolding of digitalization in justice as strongly as expected. What surfaced instead are transversal dimensions — professional configurations, institutional logics, and organizational arrangements — that cut across the linguistic-based cultural distinctions and proved more decisive in reciprocally shaping and being shaped by digital tools. Cultural-linguistic factors are therefore treated as a "context of action," rather than as a "context of meaning" (de Bony, 2010). Drawing on a situated and interactional conception of culture (Friedberg, 2005), the thesis examines how actors strategically mobilize cultural references within specific organizational and institutional constraints, rather than assuming they are passively shaped by community norms. In this sense, culture is enacted and negotiated through practice (Barmeyer et al., 2019); it interacts with, but does not determine, the professional and institutional dynamics at the core of the analysis.

This clarification is consistent with the abductive mode followed in this research — iterative, situated, and attentive to the tensions between empirical observations and theoretical formulations. The research trajectory was shaped by a continuous back-and-forth between fieldwork and conceptual work. The inquiry was shaped by surprises in the field — moments of friction, hesitation, or unexpected alignments — that challenged our initial assumptions and prompted new questions. In line with a relational ontology (Latour, 2005; Musselin, 2005) and pragmatic epistemology (Dubois & Gadde, 2002; Pierce, 1934), this thesis treats institutions, technologies, and norms as configurations enacted in practice. The research design thus stayed open to the ways in which digital tools —and practices around them — took form dynamically, through the everyday negotiations of actors and systems in interaction. This approach also foregrounded the role of the researcher — not as a neutral observer, but as a situated actor within the inquiry. The researcher's presence, interpretations, and prior knowledge were not bracketed out but treated as part of the knowledge-making process, in line with the epistemological commitments to reflexivity and intersubjectivity (Anadon & Guillemette, 2006; Dubois & Gadde, 2002). Engaging closely with judicial actors — listening to their narratives of adaptation, resistance, and doubt — meant navigating ethical and relational dimensions that were inseparable from the analysis itself. These experiences did not just inform the data; they shaped how they were interpreted. In doing so, they

reinforced the thesis commitment to an approach where theory remains grounded in practice, and where knowledge is generated through ongoing, situated engagement with the complexity of the field. These encounters reinforced the idea that digital transformation is not a unitary phenomenon to be observed "from above," but through the multiple concrete ways in which it is done, interpreted, and resisted on the ground. This abductive and action-centred posture became not only a methodological choice, but a way of staying close to the complexity of the phenomena under study.

The aim of this research is not to provide an exhaustive catalogue of transformations across judicial contexts. Instead, it develops a structured analytical approach to examine how innovations embed and evolve, organized around three interrelated frameworks: the lifecycle of digital tools, four analytical perspectives, and four transversal interpretive dimensions. First, the lifecycle, comprising development, design, maintenance, and use, serves as a heuristic to structure understanding. Primarily, the lifecycle enhances analytical visibility by tracing evolving entanglements between tools, actors, and institutions over time, thereby allowing a clearer view of the four analytical perspectives. Second, these four perspectives — socio-technical networks (S-T), organizational (O), socio-political (S-P) and professional (P) — are critical analytical frameworks and offer theoretical entry points. Each perspective foregrounds specific aspects of digital innovation, such as socio-technical assemblages and their relational effects, strategic interactions, structuring of public action, and expertise boundary reconfigurations. While each article gives analytical primacy to different combinations of perspectives and lifecycle phases over others, all perspectives and phases are always implicitly present in each case, sometimes operating subtly in the background. Through cumulative cross-case reading, these latent dynamics become more visible. Digital tools thus appear never confined to a single phase or logic; rather, they are progressively illuminated through the iterative progression of the research. Finally, transversal dimensions emerge abductively from the joint reading of cases, cutting across both lifecycle and analytical perspectives. While each article offers a focused analysis, these dimensions highlight recurring dynamics across contexts. The layered analytical approach outlined above brings into focus the digital undertow and the accompanying institutional displacements that are fundamentally reshaping how court professionals perceive, practice, and conceptualize judicial work, a process that will be further developed in the fourth part of the discussion.

2. Tracing perspectives and lifecycles phases: A situated cross-case overview

The first article analyses *juriDict*, a legal database and classification tool developed within the Council of State. It primarily mobilizes the socio-technical and professional perspectives, focusing on the design, development and maintenance phases of the tool's lifecycle. The analysis shows how *juriDict* was initially developed around an open-source logic of harmonizing old databases aimed at making legal knowledge accessible, and how its design was shaped through iterative feedback loops involving documentalists and legal experts. These participatory dynamics highlight how expertise is performed and adjusted in practice, through the co-construction of a digital infrastructure where professional needs and expertise were iteratively negotiated and embedded. In terms of maintenance, the tool is internally and informally sustained by a professional community, through ongoing classification updates and a constant feedback cycle that helps keep it relevant and functional over time. While the article does not explicitly focus on the use phase or on socio-political and organizational perspectives, these elements nonetheless become clearer when considered alongside the other two case studies. The tool supports flexible daily use and contributes to improving legal retrieval and metadata structuring, reinforcing the autonomy of users in their interaction with legal knowledge systems. From an organizational and socio-political standpoint, the process was characterized by low political interference, with development and design led by in-house professionals, following an incremental approach within the Council of State. This mode of development points to a decentralized configuration of public action that empowered local professional actors in shaping the tool. *juriDict* thus appears as an instrument embedded in a specific administrative context — structured by internal expertise, low-conflict decision-making, and an evolving classification infrastructure that helps structure metadata and consolidate professional practices.

The second article investigates *RegSol*, a centralized digital platform for managing insolvency procedures in commercial courts. It primarily mobilizes the socio-political and organizational perspectives, with a specific emphasis on the development and use phases of the tool's lifecycle. The analysis shows how *RegSol*'s development was driven by a digital file logic aimed at promoting efficiency and automation, while simultaneously relying on the early mobilization of

legal professionals to build legitimacy and support. Its public–private design emerged from strategic negotiations between public authorities, professional associations, and private IT providers. These negotiations were shaped by efforts to pre-empt resistance and to centralize actors around a single platform, with the broader goal of optimizing processes and reducing redundancy. In the use phase, the article highlights how the platform triggered substantial control and access tensions across professional groups. For some users, the system's structure created a conflict between the system and established professional practices, as its automated procedures clashed with established workflows. This resulted in differentiated appropriation, as users adopted and adapted the platform at different speeds and with varying levels of integration. Consequently, *RegSol* contributed to a broader reshaping of practices, as professionals reconfigured their routines in response to the platform's technical constraints. While maintenance is not the central focus of the article, it emerges as a relevant dimension. *RegSol* is sustained through a complaint-driven update model and relies on outsourced maintenance, leading to delays in improvements and recurring upgrade bottlenecks. These dynamics contribute to a sense of user frustration and a limited capacity to influence the platform's evolution, reinforcing broader tensions around the structuring of public action, the distribution of responsibilities, and the reconfiguration of professional practices.

The third article focuses on *MaCH*, a centralized case management system rolled out in police prosecution offices and courts. It primarily mobilizes the socio-technical, organizational, and professional perspectives, with a specific focus on the use and maintenance phases of the tool's lifecycle. *MaCH*'s development and design was shaped by a centralized state reform logic and a unified application, driven by a desire to streamline and automate processes uniformly across jurisdictions. The design was externalized, with limited consultation of frontline professionals. This top-down implementation strategy, marked by a lack of local adaptation as actors were expected to adopt standard templates without substantial room for customization, introduced early stakeholder frictions that would later affect the tool's use. The use phase is at the heart of the article's analysis. Users frequently encountered interface limits, which constrained their ability to align the system with complex, situated practices. Many professionals responded by bypassing these limits through informal solutions, workarounds, or off-system coordination. These tactics allowed them to maintain a degree of control over their work but also revealed how the system's rigidity redefined workflows, challenged existing professional practices, and enabled new

collaborations across professional groups and departments. In terms of maintenance, *MaCH* operates through centralized patches deployed by external developers, with limited direct input from end users. While formal feedback mechanisms are largely absent, technologists serve as intermediaries, relaying local concerns upward — though without guaranteeing responsiveness. This reactive maintenance model is coupled with informal support networks created by professionals themselves to manage day-to-day issues. Together, these arrangements highlight a broader lack of institutionalized agency in shaping digital tools, as users navigate the system with few formal channels for adaptation or influence over its ongoing development. The article shows how the tool reshapes professional relations and everyday work in courts and exposes the adaptations, compromises, and forms of resistance that emerge in response to attempts to standardize judicial work.

Together, the three articles offer distinct yet cumulative insights of digital infrastructures in practice, each highlighting different facets of how they become embedded within judicial contexts. While certain analytical perspectives and phases are emphasized more strongly in some cases than in others, their combined reading reveals shared patterns and cross-cutting dynamics. These dynamics are co-constitutive: each phase of a tool's lifecycle both shapes, and is shaped by, the multiple and overlapping logics at play. For instance, the limits of *juriDict*'s maintenance logic emerge more clearly when contrasted with *MaCH*'s centralized patching strategy; or the dynamics of professional boundary redefinition in *RegSol* become sharper when examined alongside *MaCH*'s automation-driven workflow shifts. In this sense, it is by tracing digital infrastructures across phases and perspectives that the thesis brings into focus the situated and negotiated character of the transformations they enable — transformations involving professional, organizational, and political arrangements (Nonjon & Marrel, 2015; Orlikowski, 1992).

For a synthetic overview of the perspectives and lifecycle phases covered in each case, see Table 4. In this table, elements in bold indicate those explicitly developed within each article, while non-bold elements represent aspects that emerged more implicitly or gained visibility through the cumulative, cross-case analysis. The four perspectives provided situated entry points to examine how digital tools are developed, designed, maintained, and used within justice institutions. We now move from this first, empirically case-grounded step to a second, more analytical engagement with the transversal dimensions.

Tool	Perspective	Lifecycle			
		Development	**Design**	**Maintenance**	**Use**
juriDict	S-T	**Open-source logic**	**Harmonizing old databases**	**Classification updates**	Structures metadata
	O	Incremental within Council	Led by in-house professionals	Informal sustainment	Flexible daily use
	S-P	Empower local actors via decentralization	Internal, low political interference	Internally sustained by community	Strengthens autonomy
	P	**Make legal knowledge accessible**	**Iterative feedback loop**	**Constant feedback cycle**	Improves legal retrieval
RegSol	S-T	Digital file logic for insolvency	Centralizing actors	Delays in improvements	Conflict between system & practices
	O	**Pre-empt resistance by involving actors**	Actor negotiations shape design	Outsourced maintenance	**Changing working routines**
	S-P	**Mobilizing law professionals**	Public-private design	Complaint-driven updates	**Control and access tensions**
	P	Efficiency and automation targets	Optimizing processes and reducing redundancy	Upgrade bottlenecks	Uneven appropriation
MaCH	S-T	Unified application narrative	No local adaptation	**Reactive maintenance**	**Interface limits use**
	O	Top-down, no local input	Stakeholder friction	**Users lack agency**	**Redefines workflows**
	S-P	Centralized state reform logic	External	Central patches, mediated input via technologists	Promotes new collaborations
	P	Streamlining and automating processes	Automation-driven	**Informal support networks sustain daily use**	**Users bypass limits by local adaptation**

Table 4. *Analytical perspectives and lifecycle phases across the three judicial contexts*

3. Making sense through transversal dimensions

In this third part of the discussion, the analysis shifts from the situated mobilization of analytical perspectives toward a more transversal reading of the material. Building on the insights developed in the previous section, we now re-engage each perspective through a specific dimension that deepens the analysis by highlighting recurring dynamics cutting across tools and courts. Within each analytical perspective, one such cross-cutting dimension was selected — namely, the socio-technical script, the structuring of collective practices, the socio-political script, or the strategies of expertise reshaping aimed at jurisdictional preservation. These dimensions do not aim to exhaustively capture the full scope of each perspective but serve to anchor the analysis in tensions and processes that proved empirically salient both within and across the studied jurisdictions. Rather than being predefined, they were progressively shaped and refined through the cumulative insights of each empirical article. In doing so, these dimensions act as analytical threads that reframe the perspectives and extend their interpretive reach. Digital tools thus emerge as both products and drivers of institutional transformation — actively reshaping how justice is conceived, organized, and practiced.

To clearly communicate these insights and the reflexive trajectory of the analysis, a synthesis is presented in the form of a table, gradually built through each case study, that functions as both a visual and conceptual device. It brings together the selected dimensions and traces how they materialize differently across the three judicial settings examined — the Council of State, the commercial courts, and the police courts. Alongside these four interpretive dimensions that constitute the main conceptual lens, the table also includes two contextual dimensions — the reform waves and the professional groups brought into focus — which serve as grounding elements. As a whole, the table offers a structured, yet evolving synthesis of how digital infrastructures are appropriated, negotiated, and embedded across contrasting institutional contexts, while making visible the transversal logics at play. It thus becomes a central analytical tool for showing how the four perspectives intersect and take form in empirical settings, while also bridging the case studies with the broader conceptual architecture of the thesis. In doing so, it highlights how institutionally distinct jurisdictions nonetheless navigate in shared dynamics of change.

3.1. Reform waves and professional groups as context anchors of the analysis

In this section, we begin building Table 5 by introducing two contextual dimensions, which help situate the further analysis of digital infrastructures. These dimensions do not serve an interpretive function on their own but prepare the ground for the interpretive dimensions that follow, by delineating the reform phases and identifying the professional groups through which infrastructures were channelled in each jurisdiction.

Dimensions	**Counsil of State**	**Commercial courts**	**Police courts**
Digital infrastructure	***juriDict***	***RegSol***	***MaCH***
Contextual dimensions			
Reform waves	A localized, modular and cooperative strategy (2008 – 2014)	Market-driven & outsourced Reforms (2015 – 2020)	Centralized management and global digitalization efforts (1999-2007)
Professional group(s)	Documentalists, Legal attachés, IT specialist	Bar Associations	Magistrates

Table 5. *Contextual dimensions of three judicial digital infrastructures*

As previously discussed, the Belgian judicial sector has undergone four main waves of reform: *centralized management and global digitalization efforts* (1999–2007), a *localized, modular, and cooperative strategy* (2008–2014), *market-driven and outsourced reforms* (2015–2020), and *holistic digital transformation ambitions* (2020–feb 2025). These phases reflect shifting political priorities, administrative logics, and socio-technical imaginaries regarding the role of digital technology in justice. While four reform waves are identified, this thesis focuses on the first three, from which the three digital tools studied in this thesis — *MaCH*, *juriDict*, and *RegSol* — emerged. Each tool took shape within a specific reform context, entangled in distinct institutional logics, actor-networks, and evolving modes of coordination. For this reason, reform phases are included as a contextual dimension in the table: they offer a temporal and political backdrop that helps trace

how successive reform agendas contributed to shaping the conditions under which digital infrastructures took form in each jurisdiction.

The table also includes a contextual row identifying the key professional group(s) selected for analysis in each jurisdiction. This entry point reflects the action-centred and relational positioning of the thesis (Latour, 2005). These groups were not chosen to fit into rigid categories such as initiators, strategists, technical contributors, or end-users, but rather because of their central involvement in the dynamics through which digital infrastructures took shape. In some cases, a single group may occupy multiple roles (e.g., both contributors and users) across different phases — development, design, maintenance, or use. This flexible and situated approach allows the analysis to remain grounded in empirical realities while showing how actors shape — and become shaped by — the digital infrastructures they engage with. In the Council of State, attention is directed toward the documentalists, legal attachés, and the IT specialist who collaboratively developed, designed, and maintained *juriDict*. These actors were not only central to the technical architecture but were also deeply involved in the classificatory work that underpins the tool. In the commercial courts, the analysis focuses on the Bar Associations, which, in collaboration with a private IT firm, steered the shaping of the *RegSol* platform. As both users and strategic actors in the development, design and governance of the infrastructure, their work is crucial to understand how professional interests, digital agendas, and private-sector logics converge in this case. Within police courts, the analysis centres on magistrates, who played a key role in appropriating and adapting the *MaCH* system within their judicial routines. Their position as both users and negotiators of the system makes them particularly relevant for examining how digital standardization constrains, reshapes, and at times enables judicial work.

3.2. A dimensional analysis of situated infrastructural dynamics

The following sections present the interpretive dimensions developed within each of the four perspectives. In continuity with the methodological chapter, we begin with the socio-technical and organizational perspectives, before turning to the socio-political and professional lenses. This sequence mirrors the analytical trajectory adopted throughout the empirical investigations.

3.2.1. The socio-technical perspective: Reading digital infrastructures through their technical scripts

Central to the socio-technical perspective is the dimension of *socio-technical script* (Akrich, 1987, 1990, 1991), which refers to the way designers embed assumptions about users, roles, actions, and contexts into the technical structure of a device. Rather than being neutral tools, digital infrastructures are inscribed with a "program of action" that anticipates how they should be used, by whom, and under what conditions. These scripts delegate specific functions to users and objects, defining and distributing responsibilities, sequences of action, and acceptable behaviours (Latour, 1990). In doing so, they reflect and reproduce broader social, institutional, and political orders — often without making these visible to users themselves. Importantly, socio-technical scripts are not fixed. Once deployed, they are reinterpreted, negotiated, adapted, or even resisted by users. This makes the concept particularly well-suited to tracing how digital tools evolve across their lifecycle. Through this lens, digital infrastructures appear as carriers of anticipated behaviours and structured interactions between both human and non-human actors (Akrich, 1987; Latour, 1990), offering insight not only into what tools are *meant* to do, but also into what they *actually become* in situated practice.

In our case studies, we did not initially set out to look for scripts. However, they gradually emerged as a recurring pattern across the infrastructures we examined. What may appear as purely technical design choices in fact embody social intentions and redistribute agency among actors. These inscriptions privilege certain practices while marginalizing others, aligning the infrastructure with dominant agendas such as managerialization, centralization, or transparency (Carmes & Andonova, 2012). In each of the three case studies, a different socio-technical script underpins the tool's design and implementation. In the case of *juriDict*, the socio-technical script is guided by an *open-source logic*, which serves both as a design principle and a political stance. This choice responds to the Council of State's desire to maintain institutional independence from proprietary software while fostering transparency, sustainability, public accessibility, and design autonomy. This script is operationalized through modular architectures and a classification of legal keywords co-developed with documentalists and legal attachés. In *RegSol*, the dominant script is the *digital file*. This script prescribes a standardized way of managing insolvency procedures by embedding administrative values such as efficiency and rapidity into the very structure of the platform.

Designed primarily by the Bar Associations and their IT partners, the tool sets the terms for how data must be entered, validated, and circulated. However, it also inadvertently marginalizes court clerks and magistrates, whose practices were not fully taken into account during development and were therefore not inscribed into the tool's design. Meanwhile, in the case of *MaCH* the socio-technical script reflects a *unified, overarching application*. Envisioned to overcome fragmentation across police courts and prosecution offices processes. This script inscribes coordination, standardization, and managerial rationalization into the infrastructure, promising seamless integration across services.

Tools do not operate in isolation from context. As they are used, they possess their own force of action; they tend to produce novel and sometimes unexpected effects. Their impact is shaped as much by their design as by their appropriation, repurposing, or contestation in practice. To further account for these context-dependent effects, we can draw on the work of Lascoumes and Le Galès (2005) and Lascoumes and Simard (2011). While these authors do not address digital infrastructures directly, their analysis of policy instruments and their effects provide a valuable lens for interpreting socio-technical tools as instruments of public action. First, the device generates aggregation effects (Lascoumes & Simard, 2011, p. 19) by constituting an obligatory passage point. It thus contributes to what Callon (1984) calls "translation activities," enabling heterogeneous actors to converge around issues they agree to tackle together. This learning process requires actors to modify or deviate from their initial conceptualizations. Second, the device creates inertia effects, which partly explain resistance to change (tensions among actor-users) and resistance to external pressures (governmental shifts, interest group pressures). In this sense, the device can be viewed as an "actor-network," because it occupies a central place in the definition of a public action program and in how that program evolves. Furthermore, while devices produce their own effects, they are never closed systems. They are intertwined with the contextual modes of their appropriation, operating in environments governed by specific logics resulting from existing configurations and dominant interpretations. Thanks to their plasticity (Lascoumes & Le Galès, 2005, p. 37), these digital tools are subject to differentiated appropriations depending on the organizations and institutions where they are introduced, as well as on the individuals handling them. These devices can give rise to new forms of professional mobilization, reinforce or challenge existing boundaries, and sometimes trigger resistance or unexpected alliances aimed at limiting their scope (Lascoumes & Simard, 2011, p. 20). Hence, analysing their reception and uses cannot

be neglected. It becomes essential to contextualize the transformations at work for actors who continue to act as mediators (Brodkin & Marston, 2013; Sacco et al., 2019).

Building on this perspective, the shaping of policies related to digital infrastructure arises from a heterogeneous arrangement — an "actor-network" (Akrich et al., 2006) — in which technical objects, singular experiences, local issues, governmental constraints, research, legal rules, prescriptions and doxa, as well as various consultants and service providers, all play a role (Carmes & Andonova, 2012). This viewpoint reveals how the uncertainty and technological fragility of such arrangements stimulate a re-evaluation of their managerial effects, focusing less on the designers' intentions and prescriptions and more on unexpected corollary effect or repurposed uses (Nonjon & Marrel, 2015). More broadly, the impact of the tool should be examined beyond its "organizational performance" functionalities and the uses prescribed by its designers (Chiapello & Gilbert, 2013). Indeed, tools are not solely determined by their specific features but rather by the plurality of intentions that inform them — ranging from socio-political imaginaries about efficiency and transparency, to organizational strategies of control, to professional aspirations for recognition and autonomy. Even when IT management infrastructures do not fully deliver on their technical and material promises — be they incomplete, interrupted, failing, uncertain, reappropriated, or underused — this does not mean "nothing is happening." Instead, the changes brought by reconfiguration IT infrastructures take shape in their contextual appropriation, which above all reshuffles the arrangements of actors, generating new forms of institutional coordination and plural ways of practicing justice (Nonjon & Marrel, 2015).

Thus, reading the three infrastructures through the lens of their socio-technical scripts invites attention to the gap between the world inscribed in the object and the world enacted through its deployment (Akrich, 1987), where infrastructures become visible not only in their functioning, but also in the maintenance of their stability (Denis & Pontille, 2022) and their frictions and failures (Star, 1999).

3.2.2. The organizational perspective: Structuring collective action through digital infrastructures

Within the organizational perspective, and building on the SOA (Crozier & Friedberg, 1977), this dimension focuses on the *structuring of collective practices* that is, how digital infrastructures

reshape the ways in which professional tasks, responsibilities, and interactions are distributed and coordinated within organizations. This lens attends to the informal mechanisms of coordination and the evolving arrangements through which actors adapt to, appropriate, or resist digital tools (Bernoux, 2006). In this sense, the structuring of collective practices acts as a revealing entry point into the effects of infrastructures.

As previously discussed, digital tools are not simply introduced into stable environments — they become central arenas of competition and negotiation. Because of their plasticity (Lascoumes & Le Galès, 2005), tools are open to different appropriations depending on the organization, the institutional context, and the individuals who use or manage them. Rather than remaining invisible, these tools uncover "spaces of struggle," highlighting how organizational practices, technological configurations, and local negotiations are deeply intertwined. By focusing on how tools are adopted, adapted, and contested within organizations, we can better appreciate how organizational order is dynamically constructed through strategic interactions. For instance, studies on judicial work (Ackermann & Bastard, 1993; Schoenaers, 2014) reveal substantial variation in how tasks and roles are structured within courts. This diversity appears in the degree of specialization or adaptability among judges and clerks, how responsibilities are allocated across different actors, and the extent to which certain activities are delegated to clerical staff. Each local setting thus constructs a unique "equilibrium," negotiated among the various court stakeholders — judges, clerks, and administrators. Although areas of uncertainty guide these negotiations, legal frameworks and formal authority impose boundaries on how far local arrangements can go, illustrating how institutional contexts both constrain and enable local adaptations.

The case studies show that such structuring processes emerge through situated interactions and context-specific negotiations. In the case of *juriDict*, this restructuring is anchored in the work of the *keyword commission*, a collective space where documentalists, legal attachés, and magistrates collaborate to classify legal information. This collaborative setting defines how legal texts are indexed and accessed and serves as an area for resolving epistemic ambiguities and institutional tensions. The commission acts as a stabilizing mechanism that links professional expertise with infrastructural design. In *RegSol*, collective practice is structured through ongoing *negotiation and coordination efforts led by the Bar Associations with both private IT firms and the Ministry of Justice*. Here, coordination is less about internal routines and more about cross-organizational

alignment. The design, development and maintenance of the platform depend on balancing the Bar's professional autonomy with the operational logic of private firms and the political logic of the Minister. This setup institutionalizes a form of public–private administration of justice, where strategic decision-making is embedded in contractual and financial relations, often at the expense of direct engagement with other professional groups such as clerks or magistrates. In *MaCH*, collective practices are structured around the established Judge–Clerk collaboration, commonly known as the *Cabinet System* (Sanders, 2020). While this organizational arrangement predates the introduction of *MaCH*, the deployment of the tool has amplified its use and reinforced its logic. As *MaCH* imposes increasing demands for workflow standardization, the Cabinet System becomes a strategic asset: clerks, already familiar with the preferences and working rhythms of their assigned judges, are able to anticipate, align with, and accelerate procedural flows. The system modifies how tasks are allocated and tracked, reinforcing certain hierarchies, while simultaneously encouraging tighter informal coordination. Over time, this dynamic also reveals efforts to adapt *MaCH* to local working practices and digital pressures to intensify pre-existing organizational forms.

Taken together, these cases illustrate that the structuring of collective practices is a central mechanism to illuminate the changing dynamics happening through infrastructures. Digital tools reshape organizational life not only by formalizing procedures or imposing standards, but by becoming sites where professional practices, coordination logics, and hierarchies are actively negotiated. This dimension brings into view the often-invisible work through which actors stabilize new forms of collaboration and sustain institutional functioning under conditions of technological change.

3.2.3. The socio-political perspective: Embedding political scripts in digital infrastructures

Having examined how digital infrastructures embed technical scripts and local organizational routines, we now shift our attention to the socio-political perspective, focusing specifically on the *socio-political script* dimension. Although not formally defined in the literature, the analytical function of socio-political scripts mirrors the well-established concept of "socio-technical scripts" (Akrich, 1991). The socio-political script reflects both the broader reform rationalities that articulate political objectives and shape expectations for how the justice system should evolve as

well as the concrete development and deployment strategies through which these reform logics are embedded into the design of digital infrastructures. Yet the core of the socio-political script materializes in the translation process: how abstract policy goals and institutional priorities are transformed into concrete technical decisions, development trajectories, and implementation modes. This is where the socio-political script mirrors the socio-technical script: just as the latter prescribes user roles and interactions through design, the former prescribes development practices and design choices through public action logics and reform orientations.

Understanding the socio-political script of a digital tool therefore requires situating it within the reform waves, which become visible in the architecture of the tools themselves, as they carry forward specific visions of how justice should be organized, delivered, and evaluated (Hood, 2007; Lascoumes & Le Galès, 2005; Lascoumes & Simard, 2011). Within this analytical framework, *juriDict*, *RegSol*, and *MaCH* represent distinct configurations of reform-driven development and design (Lascoumes & Le Gales, 2007; Williamson, 2016). Each tool was conceived to address a particular phase of judicial modernization in Belgium, and each encapsulates specific socio-political rationalities prevalent at the time of its design. These infrastructures do not accompany reform, they actively participate in enacting it (Baudot, 2015).

juriDict is anchored in the rationality of *decentralized empowerment*, which characterized Belgium's second wave of judicial reforms: a localized, modular, and cooperative strategy (2008–2014). This phase emphasized a shift toward greater local autonomy by implementing a corporatization strategy, particularly through the reorganization of judicial jurisdictions (e.g., the 2013 and 2014 legislative reforms) and adopting a cooperative strategy based on the empowerment of local actors. The reform logic responded to critiques of excessive centralization and promoted a more horizontal approach to steering justice systems (Pollitt & Bouckaert, 2011). This rationality was translated into the development and deployment of *juriDict* through specific design and implementation choices. The tool's open-source architecture, modularity, and emphasis on co-development reflect a deliberate internal, bottom-up deployment strategy, empowering local actors to autonomously manage legal information and resources. Together the reform rationality of decentralization and empowerment and the *bottom-up deployment* and design strategy through which these rationalities are translated form the socio-political script of *juriDict.*

RegSol is anchored in the rationality of *digitalization and marketization*. The third reform wave — market-driven and outsourced reforms (2015–2020) — foregrounds digital technology as a central vector for modernization. The socio-political script underlying this digitalization is structured around: a techno-centric vision, where digitalization is perceived as a universal solution to problems of efficiency, accessibility, and cost reduction (Baudot, 2015); the interplay of urgency and irreversibility, with narratives emphasizing the need to catch up on digital advancements and portraying digitalization as an inevitable step (Sacco et al., 2019); and increased marketization and privatization of judicial processes. This phase aimed at progressively and systemically integrating technologies into the judicial sector. This process positions digitalization as an integral component of judicial modernization, with digital tools functioning as both the objective, the means of change and the reform vector. These digitalization and marketization rationalities were translated into a partnership-based development and deployment strategy, formalized through a Protocol Agreement that laid out the terms of collaboration between the Bar Associations, private IT providers, and public authorities. This arrangement reflects a clear effort to operationalize digitalization through market-oriented solutions, concretely by a fee-based model that turns access to the platform into a paid service. As a result, *RegSol* functions as a standardized "digital file" that directly incorporates the reform's digitalization and market-driven logic into the structure of judicial insolvency procedures through a *partnership-based deployment*.

MaCH exemplifies the rationalities of *managerialization and centralization*. Developed during the initial phase of judicial reforms — centralized management and global digitalization efforts (1999–2007) —, *MaCH*'s socio-political script embedded NPM principles that prioritize performance measurement, efficiency, and cost optimization (Frydman, 2011). The central institutional mandate was to centralize and standardize judicial data management**,** reflecting managerial ambitions for administrative rationalization. This mandate was operationalized through the strategy of outsourced, *top-down deployment***,** distancing the technical process from operational users. The resulting *MaCH* platform, as a concrete tool, materializes this managerial logic into a unified, overarching application designed to streamline workflows, enhance procedural efficiency, and reinforce hierarchical coordination.

Across the three cases, the socio-political script offers a powerful lens to understand how reform rationalities are translated into concrete design choices. Digital tools materialize political agendas,

embedding broader visions of justice into code. This dimension reveals how digital infrastructures actively participate in public action, transforming distinct reform logics into corresponding development strategies that shape not only how justice is administered, but how it is imagined and steered.

3.2.4. The professional perspective: Negotiating jurisdictions of expertise through digital infrastructures

Within this fourth analytical perspective, we focus on the dimension of *strategies of expertise reshaping aimed at jurisdictional preservation*. Rather than directly transforming expertise, these strategies reflect how professional groups respond to digital infrastructures by developing practices aimed at remaining central, indispensable, or authoritative — often as a way to preserve their position within evolving networks of work. In doing so, these strategies contribute to the reconfiguration of boundaries, of practices, and ultimately, of what counts as expertise. To analyse this process, we draw on both the sociology of expertise (Elmholdt & Elmholdt, 2017; Eyal, 2012) and boundary work literature (Gieryn, 1983; Langley et al., 2019). From the sociology of expertise, we retain the idea that expertise is not a static asset possessed by accredited individuals or formalized professions (Freidson, 2017), but a relational and performative capacity, emerging from the situated interplay of human and non-human actors, tools, practices, and organizational routines (Eyal, 2012; Latour, 2005; Nicolini, 2009). In this networked configuration, maintaining relevance involves more than defending a formal jurisdiction — it requires ongoing engagement with technologies, scripts, and actors.

From the boundary work tradition, we adopt the view that professional groups — whether traditional professions or emergent occupational categories (Demazière & Gadéa, 2009) — engage in symbolic, material, and organizational efforts to construct, defend, or renegotiate their jurisdictional boundaries (Abbott, 1988; Gieryn, 1983; Lamont & Molnár, 2002). Boundary work can be competitive, as when actors seek to protect their territory, or collaborative, as when they align across domains to achieve shared goals (Apesoa-Varano & Varano, 2014; Barrett et al., 2012). However, when digital tools enter professional environments, these dynamics often coexist and intertwine (Langley et al., 2019). Technologies add a layer of complexity: boundary work unfolds not only between professional groups but also between professionals and the digital

infrastructures they inhabit (Nonjon & Marrel, 2015; Sacco et al., 2019). In this perspective, we therefore treat digital tools as active mediators that redistribute tasks and power relations, triggering a range of responses from some professional groups. These responses are not passive adaptations but deliberate strategies, they are ways of navigating socio-technical constraints while preserving or reshaping a group's legitimacy, centrality, and capacity to act. Based on the empirical findings of this thesis, we identify three such strategies across our case studies. Each reflects a distinct mode of negotiating expertise in response to digital infrastructures.

In the *juriDict* case, professional groups — particularly documentalists, legal attachés, and an internal IT specialist — engage in a form of boundary work rooted in epistemic collaboration (Callon, 1999; Collins & Evans, 2007). Together, they classify, index, and structure legal knowledge, participating in what can be described as a *co-construction of legal infrastructure through a collaborative epistemic strategy*. By aligning their day-to-day expertise with the governance of the platform, they reinforce their centrality within the organization's knowledge ecosystem. This strategy aligns with what Langley et al. (2019) call collaborative boundary work. Professional groups actively reconfigure their expertise by contributing to tool governance. It is a way to inscribe their expertise into the system itself: the functioning of the tool is embedded in classification practices, user interface choices, and the negotiation of epistemic tensions (Eyal, 2012; Timmermans & Berg, 2003). This reflects an active, relational form of knowledge work, what Eyal (2012) calls "networked expertise." Through their involvement, these actors reposition themselves as indispensable brokers between legal meaning and technological mediation.

In the case of *RegSol*, the Bar Associations engages in a more assertive and market-oriented form of boundary work. By initiating, owning, and coordinating the platform's development in partnership with a private IT firm and public actors, they deploy what we describe as an *entrepreneurial expansion strategy through infrastructure ownership* (Dubois et al., 2019). Here, professional relevance is maintained by performing new technical and coordination practices that go beyond traditional legal work. What we observe is a redefinition of expertise boundaries through the appropriation of new tasks — a process Abbott (1988) describes as jurisdictional reconfiguration in response to external disruptions. This reflects a logic of entrepreneurial professionalism, where legitimacy is derived not just from legal knowledge but also from infrastructural control and managerial expertise. It also illustrates how professional groups adapt

to managerial reforms and privatization by internalizing some of their logics — offering a vivid example of how organizational professionalism (Evetts, 2011) becomes entangled with classical occupational autonomy (Abbott, 1988). In this process, the Bar not only reasserts its jurisdiction but embeds it in a new socio-technical regime that stabilizes its expertise through tool governance and infrastructural authority (Pareliussen et al., 2022).

The magistrates' response to *MaCH* illustrates a different, more defensive strategy: *protective connectedness by delegating standard tasks* (Faulconbridge et al., 2021). Faced with growing managerial pressures and a rigid technical infrastructure, they collaborate closely with clerks — relying on them to prepare files, encode cases, and even draft judgments — while simultaneously preserving control over substantive decisions, legal interpretations, and procedural autonomy. This strategy hinges on maintaining the boundary between routine and complex tasks. As shown in the *MaCH* case, magistrates increasingly delegate standardizable practices while focusing on "higher" forms of legal work: reasoning, motivation, and judgment. By doing so, they defend their core jurisdiction while remaining integrated in the socio-technical system. This reflects broader dynamics identified by Eyal (2012): expertise is never exercised in isolation but performed through connections — with tools, routines, colleagues, and organizational norms. While *MaCH* imposes standardized practices, magistrates tactically circumvent or adapt them — joining template revision groups, supervising clerks' work, or resisting over-reliance on automatization — to retain interpretive control. In this way, their protective connectedness enacts a hybrid professionalism (Noordegraaf, 2007, 2015), one that blends tradition and digital innovation.

Across these three strategies, a common thread emerges: digital infrastructures do not merely reshape workflows — they actively mediate the ways in which professional groups assert their relevance, adapt their practices, and preserve their power. Whether through co-constructing classificatory frameworks, spearheading platform development, or tactically navigating automation, these actors engage in forms of boundary work that are simultaneously pragmatic, political, and symbolic. These strategies are not mutually exclusive, nor are they uniformly distributed across cases. Rather, they reflect a multiplicity of situated and strategic adaptations. What emerges, then, is not the erosion of professional authority, but its rearticulation through infrastructures. Authority and power are claimed, enacted, and sustained in new ways — sometimes by leveraging infrastructures, sometimes through negotiations around their use, and

sometimes via alliances that shape their scope. In that sense, these strategies should not be seen simply as responses to digitalization but as active contributions to shaping what digital infrastructures become, how professional jurisdictions are reconfigured, and how legitimacy is performed in everyday judicial work. Ultimately, this perspective reveals how expertise is not challenged by digital tools, rather, it is rearticulated through them. Table 6 is completed below with the four interpretive transversal dimensions, allowing for a full synthesis.

Dimensions	Counsil of State	Commercial courts	Police courts
Digital infrastructure	***juriDict***	***RegSol***	***MaCH***
Contextual dimensions			
Reform phase	A localized, modular and cooperative strategy (2008 – 2014)	Market-driven & outsourced reforms (2015 – 2020)	Centralized management and global digitalization efforts (1999-2007)
Professional group(s)	Documentalists, Legal attachés, IT specialist	Bar Associations	Magistrates
Interpretive dimensions			
Socio-technical script	Open-source database	Digital file	Unified, overarching application
Structuring of collective practices	Keyword commission	Negotiation and coordination efforts with private IT firms and the Ministry of Justice	Judge–Clerk collaboration: the "Cabinet System"
Socio-political script	Decentralization and empowerment translated through internal, bottom-up deployment	Digitalization and marketization translated through partnership-based deployment	Managerialization and centralization translated through top-down deployment
Strategies of expertise reshaping aimed at jurisdictional preservation	Collaborative epistemic strategy: co-construction of legal infrastructure.	Entrepreneurial strategy: expansion through infrastructure ownership	Protective connectedness strategy: delegation of standard tasks

Table 6. *Transversal dimensions of three judicial digital infrastructures*

3.3. What infrastructures reveal: Rethinking digital transformation as multiple *digitalizations*

Taken together, these four dimensions trace differentiated yet interconnected pathways through which digital infrastructures become embedded in judicial settings. While each dimension highlights specific dynamics — competing socio-technical and socio-political scripts, contrasting organizational rationalities, and diverging strategies of expertise reshaping — these socio-material changes do not materialize uniformly across courts. They all reveal that digitalization cannot be understood as linear and top-down modernization processes. Rather, it is an imperceptible movement that unfolds through situated adaptations, contested appropriations, and differentiated strategic reconfigurations. This analysis shows that digital infrastructures do not act as neutral reform instruments across jurisdictions and courts, neither do they impose a uniform model of justice. Instead, they become sites of situated transformation, embedding contrasting rationalities, professional strategies, and socio-technical arrangements, while simultaneously (co)producing new forms of coordination, practices, legitimacy, and power relations. As such, they do not produce a unique, unified 'digital justice,' but rather participate in the emergence of multiple, fragmented *digitalizations*. This perspective aligns with foundational insights from the sociology of justice, which emphasize that justice itself is not singular but inherently plural and tension ridden. Rather than functioning as a single hierarchical apparatus, justice constitutes a space where heterogeneous rationalities, actor positions, and temporalities coexist — and often collide.

This internal plurality has been conceptualized in different but complementary ways. Among the many possible approaches, one emphasizes the coexistence of distinct institutional logics — jurisdictional, bureaucratic, and professional (Delpeuch et al., 2014) — each with its own norms, legitimacy claims, and modes of coordination. These logics not only shape judicial functioning but frequently clash in periods of change. Another perspective, articulated by Vigour (2018), focuses on the divergent universes of reform inhabited by different categories of actors: political and administrative reform entrepreneurs, justice administrators and middle managers, and judicial practitioners such as judges, clerks, and lawyers. These universes are defined not only by their reform agendas but also by their contrasting temporalities. While political actors operate under time pressure — driven by electoral cycles, media visibility, and the pursuit of immediate results — judicial practitioners engage with reform through slower, more deliberative rhythms oriented

toward procedural stability and jurisprudential development. This temporal asymmetry is clearly observable in this thesis: while the deployment of digital tools often follows a rapid logic linked to reform waves, their appropriation unfolds more gradually and selectively within professional practice.

Just as justice cannot be reduced to a single, stable institution, its digital transformation follows no singular path. Instead, digitalization unfolds through multiple, situated configurations. This fragmentation is materially traceable in the three digital infrastructures examined. *MaCH* reflects the imprint of a politically and administratively driven universe, structured around performance and rapid case processing. Yet it encounters resistance and friction from judicial practitioners who reintroduce their own priorities and hierarchies into the system's use. *RegSol*, co-constructed by public and private actors, embodies a negotiation between standardization and legal expertise — one that remains contested and unresolved in everyday practice. *juriDict*, by contrast, is more closely aligned with the professional logic, reinforcing internal legal knowledge and stabilizing expert-driven categories of reasoning. Far from smoothing out existing tensions, digital infrastructures participate in their reproduction, displacement, or reconfiguration. They become terrains where competing rationalities are materially encoded, resisted, or reinterpreted. Across the three tools examined, these tensions are not abstract but enacted through user interfaces, workflows, scripts, classification systems, and even through technical malfunctions and local workarounds that expose deeper misalignments. In this sense, digital infrastructures function as sites of co-production, where ways of knowing and ways of doing justice are mutually shaped (Jasanoff, 2004). They provide a lens through which the broader meaning of digital transformation can be rethought not as a linear modernization process, but as the contingent and contested outcome of interactions between technical design choices, professional practices, organizational arrangements, and innovation logics. Methodologically, this underscores the value of approaching digital infrastructures as situated objects of study: they make visible the heterogeneous, contested, and plural nature of digitalization processes in justice.

4. Beneath the surface: Interpreting the (digital) transformation(s) *in* justice

After tracing the plural, fragmented ways in which justice is being digitalized, the final part of this discussion steps back to ask: what do these *digitalizations* actually reveal about transformation in justice? Not in terms of official discourse or policy goals, but in terms of how change is enacted, negotiated, and resisted on the ground. What remains when the noise of reform announcements fades? What happens in the spaces between intention and implementation? This section explores these questions by contrasting the dominant reform narrative with the more subtle, less visible processes infrastructures make tangible: frictions, slowness, invisible work, and the quiet shifts that reconfigure justice in unexpected ways.

4.1. The illusion of reform waves

The fragmentation and plurality outlined throughout this thesis is often compressed rhetorically and politically into the language of reform waves that dominate the modernization discourse. Within these narratives, reforms are often presented as linear, necessary, inherently progressive and the best response to systematic dysfunctions. They emphasize acceleration, rationalization, and improvement (Borot, 2001), giving the impression that change moves in one clear direction: "the digital transformation *of* justice." This framing conceals much. By presenting reforms as successive "waves" of modernization or digitalization, it flattens institutional diversity and downplays the tensions, contradictions, and negotiations that shape how change unfolds in practice. The wave metaphor itself is revealing: widely used in public management discourse (Yoo et al., 2010), it evokes power, inevitability, and forward motion. It creates an impression of coherence and progress, even when reforms are fragmented, conflictual, or uneven. But the image also does a lot of conceptual work: it renders fragmentation less visible, mask frictions, and downplays the diversity of actors, practices, and institutional arrangements involved.

In contrast, the analysis developed in this thesis reveals digitalization as a layered and uneven set of transformations, animated by situated practices within courts that remain invisible from a top-down perspective. These changes are not simply digital, but socio-technical, organizational, socio-political, and professional that unfold through the mediation of digital infrastructures. The plurality

of *digitalizations* observed makes clear that beneath the surface of formal reform narratives, the justice system is in constant motion — not in a single direction, but through multiple, sometimes conflicting trajectories. It is precisely by attending to these micro-processes — frictions, adaptations, and appropriations — that we can grasp what escapes the modernization discourse: subtle, distributed, and often contradictory institutional movements. To capture this misalignment — between the official reform narrative and the situated plural ground-level realities — this thesis mobilizes the concept of the digital undertow.

4.2. What hides beneath the waves of reforms? Introducing the digital undertow

Originally proposed by Orlikowski and Scott (2023; 2022), the concept of digital undertow offers a compelling counterpoint to the dominant image of visible, powerful, and relentless waves of reform. Borrowed from oceanography, an undertow refers to the hidden, backward-pulling currents produced by and moving beneath incoming waves. Whereas waves dramatize the visible and celebrated aspects of reform, undertows move in relation with them but capture the quieter, less visible movements beneath these waves. In organizational terms, it designates the invisible yet consequential forces that shape institutions over time — not through formal announcements or top-down plans, but through accumulated frictions, unnoticed shifts, and infrastructural realignments. While earlier work has described the unintended consequences of technological change through notions like drift, emergence, or side effects (Akrich, 1987; Barley, 1988; Bowker & Star, 1999; Latour, 1990; Suchman, 2007; Winner, 2007), the concept of the digital undertow brings a sharper focus to how these "corollary effects" unfold *through* infrastructures — quietly, gradually, and often unnoticed. By tracing how embedded standards begin to lose correspondence with the realities they aim to coordinate and regulate (Scott & Orlikowski, 2022, p. 332), the digital undertow identifies the specific conditions and processes through which institutional norms are gradually and often unwittingly transformed by digitalization efforts (Scott & Orlikowski, 2022).

These corollary effects remain largely overlooked because they tend to materialize at some temporal and spatial distance from the focal point of reforms — surfacing not in the immediate rollout, but in the slow sedimentation of new routines, scripts, and meanings (Orlikowski & Scott, 2023). They occur, for instance, when a system forces a case into a pre-set category that does not

quite fit, when a professional relies on a tool's alerts instead of legal judgment, or when platform logics become so embedded that users take it for granted. In this thesis, the digital undertow is used to interpret the layered, situated socio-material processes observed across the three empirical cases. It captures the frictions, tensions, and dysfunctions embedded in infrastructures that shape judicial practice. From this perspective, digital transformation emerges as a layering of subtle undertows that, at times, generate institutional displacements, whose effects only become visible through detailed empirical inquiry.

4.3. The digital undertow at work: three institutional displacements in judicial settings

The following analysis highlights three such displacements that recurred across the empirical cases, each illustrating how infrastructures quietly reshape the normative fabric of justice. These displacements unfold quietly, embedded in digital infrastructures and the day-to-day routines of judicial actors. As defined by Orlikowski and Scott (2023), they emerge when existing norms, routines, and institutional expectations lose correspondence with the situated practices and socio-technical arrangements through which justice is enacted. In these moments of misalignment, new standards, logics, and modes of coordination begin to sediment — often without being explicitly named or debated. These displacements take shape within a broader transformation of the institutional environment. Judicial professionals increasingly operate at the intersection of overlapping and, at times, conflicting normative orders. The jurisdictional, bureaucratic, and professional logics described by Delpeuch et al. (2014) persist, but a fourth logic — embedded in digital infrastructures — has taken shape. This digital layer sometimes reinforces existing norms but often reshapes or silently overrides them. What emerges is not merely a "double standardisation" (Contini & Reiling, 2022), but a hybridization of normativity in which jurisdictional, bureaucratic, professional, and digital logics intersect, overlap, and at times contradict each other. Digital systems interact with all pre-existing logics, which alters the very conditions under which the displacements arise, creating a fragmented, evolving terrain that subtly steers how law is interpreted and applied. The following section highlights three displacements that recur across the empirical cases, each illustrating a register through which infrastructures subtly reshape the judicial institutional environment: professional, normative, and political.

4.3.1. Reconfiguration of professional discretion

The first institutional displacement arises through the ways digital infrastructures reconfigure professional discretion: the capacity for actors to interpret, decide and act within the boundaries of their institutional roles and organizational rules (Crozier & Friedberg, 1977). Traditionally, judicial work has relied on interpretive judgment, situated reasoning, and the ability to navigate ambiguity and competing priorities (Contini & Fabri, 2001; Dubois & Schoenaers, 2019). Yet the embedding of digital tools increasingly mediates and constrains these decisions at the level of practice. Legal actors still have agency, yet their margins for manoeuvre are increasingly shaped by systems that embed their own normative logic. Justice, already under pressure from organizational and managerial imperatives (Vigour, 2018), finds itself pushed even further into heteronomy by the built-in assumptions of the digital tools themselves. What was once left to professional interpretation is increasingly pre-classified, flagged, or even automated.

Importantly, most judicial professionals were not formally trained to use these systems. Instead, they had to appropriate them through trial and error, informal exchanges, and peer support. This self-learning process contributes to the reconfiguration of professional discretion: knowing who to call when the system blocks, "working around" a limitation, or finding a shortcut become a new form of practical expertise (Eyal, 2013). Discretion now includes navigating, adapting to, and occasionally subverting the logics embedded in tools. As a judge from Court Alpha explained, *"Now, we click for every operation"* (Magistrate June 2022, Court Alpha). Another magistrate reflected that *"while certain work practices, like the disjunction of a case, are materially, intellectually, and legally feasible, MaCH does not permit these manipulations"* (Police court judge, October 2022, Beta Court). These remarks illustrate how the tools gradually reshape the exercise of discretion. In *MaCH*, automation gradually changes what counts as proper legal procedure: what is escalated or ignored depends not only on legal interpretation but also on the system design. In *RegSol*, predefined workflows and interface restrictions make some actions possible only at specific moments and in prescribed forms. Even *juriDict*, which appears to empower professional reasoning, channels users through fixed categories of legal classification. Judicial professionals (magistrates, clerks, lawyers, legal attachés) remain decision-makers, but the terrain of decision-making has changed. How far can an individual judge still exercise judgment once the interface has pre-classified, flagged or automated parts of the case? How can

clerks mobilize their procedural expertise when workflows and validations determine the rhythm, order, and legitimacy of their actions? Digital tools narrow those opportunities. Practitioners are often caught in a "choice architecture" that nudges their behaviour: reminders, pre-filled templates, locked-in categories, or system-enforced sequences. Discretion is thus reshaped by what the system allows, encourages, or foregrounds.

This leads judicial actors to navigate between multiple normative orders depending on the context (Delpeuch et al., 2014). Some follow the tool's logic — accepting the automated classification of cases, the alerts, the workflow structure — while others try to resist or bypass it, to reassert their own sense of priority or relevance. In these moments, actors are not just choosing how to act, they are choosing between normative systems: between what the tool suggests, what the law prescribes, and what their professional judgment deems right. This creates a kind of forum shopping (Von Benda-Beckmann, 1981) — not between different legal systems or institutions, but between legal and coded logics, between standardization techniques and juridical autonomy. Actors mobilize these norms and sometimes strategically choose one over the other in order to obtain the most favourable outcome for their case. What makes this professional institutional displacement particularly significant is its invisibility. These navigations between normative orders do not appear in the official architecture of the justice system, yet they are lived daily by those who make it work. Professional discretion persists, but in a reconfigured form: situated within infrastructures that both constrain and silently reshape its scope.

4.3.2. Redefinition of what counts as "good legal work"

The second institutional displacement arises from the ways digital infrastructures redefine what counts as "good legal work" and how it is measured, valued, and legitimized. Tools like *MaCH* and *RegSol* are often framed as technical responses to practical problems — automating reminders, organizing workflows, or standardizing procedures. Yet behind these technical solutions lie much deeper transformations (Vigour, 2018). These tools quietly reconfigure the very meaning of efficiency, timeliness, and procedural adequacy. They do not just track work; they help define what counts as work well done. As a chief clerk explained,

> "*RegSol* uses a color code to know who has to act and who must do what. The people involved in the bankruptcy procedure receive reminders from *RegSol*; they appear in red if

> they are late, and then we can see who is delayed, who takes how long to process their files. It really pushes them to do things quickly because no one wants to be in red" (Court Gamma, May 2022).

This scene illustrates how the tool transforms the "good completion of a task" into a visible and comparable metric, thereby encouraging conformity with system-defined standards of timeliness and diligence. What looks like optimization is, in fact, a redefinition of normative benchmarks of professional conduct and public action, without necessarily making those changes explicit or open to discussion (Baudot, 2015; Lascoumes & Simard, 2011; Williamson, 2016). Judicial practitioners are increasingly held accountable to system-generated metrics and procedural expectations rather than peer judgment or deliberative criteria. Over time, these technical expectations become proxies for professional performance, reconfiguring how value and legitimacy are distributed in everyday practice. In that sense, infrastructure becomes political through normative means — even if it rarely presents itself that way. This happens through interfaces, workflows, dashboards, and timelines embedded in the tools. These features introduce implicit expectations into the everyday work of justice actors. In *MaCH*, for instance, the automation of tasks subtly imposes a specific rhythm on judicial work — one that does not always align with the deliberative pace valued by magistrates. *RegSol*, through its rigid input fields and submission protocols, standardizes what is considered a "proper" file, leaving less room for local adaptations or legal nuance. Yet "good work," is deeply situated. What seems efficient for a clerk might not be so for a lawyer or a judge, and what works in one court or procedural phase may not apply in another. Despite this "good work plurality," the digital tools tend to encode one specific version of what "work well done" should look like. What gets tracked gets valued. What is visible to the system becomes the standard. In doing so, these tools do not just support new ways of working — they quietly redefine what it means to "work well," what should be done, when, and how. As a result, legal actors may find that their work is increasingly governed not by law or professional norms alone, but by the socio-technical-political scripts embedded in the tools they use (Akrich, 1991; Lascoumes & Le Galès, 2005), often in ways that remain unspoken and unquestioned. This constitutes a normative institutional displacement, through which digital infrastructures silently reshape the criteria of legitimacy, value, and professional worth within the justice system.

4.3.3. Dispersion of authority and redistribution of power relations

The third institutional displacement arises when authority is dispersed across new socio-technical arrangements, producing asymmetric dependencies for judicial actors. In Belgium's characteristically fragmented decision-making landscape, authority has always been relational, circulating among judicial actors, administrative bodies, intermediary institutions, and professional groups — even before digitalization. What the empirical cases reveal, however, is that digital infrastructures reconfigure this relational structure by inserting new gatekeepers and "obligatory passages" (Callon, 1984): private firms who maintain *MaCH*; an external consultant called to unblock *juriDict*; Bar Associations that stipulate *RegSol* workflows; and software code that silently enforces procedural rules. These actors and artefacts collectively shape what is possible, permissible, and visible in judicial practice. In this sense, infrastructures actively participate in redefining who has the authority to decide, and under what conditions — sometimes in tension with the principle of judicial independence and decisional autonomy. Rather than a top-down erosion of control, as described by Bastard and Ackermann (1993) in contexts where the state is outpaced by innovation, what emerges here is a more intricate re-composition of authority through distributed socio-technical systems.

Each node in the network is mutually interdependent, such that a change or failure in one component ripples across entire workflows (Akrich et al., 2006). Authority therefore becomes harder to see, contest, or steer — no longer anchored solely in legal texts or ministerial decrees but embedded in opaque infrastructures and commercial service agreements. This dispersion of authority also entails a growing, opaque, dependence on these distributed networks. Courts now increasingly rely asymmetrically on external systems and actors — technical, legal, and organizational — whose workings are not always visible or aligned with judicial norms.

As authority is formally dispersed, power is informally and relationally redistributed — along with the forms of expertise that sustain it — through the new dependencies and negotiations that arise within systems of interdependence (Akrich et al., 2006; Faulconbridge et al., 2021). As one chief clerk recounted, *"You call the AX'OP hotline, wait several minutes on the phone, only to reach someone who doesn't understand the tool"* (Beta Court, September 2022). A registry staff member pointed out that, *"They didn't develop the option to grant access to consular judges in RegSol, so*

we have to print them the documents for them to work" (Gamma Court, June 2022). These episodes illustrate how judicial actors must now negotiate with other professional groups, customer service, and technical design, and bargain for the very conditions that allow them to work (Abbott, 1988; Faulconbridge et al., 2021). In many cases, such negotiations occur without formal guidance or training, leaving professionals to rely on improvised solutions and informal know-how, and learning as practice-in-context. When tools malfunction or update, entire routines must adapt. When back-end processes are modified by developers, practitioners recalibrate their work accordingly.

In practice, then, the justice system unfolds within a plural, infrastructurally mediated legal landscape. Classical sources of authority are entangled with the agency of platforms, code, and the tacit decisions of developers or intermediary bodies. Absent from official reform narratives, these actors nonetheless play a central role in shaping judicial work. What emerges is a fragmented and shifting terrain in which both authority and power relations are continually renegotiated, and judicial autonomy routinely questioned. This amounts to a political institutional displacement and a mode of steering public action in which heterogeneous actors constantly rebalance influence among themselves, silently redistributing practices, standards, and possibilities for action (Crozier & Friedberg, 1977).

Across the three displacements, the most immediate and consequential effects are borne by judicial actors, whose institutional environment is progressively reshaped through socio-technical arrangements they must navigate, adapt to, and occasionally contest. Taken together, these displacements unfold across three complementary registers of institutional change: the professional, which reconfigures how actors think and decide in practice; the normative, which redefines what counts as legitimate or valuable; and the political, which redistributes authority and power relations across new networks of socio-technical interdependence. Through these intertwined transformations, digital infrastructures subtly redefine professional practices, restructure organizational relations, and blur boundaries of expertise — producing uncertainty about applicable norms, frustration with rigid workflows, and dilemmas between legal reasoning and digital expectations.

4.4. Beneath the "digital"

Across the empirical cases, digital infrastructures generate movements that are cumulative, multidirectional, and opaque, which invites closer attention to the temporality, plurality, and complexity of these changes. Building on Orlikowski and Scott (2023) formulation, we argue that while the digital undertow metaphor remains useful to capture the silent, backward-pulling effects of "digital reform waves," the dynamics observed in the cases suggest that it can be extended in three complementary ways.

First, undertows are not merely a countermovement triggered by a single reform wave but cumulative processes. The cases show that they unfold *before*, *during*, and *after* official reforms. They do not follow the rhythm of political agendas but their own socio-material temporality. At times, multiple successive waves combine to generate and reinforce a single undertow, leading sometimes to institutional displacements; at other times, a single reform wave leads to divergent undertows that reverberate over time like ricochets. Often, both dynamics coexist. *MaCH* illustrates this ongoing process: long after its initial rollout, new modules and workflows are integrated, staff adapt, invent workarounds, and continuously renegotiate the system's meaning — sometimes aligning with reform objectives, sometimes diverging from them. Such iterative reconfigurations show that digital undertows are not reactions but continuations — processes through which infrastructures and actors keep adjusting to one another. These transformations are gradual, accretive, and never finalized: they sediment through practice.

Second, these digital undertows rarely flow in one direction, like a backwash of reforms. They resemble multiple, partially overlapping currents**,** moving at different paces and conflicting directions. They should be understood as co-constitutive movements that shape what reforms become or not in practice. Digital infrastructures and actors absorb, redirect, and sometimes amplify reforms through the micro-adjustments of everyday work, generating their own trajectories. Clerks re-sequence procedures to keep systems functioning; lawyers adapt their reasoning to data classifications; IT staff translate professional demands into new scripts. This makes the digital undertow a medium of ongoing institutional movement — through which norms are negotiated, reinterpreted, or quietly re-inscribed as they often carry frictions, introduce vulnerabilities, and produce unforeseen constraints. The movement is relational and messy,

resulting from small corollary effects that build up, sometimes without anyone noticing. Digital undertows, in this sense, are sites of translation. They show how technical, organizational, professional and political logics intertwine — how reforms acquire concrete meaning as actors collectively reinterpret, domesticate, or circumvent infrastructures. Digital undertows embody the slow, reciprocal work through which infrastructures and institutions re-shape one another.

Finally, what these movements obscure is as important as what they reveal. As infrastructures subtly govern what is sayable, doable, and legitimate within legal practice, they contribute to the erosion of this normative transparency. Legal settings are known to have norms that are explicit, traceable, contestable, residing in legal codes, jurisprudence, and professional deliberation. In digitalized settings, new norms increasingly operate through tools, scripts, dashboards, and workflows, often without being made visible as such. Normativity is no longer primarily debated, it is encoded, stabilized through technical decisions that become difficult to interrogate. Practitioners are often unaware of where decisions are made, which assumptions are coded in, or how categories are enforced. They must navigate systems that exert silent but persistent normative pressure, even when these pressures conflict with professional judgment or legal reasoning. The digital undertow, then, is not just a silent pull but a condition of opacity, a mode of steering public action that reshapes institutions quietly, gradually, persistently, and without formal debate. This erosion of normative transparency makes these displacements harder to see and harder to contest. Judicial professionals may not even perceive that the normative frame has shifted until their usual practices no longer "fit" the new system. As tools begin to (co-)define not just how law is applied but how it is recognized, interpreted, and made actionable, the normative core of justice becomes increasingly opaque and coded.

In this light, the digital undertow concept remains indispensable, yet the empirical cases demonstrate that it unfolds in more intricate, heterogeneous, and multidirectional ways than its initial formulation allows. What this thesis ultimately reveals is that the transformations associated with digitalization in justice cannot be reduced to a single, coherent "digital transformation." The granular, situated, empirical inquiry of infrastructures shows something more nuanced: plural *digitalizations*, situated in specific courts, generating professional, normative, and political displacements. Innovations are the prism through which these invisible transformations can be made visible. In this sense, digital infrastructures are both sites and actants of co-production, where

reform imaginaries and socio-technical arrangements come together to shape the ongoing becoming of justice. They underscore that ways of knowing and ways of doing justice are inseparable: visions of what justice ought to be and modes of knowledge about how it operates are mutually shaped through the infrastructures that sustain everyday practice (Jasanoff, 2004). By moving beyond the surface of "digital change," this thesis opens the discussion and offers a vocabulary for grasping how contrasting judicial settings are quietly, materially, and collectively redefined beneath the digital.

GENERAL CONCLUSION

Over the past three decades, the Belgian justice system has navigated through successive “waves” of organizational, managerial, and digital reform attempts, each promising to modernize institutions long criticized for their inertia. From the post-Dutroux programs to today's prevailing "digital by default" philosophy, these so-called waves of reforms primarily refer to a political discourse. Yet beneath this rhetoric of disruption, everyday experiences of judicial practitioners have rarely been transformed at the pace or in the manner proclaimed by official narratives. Many initiatives launched since 1999 survive mainly as texts on paper, their practical uptake stalled by shifting coalitions and short funding cycles. What remains, beneath the succession of acronyms and platforms, are infrastructures that are constantly in the making, often misaligned with professional realities, and frequently being reshaped before they can fully take root. Digitalization, therefore, unfolds less as a neat rupture than layered sedimentation of practices and technologies**,** entangled with older routines, material legacies, and organizational fragilities. It takes shape through the continuous weaving of socio-material practices and infrastructures, in which diverse actors engage in the pragmatic work of making justice function. This thesis aimed to depict precisely these incremental, cumulative processes by exploring how digital innovations interactively shape — and become shaped by — practices across contrasting Belgian judicial settings. It also examined what their infrastructural embedding reveals about the broader dynamic of “digital change” within these settings. The study adopted a collective and iterative case study design focusing on three distinct tool-jurisdiction pairs: *juriDict* at the Council of State, *RegSol* in commercial courts, and *MaCH* in police courts and prosecution offices. Each pair illuminated distinct, situated ways in which infrastructures take form and circulate within judicial institutions. By combining four complementary analytical perspectives drawn respectively from Science and Technology Studies and from the sociology of organized action, public action, and professional groups, this thesis has shown how socio-technical and socio-political scripts are inscribed in digital tools, quietly reshaping collective practices and prompting practitioners to renegotiate the boundaries of their expertise. What emerges strongly is that change materializes slowly, through processes of gradual sedimentation, and that digital innovations and practices within Belgian judicial settings are mutually constituted and contextually reconfigured. Yet these rearrangements are never homogeneous. Building on these empirical foundations, this thesis conceives “digital

transformation" not as a unified, linear phenomenon, but as a constellation of plural, layered, and situated forms and logics of digitalization. Hence, digitalization does not yield a single "digital justice" but fragmented, context-specific assemblages of contrasting judicial settings.

By mobilizing the concept of the digital undertow (Orlikowski & Scott, 2023; Scott & Orlikowski, 2022), this analysis reveals how these changes — or corollary effects — emerge silently, cumulatively, and institutionally rather than through programmatic, explicit design and reform. They unfold in discontinuous, partial, and pragmatic ways, continually negotiated among multiple actants such as legal professionals, developers, administrators, and digital tools. Far from being residual, these changes are constitutive of how justice is being recomposed. By tracing these digital undertows, the thesis makes visible the broader transformation of the judicial normative environment, showing how infrastructures quietly displace established institutional norms while official narratives play out on the surface. Across the empirical cases, these transformations take shape through three key institutional displacements, each deeply affecting front-line judicial practitioners.

These three institutional displacements can be understood respectively as professional, normative, and political. The first displacement concerns how actors think and decide in their daily work, hence, how professional discretion is exercised and delimited. Judicial work has always involved navigating ambiguity and balancing competing priorities (Dubois & Schoenaers, 2019), yet the embedding of digital tools increasingly mediates and constrains these decisions. Interfaces now pre-classify files, workflows automate procedural steps, and algorithmic nudges flag priorities. These changes do not eliminate discretion but reallocate it. It becomes distributed between judicial practitioners and infrastructures that carry their own normative logic (Akrich, 1991; Lascoumes & Le Galès, 2005), narrowing the room for situated judgment and shifting the practitioners' daily question from *"What is my interpretation and decision about this case?"* to *"How can I make sense of this case through what the system imposes?*" The second displacement concerns what counts as legitimate or valuable, hence, the criteria of "good legal work." Definitions of "work quality" are subtly reconfigured as dashboards prioritize managerial metrics, automated reminders set the rhythm, and rigid data fields replace legal nuance with template compliance. Where judicial work once rested on interpretive depth, peer deliberation, and procedural rigour, new performance indicators now elevate speed, traceability and quantification instead. Though presented as neutral,

these metrics participate in redefining the normative order of justice. They introduce new hierarchies of value — like efficiency over reflection — sometimes at the expense of deliberation or fairness. This displacement quietly shifts the practitioners' daily question from *"How can I do justice well?"* to *"How can I do justice in a way the system will recognize as efficient and compliant?"* while reshaping how professionals understand the meaning and purpose of their work. The third displacement concerns who decides and under what conditions, hence, the dispersion of authority and the redistribution of power relations across socio-technical configurations (Crozier & Friedberg, 1977). Courts now rely on private firms, software updates, and intermediary bodies whose operational logics are not always visible, nor aligned with judicial norms. These actors and infrastructures become obligatory passages (Callon, 1984), introducing new forms of dependency and fragility. Decision-making is redistributed across opaque networks of socio-technical interdependence (Akrich et al., 2006) that judicial professionals must conciliate, consult, or wait upon. In this reconfiguration, authority becomes infrastructurally mediated, while power circulates through asymmetric dependencies that are as much technical as organizational. Authority remains formally intact, yet in practice the ability to act or to decide depends increasingly on one's capacity to interpret, access, and maintain the systems — and the actors — through which justice is enacted. This shifts the practitioners' daily question from *"How should I perform this task within my mandate?"* to *"Whom and what must I rely on to make the system function so that justice can proceed?"* Taken together, these institutional displacements show that the transformations highlighted by digital innovations are not in themselves "digital." They unfold across professional, normative, and political registers, where discretion, legitimacy, value, authority, and power relations are subtly redefined — changes that both stem from and extend into organizational and socio-technical arrangements. Justice is not only administered differently (Mununguu Lungungu & Falla, 2014), it is continually negotiated in practice, within and through the infrastructures that sustain it.

Where, then, do these findings leave us? If the transformations in justice emerge not simply through "digital" itself, but through layered practices, local adaptations, and institutional displacements, the essential task is perhaps no longer to prescribe yet another modernization or digitalization program but to interpret what reforms become in practice. Across the three case studies, digitalization appears less as linear progress than as processes of institutional re-

composition. What is considered "modernization" within public policy is, in fact, the subject of constant negotiation among actors in their everyday work. Questions such as *who relies on whom, to do what, when, and how work is collectively accomplished* are continually re-negotiated by those who work on, for and with digital infrastructures. They do not simply implement reform; they materialize and translate it into new routines, categories, and dependencies. In this sense, they change not only *how* modernization is achieved but *what* modernization means. Hence, digitalization is socio-technical, organizational**,** socio-political, and professional before it is "digital." Its sediments quietly through infrastructures, often beneath the radar of reform narratives.

Where, then, are practitioners left in this process? How long can reform cycles be repeated without exhausting those tasked with their implementation? Under what conditions might digital tools truly become sustainable components of the judicial work? Will judicial actors continue to "play along," despite mounting inconsistencies and contradictions within these systems? Working on, for and with these systems requires new forms of collaboration and timing: knowing who to call when a platform freezes; how to circumvent a blocked step without violating procedure; how to keep consistency when categories and menus evolve faster than the rules they are meant to serve. For many practitioners, this is not a story of innovation but of usure: the slow wear of daily adjustments through which infrastructures are made to work. It demands learning, unlearning, and relearning systems that rarely stabilize; compensating design flaws through bricolage (Fuglsang, 2010); and integrating tools into worlds they were not trained and "built" to understand. The boundary between professional commitment — to justice, to people, to meaning — and exhaustion increasingly blurs (Lawson, 2025; Stroobants, 2025).[74] Innovation and wear, engagement and learning, coexist in the same gesture: keeping justice operational through fragile infrastructures (Rubio et al., 2025). Over time, decades of unfinished reforms, partial digital deployments, and the relentless demand that professionals adapt, patch, and "make it work" make each new change harder to absorb and accumulate into institutional fatigue and disillusionment (Schiffino et al., 2023). What endures is a form of institutional amnesia, where each new reform forgets the limits,

[74] For several years, Belgian judicial actors — judges, clerks, court staff, and professional unions — have repeatedly issued public warnings about delayed digitalization, structural underfunding, and the deterioration of technological infrastructures in the courts. Despite these recurrent mobilizations, their concerns have largely gone unheard. The current government, led by Bart De Wever (since February 2025), appears to perpetuate this logic, with several professional associations denouncing the continuation of a policy of promises without resources and warning of a justice system they describe as "asphyxiated" by human, material, and digital shortages.

tensions, and frictions of the previous one (Goldfinch, 2007). Laws may be formally adopted yet thinly resourced or inconsistently enforced, producing paradoxical half-measures that deepen the burden on those who must operationalize them (Vigour, 2018). Professionals are thus left to carry the continuity of justice on infrastructures that too often remain brittle, unstable, and only partially cared for.

On one hand, policymakers continue to call for rapid modernization; on the other, judicial practitioners question its effects on their work, their professional practices, the functioning of justice, and the very purpose and sustainability of these innovations. Such tensions resist prescriptive answers. Addressing them requires acknowledging the coexistence of multiple temporalities: not only the "faster, bigger, newer" pace of innovation, but also the slower rhythms of what is lasting, adaptable, and repairable. Yet too often, the lessons drawn from successive reforms remain at the surface — focused on performance indicators, deadlines, and compliance — governed by what might be called innovation time: the temporality of projects, releases, and replacements. Beneath these visible cycles of innovation, however, infrastructures inhabit other temporalities — those of care, adjustment, maintenance, and repair — many of which remain invisible in policy and design discourses (Rubio et al., 2025). Durability does not come from successive launches but from the slow, situated work that keeps systems functioning amid constraints, updates, and frictions. Institutions, in this sense, endure not despite fragility but through it (Denis & Pontille, 2022; Star & Ruhleder, 2010). Recognizing this requires aligning reform time with maintenance time: designing funding, governance, and evaluation frameworks that make space for upkeep, repair, and deliberation, rather than treating them as invisible costs. Public institutions are structurally inclined to privilege design and development — visible acts of innovation — while maintenance remains undervalued, fragmented across separate envelopes, and chronically underfunded (Russell & Vinsel, 2018).

Being attentive to this ambivalence calls for a different posture toward "digital change:" not continuous waves of reform, but an attentive slowing down. Slowing down is not about resisting innovation; it is about creating the conditions to see, question, and deliberate how digital infrastructures reshape justice — and, reciprocally, how justice reshapes them. For researchers, this means following the micro-practices of keeping systems working and treating these gestures as analytical entry points rather than residual noise. This thesis therefore reaffirms the irreplaceable

value of situated empirical inquiry and fine-grained case studies: the seemingly marginal frictions and dilemmas we observe are not accidental or residual; they are the very mechanisms through which infrastructures take root. Employing an abductive, action-centred lens made it possible to trace material-semiotic pathways — who designs a tool, how interfaces are configured, which legal categories are coded, how a clerk's workaround mutates into accepted routine. Tracing these informal, context-bound processes revealed institutional displacements that remain invisible in broader, programmatic narratives. Only by following digital innovations *in practice* can we access these hidden transformations.

For court administrators, slowing down means creating temporal and organizational space for actors to deliberate, adapt, and discuss unintended effects. It entails paying closer attention to the small acts of resistance, creative workarounds, and tacit compromises through which judicial practitioners keep justice operational. These subtle negotiations are critical to sustaining the delicate balance among diverse normative orders.

For policymakers, slowing down implies acknowledging that every technical adjustment carries normative consequences**,** and recognizing that institutions endure not through successive innovations but through continuous, attentive work (Rubio et al., 2025). It calls for a mode of steering that values reflexivity over speed and continuity over novelty, and that re-values the invisible work, temporal rhythms, and interdependencies that make justice possible in practice. The sustainability of infrastructures depends as much on their development, as on the maintenance practices that keep them alive (Denis & Pontille, 2022) — yet these practices remain chronically underfunded and undervalued. As the Belgian Court of Audit (2024) recently warned, the long-term viability of digital justice initiatives cannot be guaranteed under their current governance. Taken together, these perspectives invite a slower policy of maintenance — one that sees frontline workers as a diagnostic resource rather than an implementation problem, and that recognizes infrastructures as ongoing conversations among law, code, and practice. Such a policy of maintenance extends beyond the technical upkeep of digital systems. It also involves sustaining — and caring for — people, institutions, and justice itself. Maintenance, in this broader sense, means attending to the professionals who absorb reform fatigue, to the collective routines that preserve meaning amid instability, and to the fragile continuities that allow justice to endure. In

this sense, maintenance is not merely a technical concern; it becomes an ethical and institutional practice, grounded in attention, care, and endurance.

By continuously challenging techno-optimistic narratives, this thesis calls for "digital justice" reforms that are context-sensitive, reflexive, and critically attentive to situated realities, institutional dynamics, and professional tensions. In a judicial landscape marked by plural and contrasting forms of digitalization, reform coherence cannot be imposed. It must be continually negotiated across contexts and levels of practice, as an evolving architecture of coordination and reflexivity among diverse realities: a shared direction rather than a shared path. The Belgian experience underscores how essential it is to acknowledge the socio-material entanglements, infrastructural invisibilities, and quiet institutional displacements that characterize contemporary judicial modernization. Above all, this research emphasizes the need for collective inquiry capable of tracing how these delicate balances shift across software updates, budgetary cycles, and changing policy agendas. In showing how justice is quietly, materially, and collectively renegotiated beneath the digital, this work invites future research and policy to attend to the socio-technical negotiations through which justice continues to be made and maintained. In this light, digital infrastructures provide a vocabulary for rethinking change not as a unified "digital transformation," but as the ongoing co-production of justice through infrastructures. This manuscript therefore ends with a deliberate pause — a slowing down (Stengers, 2017). It signals attention to the in-between: the provisional, the misaligned, the quietly reconfigured. It calls for attention to the undertow, the invisible sedimentation of scripts, norms, and everyday practice. To take seriously the silent displacements that digital infrastructures produce in the normative environment of judicial frameworks, and to treat them not as side effects, but as the core of what is at stake: sustaining the conditions under which justice itself remains possible. To "slow down" the digitalization of justice is not to resist it, but to reflect deeply on the justice being co-produced — by whom, for whom, and at what cost. Ultimately, this work closes not with a verdict, but with an invitation: what if the modernization of justice meant learning to listen to what has already been lived, and continues to live, to wear, and to endure beneath and beyond the digital?

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APPENDICES

1. Interview guides[75]

1.1. Interviews at the Council of State

"Thank you for agreeing to meet with us and help with our research. We are trying to understand the digitalization at the Council of State, from Reflex and Juridict through to the electronic procedure, and to figure out how it all works. To do this, we would like you to describe four aspects: the origins of this digitalization process; your practical activities in setting it up and in the daily maintenance of the tools; the people you interact with in this context; and the problems you encounter both on a day-to-day basis and from a more structural perspective. You can address these topics in any order you like. We may occasionally ask for clarifications or explanations, as we are gradually learning about the subject. Please note that the content of this interview is both confidential and anonymous. This means we will not publish anything without first submitting it to you, while respecting your anonymity and adhering to our ethical principles. Would you agree to have this interview recorded?"	
Themes	**Sub-themes**
Possible opening questions / introduction of the interviewee	• Brief presentation • Professional background • Main aspects of the job • Most interesting/important aspects of the job
Genesis of the digitalization process	• Decision to publish rulings • Creation of Reflex • Creation of *juriDict* • Creation of the electronic procedure • Possible resistances
Concrete practices in tools developement and daily maintenance	• Role in developing the tools • Current role • Nature of the technology • Evolution of the technology used • Evolution of daily work • Evolution of professional practices • Evolution of the Council of State's practices
People with whom you interact in this context	• Who do you work with, or maintain regular contact with, in your job? • Most important relationships • Nature of these relationships

[75] Because the interview guides were adapted throughout the research period—taking into account the specific case studies and the varied profiles of interviewees—we consolidated all relevant themes and key questions into a single guide for each group of jurisdictions (Council of State, commercial courts, and police courts). Consequently, these guides do not include every sub-question, as those are highly specific, deeply rooted in the Belgian context, and closely tied to the real-world experiences of the actors. Instead, the guides focus on the main themes that were addressed.

Problems encountered on a daily and structural level	• Main problems faced • How these problems are resolved
Potential improvements	• How could the usefulness/efficiency of your work be enhanced? • In your opinion, what should be changed to improve overall operations?
Conclusion	• Additional points? • Remarks or comments • Acknowledgments • Reminder of anonymity

1.2. Interviews in commercial courts

"Thank you for taking the time to meet with us and help with our research. We are trying to understand the digitalization of the Commercial Court — specifically, the role played by IT and digital tools in your work and in the work of other stakeholder groups you collaborate with (court registry, public prosecutor's office, lawyers, administrative agencies, etc.). We want to learn about how you use these tools (such as *RegSol*, for example) and how they affect the organization of your work. Could you describe these tools, their characteristics (how long they have been in use, their functions, advantages, disadvantages, etc.), and the groups of people with whom these tools allow you to communicate, collaborate, and exchange information? We would also like to understand how these tools do or do not lead to changes in your work practices (simplification, redundancy, automation, time savings or losses, new skills, etc.). You can address these topics in any order you prefer. We may occasionally ask for clarifications or further explanations, as we are gradually becoming familiar with the subject. The content of this interview is confidential and anonymous, meaning we will not publish anything without first submitting it to you, respecting your anonymity, and following our ethical principles. Would you agree to have this interview recorded?"

Theme	Sub-themes
Possible opening questions / introduction of the interviewee	• Brief presentation • Professional background • Main aspects of the job • Most interesting/important aspects of the job
Contextualization	• Tools used by the commercial court • Standardization (or lack thereof) of these tools • Paper-based procedure • Progress of bankruptcy proceedings before the introduction of *RegSol* • Progress of other proceedings before the introduction of these tools
Genesis of the digitalization process	• Creation of the various tools • Stakeholders involved • Creation of *RegSol* • Stakeholders involved
Concrete practices in tools developement and daily maintenance	• Role in developing the tools • Current role • Nature of the technology • Choice of technology • Evolution of the technology used • Costs of *RegSol* • Maintenance of the tools • Internal database of court rulings

	• Management of the tools • Evolution of daily work • Evolution of professional practices • Progress of bankruptcy proceedings since the introduction of *RegSol* • Evolution of the Commercial Court's practices • Implementation of the May 5, 2019 law: publication of court rulings • Independence of the judge
People with whom you interact in this context	• Sharing of information • Who do you work with, or maintain regular contact with, in your job? • Changes in relationships brought about by digitalization
Problems encountered on a daily and structural level	• IT needs • Main problems faced • How these problems are resolved
Potential improvements	• How could the usefulness/efficiency of your work be enhanced? • In your opinion, what should be changed to improve overall operations?
Conclusion	• Additional points? • Remarks or comments • Acknowledgments • Reminder of anonymity

1.3. Interviews in police courts

"Thank you for taking the time to meet with us and help with our research. We are trying to understand the digitalization of the Police Court — specifically, the role played by IT and digital tools in your work and in the work of other stakeholder groups you collaborate with (court registry, public prosecutor's office, lawyers, administrative agencies, etc.). We want to learn about how you use these tools (such as *MaCH*, for example) and how they affect the organization of your work. Could you describe these tools, their characteristics (how long they have been in use, their functions, advantages, disadvantages, etc.), and the groups of people with whom these tools allow you to communicate, collaborate, and exchange information? We would also like to understand how these tools do or do not lead to changes in your work practices (simplification, redundancy, automation, time savings or losses, new skills, etc.). You can address these topics in any order you prefer. We may occasionally ask for clarifications or further explanations, as we are gradually becoming familiar with the subject. The content of this interview is confidential and anonymous, meaning we will not publish anything without first submitting it to you, respecting your anonymity, and following our ethical principles. Would you agree to have this interview recorded?"

Theme	Sub-themes
Possible opening questions / introduction of the interviewee	• Brief presentation • Professional background • Main aspects of the job • Most interesting/important aspects of the job
Contextualization	• Tools used by the Police court • Standardization (or lack thereof) of these tools • Paper-based procedure • Progress of civil proceedings before the introduction of *MaCH* (stages and timeline) • Progress of criminal proceedings before the introduction of *MaCH* (stages and timeline) • Progress of other proceedings before the introduction of these tools
Genesis of the digitalization process	• Creation of the various tools • Stakeholders involved • Creation of *MaCH* • Stakeholders involved
Concrete practices in tools developement and daily maintenance	• Role in developing the tools • Current role • Nature of the technology • Choice of technology • Evolution of the technology used • Costs of *MaCH*

	• Maintenance of the tools • Internal database of court rulings • Management of the tools • Evolution of daily work • Evolution of professional practices • Progress of criminal and civil proceedings since the introduction of *MaCH* • Evolution of *MaCH* • Evolution of the Police Court's practices • Independence of the judge
People with whom you interact in this context	• Sharing of information within and outside the court • Timeline of a file • Criminal chain • Role of *MaCH* • Who do you work with, or maintain regular contact with, in your job? • Changes in relationships brought about by digitalization
Problems encountered on a daily and structural level	• IT needs • Main problems faced • How these problems are resolved
Potential improvements	• How could the usefulness/efficiency of your work be enhanced? • In your opinion, what should be changed to improve overall operations?
Conclusion	• Additional points? • Remarks or comments • Acknowledgments • Reminder of anonymity

2. List of Interviews by case study

Studied Case	Date	Person interviewed/ actor category
Council of State (French-speaking part)	Jan 21	Expert/ Researcher
	Jan 21	Expert/ Researcher
	Mar 21	Practitioner: Chief Clerk
	Mar 21	Practitioner: Director
	Mar 21	Practitioner: legal advisor
	Mar 21	Lawyer
	Mar 21	Practitioner: Documentalist
	Apr 21	Lawyer
	May 21	Lawyer
	Jun 21	Actors involved in the digitization process: IT specialist
	Nov 21	Practitioner: Chief Clerk
Council of State (Dutch-speaking part)	Jun 22	Practitioner: legal advisor
	Jun 22	Practitioner: Documentalist
	Jun 22	Practitioner: Head of coordination office
	Jun 22	Actors involved in the digitization process: IT specialist
Alpha court	Nov 21	Practitioner: clerk (chief of service)
	Nov 21	Practitioner: President's assistant
	Nov 21	Practitioner: Chief Clerk
	Nov 21	Practitioner: Judge
	Nov 21	Practitioner: Judge
	Dec 21	Curator
	Dec 21	Lawyer
	Dec 21	Consular Judge
	Dec 21	Consular Judge
	Dec 21	Curator
	Dec 21	Actors involved in the digitization process: Bar Associations' administrators
	Jan 22	Actors involved in the digitization process: Corps commander
	Jan 22	Practitioner: Registry staff member
	Jan 22	Practitioner: curator
	Jan 22	Practitioner: Registry staff member
Delta Court	Jan 22	President
	Fev 22	Practitioner: clerk (chief of service)
	Fev 22	Practitioner: Certified Public Accountant
	Fev 22	Practitioner: Chief Clerk

	Fev 22	Practitioner: Division Presiding judge
	Fev 22	Practitioner: Registry staff member
	Fev 22	Practitioner: Registry staff member
	Fev 22	Practitioner: judge
	Fev 22	Practitioner: clerk
	Fev 22	Consular Judge
	Fev 22	Practitioner: curator
	Mar 22	Practitioner: curator
Gamma Court	May 22	Practitioner: Chief Clerk
	June 22	Practitioner: judge
	June 22	Practitioner: judge
	June 22	Practitioner: clerk (chief of service)
	June 22	Practitioner: Registry staff member
	June 22	Practitioner: clerk
Beta Court	Sept 22	Practitioner: Chief Clerk
	Sept 22	Actors involved in the digitization process: IT specialist
	Sept 22	Practitioner: Registry staff member
	Sept 22	Practitioner: Registry staff member
	Sept 22	Practitioner: clerk
	Sept 22	Practitioner: clerk
	Sept 22	Practitioner: clerk
	Sept 22	Practitioner: clerk
	Sept 22	Practitioner: Registry staff member
	Sept 22	Practitioner: Registry staff member
	Oct 22	Practitioner: Registry staff member
	Oct 22	Practitioner: judge
	Oct 22	Lawyer
	Oct 22	Lawyer
Beta prosecutor's office	Oct 22	Deputy prosecutor
	Oct 22	Deputy prosecutor
Epsilon Court	Nov 22	Practitioner: clerk (chief of service)
	Nov 22	Practitioner: judge
	Nov 22	Practitioner: judge
	Dec 22	President
	Dec 22	Practitioner: clerk
	Dec 22	Support and management attaché, College of Courts and Tribunals
Epsilon prosecutor's office	Dec 22	Deputy prosecutor
	Dec 22	Clerck at the prosecutor office
“Elites”	Fev 22	Federal magistrate

	Oct 22	Secretary of State for Economic Recovery and strategic investments
	Nov 22	ICT liaison Magistrate, College of Courts and Tribunals
	Dec 22	Deputy Director at Private Office of the State Secretary for Digitization, Privacy and Administrative Simplification

3. Observation overview table

Studied Case	Date	Observed situation
Alpha court	Nov 21	hearing of the dissolution chamber
	Nov 21	hearing of the pleading chamber
	Nov 21	hearing of the chamber for companies in difficulty
	Dec 21	Registry's work
Delta Court	Jan 22	Registry's work
	Fev 22	hearing of the chamber for companies in difficulty
	Fev 22	Introduction hearing of disputes between companies
	Fev 22	bankruptcy introduction hearing
Gamma Court	May 22	bankruptcy introduction hearing
	June 22	Registry's work
Beta Court	Sept 22	Registry's work
	Oct 22	Traffic criminal hearing
	Oct 22	Traffic criminal hearing
	Oct 22	Civil hearing
	Oct 22	Civil introduction hearing
Beta prosecutor's office	Oct 22	Registry's work
Epsilon Court	Nov 22	Civil hearing
	Nov 22	Traffic criminal hearing
	Nov 22	Registry's work
	Dec 22	Traffic criminal hearing
Epsilon prosecutor's office	Dec 22	Registry's work

4. Observation guides

Date: Place: Object: Attendees:		
Object	**Observation criteria**	**Observed facts**
The court Registry	**Who are the key actors?**	
	What do they do? What does their work involve?	
	How is the work distributed among them?	
	How does the procedure unfold?	
	What tools do they use? For what purpose? At what stage?	
	What are they trying to achieve through their work?	
	What are the interdependencies between the actors?	
	What are the main problems the actors face?	
	Potential issues/tensions between them ?	
	What is the role of the court clerk assistant?	
	Role of the court clerk	
	Description of the environment	
	General comments	
	What questions does this raise?	
	What to pay attention to next time?	

Date: Place: Object: Attendees:		
Object	**Observation criteria**	**Observed facts**
Hearing	**Organization before the hearing**	
	Number of cases handled / time per case	
	People attending	
	Case processing flow	
	Proceedings	
	Role of the judge	
	Role of the court clerk	
	Description of the environment	
	Tools used	
	Language and comprehension	
	Potential issues/tensions?	
	Interaction between professionals	
	Interaction with litigants	
	What happens after the hearing?	
	General comments	
	What questions does this raise?	
	What to pay attention to next time?	

5. Consent form

Consent Form for the Use of Personal Data in a Doctoral Thesis

[Ver. 1 - 20/01/2020 - Doctoral research carried out within the DiJusT project (PDR))

This form gives you all the information you need to decide, in full knowledge of the facts, whether you wish to take part in this study.

If you agree, please sign at the end of the form; we will give you a dated, signed copy. You may withdraw from the study at any time after giving consent.

Research lead
Scientific lead/ PhD candidate: PELSSERS Lisa.

Study description
The study pursues three objectives:

- Analyse — through case studies — how digital transformation unfolds over the entire life-cycle of judicial tools (design, development, maintenance, use)
- Reveal, via an actor-centred abductive approach, the socio-technical dynamics and organizational translations that reshape practices, roles and power relations within the Belgian justice system.
- Develop a transferable empirical and theoretical framework that clarifies the factors that foster or hinder court digitalization, while accounting for linguistic, organizational and contextual diversity across jurisdictions.
-

The research will run, unless extended, until the end of the 2024 academic year.

Protection of personal data
All necessary measures will be taken to guarantee the confidentiality and security of your personal data, in accordance with the *EU General Data Protection Regulation* (GDPR – 2016/679) and the Belgian Act of 30 July 2018 concerning the protection of natural persons with regard to the processing of personal data.

Data controller

The Data Controller is the University of Liège, whose registered office is located at Place du 20-Août 7, B-4000 Liège, Belgium

What data will be collected?

The data collected are:

- Contact details: e-mail address, telephone number.
- Personal data: age (date of birth), gender, degree, professional status, etc.
- Research data: career path, seniority, role, tasks, perceptions, relationships, etc.

Why are these data collected?

Your data will be used to complete the doctoral project described above. They may also be used — always anonymously — for related purposes such as scientific publications, conference presentations, teaching or any other activity that disseminates the results. Unless otherwise indicated, these data will be anonymized in the study's published results.
The findings will remain confidential: only the PhD candidate conducting the project, the academic supervisor (for scientific validation), and any authorized assistants will have access to the individual, contact, and research data.

How long and by whom will the data be kept?

Data will be kept until the thesis is completed and approved by the academic supervisor; storage may be prolonged for a few additional months to cover the purposes listed in § 3.
Data are stored exclusively by the PhD candidate under the supervisor's direction.

Collection and protection procedures

Data are gathered by the PhD candidate (principal investigator).

Digital data (audio recordings) are stored on the candidate's password-protected work computer and never sent by e-mail. If transfer is required, it will be done via the secure ULiège address (…@uliege.be).

Paper data (internal documents, field notes, interview transcripts) are kept at the candidate's home in a locked cabinet accessible only to the candidate.

All personal data are pseudonymized. The coding key that links identities to research data is encrypted in a separate digital file and will be destroyed at the end of the study.

Summary of the process

- Collect interview data; store contact details and responses in two separate files linked only by a code.
- During analysis, delete the coded contact file so that responses become fully anonymous; analyse with qualitative-data software (Corpus) or manual category coding.
- Draft the thesis using the pseudonymized responses.

Anonymisation or pseudonymization

Article 193-1 of the Belgian Act of 30 July 2018 on the protection of natural persons with regard to the processing of personal data requires that the data subject be informed whenever the collected data are anonymized or pseudonymized ("coded"). This anonymization or pseudonymization — meaning the data are no longer linked to a first and last name but to a code that only the PhD candidate and the supervisor can match to an identity — must be carried out as soon as possible (see example in § 5).

Personal and contact data are pseudonymized; the coding key is deleted once data collection ends. Research responses remain intact (under code) throughout the study.

Who can access de data?

Only the doctoral researcher conducting the study, the academic supervisor (to validate the scientific approach), and any authorised assistants will have access to these personal data.

Will data be transferred outside the University?

No. The data will not be shared with or processed by any third party.

Legal basis for processing

Processing is based on your **written consent**. By signing, you agree that the personal data specified in § 2 may be collected and processed for the purposes in § 3.

What rights does the data subject have?
As provided by the GDPR (Articles 15 to 23),with proof of identity, you may — at no cost —:

- receive a copy of your personal data and information on their use;
- have inaccurate data corrected and incomplete data completed;
- request erasure of your data, subject to legal conditions;
- restrict processing of your data, subject to legal conditions;

- obtain your data in a structured, commonly used format (data portability) where processing is based on consent or contract and carried out by automated means;
- withdraw consent at any time; this will trigger destruction of your personal data;
- lodge a complaint with the Belgian Data Protection Authority (https://www.autoriteprotectiondonnees.be, contact@apd-gba.be).

How to exercice these rights?

To exercise these rights, you may contact the University's Data Protection Officer either by e-mail (dpo@uliege.be) or by sending a dated, signed letter to the following address:

University of Liège
Data Protection Officer,
Bât. B9 Cellule "GDPR",
Quartier Village 3,
Boulevard de Colonster 2,
4000 Liège, Belgique.

Cost, remuneration and compensation

Your participation entails no costs and no financial remuneration or compensation.

Withdrawal of consent

You may withdraw at any time by informing the PhD candidate (contact above). Processing already performed remains valid. Data collected to date will not be deleted if that would make the research impossible or seriously impede it; you will be informed if this applies.

Questions about the research project

Please direct any questions to the PhD candidate (contact above).

I confirm that I have read and understood this three-page form and received a signed copy. I understand the nature and purpose of my participation and have had the opportunity to ask questions, which were answered satisfactorily. I freely consent to participate in the project.

Name:

Date:

Signature:

We are responsible for carrying out this research project. We undertake to respect the obligations set out in this document and to inform you of any change that might affect your consent.

Name of the academic supervisor:

Date:

Signature:

Name of the PhD candidate:

Date:

Signature: