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Disconnections in Legal Tech Design: An Infrastructural Problem?

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Abstract

This article explores the design of a new IT system within the Finnish court system, adopting a biographical approach as its inspiration. Thematically, it relates to debates on court digitalisation, involving complex technical, legal and social dimensions. The article's contribution is empirical and its theoretical framework draws from science and technology studies (STS) and infrastructure studies. By tracing the choices, technologies and participants involved in the AIPA Data Bank project, the article contributes to ongoing discussions about the role of digital transformation in legal contexts. I distinguish between the unintended consequences of technology use and the disconnections in the design that produce them. Disconnections in design occur in interactions and are related to the visions and goals of the project and the relationship between legacy systems and the new system. They manifest in legal practices such as courtroom sessions. The article suggests that IT systems design should be understood as an infrastructural issue, including the social aspects of legal work, to acknowledge the constitutive role of legal technology in human interaction.

Keywords: Digitalisation; court system; biographical approach; legal infrastructures.

1. Introduction

Designing technologies for the public judiciary can be difficult. While changing work practices in legal settings, technology challenges the regulatory environment, judicial structures, decision-making and legal language.[1] At the same time, law is often described as rigid and conservative – unlike fast-paced, innovative technology. Research literature on information system development within the judiciary is rife with examples of unsuccessful projects, suggesting a conflict of cultures between law and technology.[2] However, there is still a shortage of research on the digitalisation of public judicial systems[3] so more empirical, context-specific accounts on information systems developed for legal settings are needed. As the technological cannot be separated from the social, cultural and organizational,[4] it is paramount to scrutinise digitalisation and law in context. For this purpose, science and technology studies (STS) provide an interdisciplinary and empirically oriented research approach.

In what follows, I present a case study of a large-scale digitalisation project (AIPA Data Bank, 2007–2024) in the Finnish court system. The AIPA project is understood as providing historical context for building legal digital infrastructure in the public judiciary.[5] The project's aim was to rethink the work processes in general courts and to involve users in the design process to ensure legal expertise in the design. The AIPA system was also seen as the cornerstone of the future digital courtroom and justice system, with connections to other authorities' IT systems – mainly those of the police and other pre-trial investigation authorities. It can be understood as an attempt to build interconnected IT systems that operate together through the concept of the 'data pipe' covering the whole life-cycle of a legal document. I adopt a biographical approach and ask how design turned

[1] Kontiainen, "Oikeuden digitalisaatio"; Fenwick, "Lawyer of the Future"; Koivisto, "User Accounts."
[2] Reiling, "E-Justice Platforms"; Di Natale, "Digitising the Judicial Sector"; Contini, "Introduction."
[3] Di Natale, "Digitising the Judicial Sector."
[4] Bennani-Taylor, "Infrastructuring AI."
[5] See Bowker, "Toward Information Infrastructure Studies."

into technology use in the AIPA project. Given the nature of legal work (autonomy of the judges, discretion in decision-making) and the complex structures of the judiciary, the development of information systems often fails.[6] I argue that this is because IT systems are understood as tools, even though they are part of the legal infrastructure.

Theoretically, the article draws on science and technology studies (STS) and infrastructure studies, and is inspired by the method of biographical research.[7] In its attempt to account for multiple temporalities of technology and balancing representations of users and designers of technology, the approach emphasises 'technology in the making', the co-constitution of the phenomenon and context as well as following the same object during a longer period instead of 'snapshot studies'.[8] I diverge from approaches that see technology merely as a tool for streamlining digital public administration and instead understand it as forming, affecting and co-evolving with the digital legal infrastructure. To this end, I employ methods developed for following large-scale design projects over time.[9] Thus, technology is seen as an indeterminate and unstable artefact whose significance is negotiated, interpreted and sometimes closed.[10] Reflecting against the literature of infrastructures and breakdowns,[11] I suggest that the concept of *disconnection* offers a way forward in terms of analysing legal tech design as part of legal infrastructure.[12] This adds to STS-oriented debates on infrastructure, which have usually considered law as a background factor.

The findings suggest that, even when aimed at broader interoperable information systems, IT design easily collapses into tool development for various reasons, missing the opportunity to 'think infrastructurally' about the materialities and infrastructures of law.[13] Based on the findings, I argue that disconnections in the design phase will later manifest as unintended consequences in the use of the designed technology. As court IT systems are supposed to be interoperable with other public actors' systems, they form legal infrastructure. Treating IT projects only as tool development blurs their role in the infrastructures of law. The article is structured as follows. I begin by discussing technological development and design in judicial systems. I then present the concept of disconnections, reflecting it against the literature from infrastructure studies and IT systems design literature. After describing the research design, methodology and findings, the conclusion discusses a way forward for legal tech and digitalisation of judicial systems.

2. Technology Development in Judicial Systems

In its efforts to digitalise judicial procedures, technology is often understood as a tool to enhance the judicial system's activities. When considered only as a tool, technology is deprived of its constitutive role in human interactions.[14] Scholars have suggested that 'ICT constructs a new set of technologically mediated interdependences that regulate the way in which organizational procedures and processes are executed'.[15] Prior experience has shown that successful development of information systems requires both technological maturity and a legal foundation. However, it appears that the law tends to yield ground as technologies mature.[16] This adaptation can be seen as a dynamic interplay where law and technology influence each other as legal frameworks are likely to evolve over time.

Legal scholars have often focused on legal sources and technology regulation from a doctrinal perspective, and empirical studies have remained in the fringes of legal scholarship.[17]. However, scholars interested in law and technology have started to pay attention to the broader interconnections between law, technology and societal change. Especially in the context of automated decision-making and artificial intelligence (AI) regulation, legal scholars have called for more interdisciplinary and empirical studies.[18] Recently, the critical program of law and technology has focused on the co-constitutive relations between the legal and the socio-technical, as well as on methodologies that combine studies of regulation and data infrastructures.[19] Following this critique, rather than perceiving a legal 'gap' to be filled with 'new digital rights', we should be more interested in how law

[6] Reiling, "Technology for Justice."
[7] Hyysalo, "Method Matters."
[8] Wiegel, "Beyond the Single-site Study."
[9] Hyysalo, "Method Matters."
[10] Grint, "The Machine at Work,"
[11] Barry, "The Material Politics."
[12] Byrne, "Legal Infrastructures."
[13] Kingsbury, "Infrastructure and InfraReg."
[14] Rabardel, "People and Technology."
[15] Contini, "Law and Technology," 3.
[16] Koch, "Aligning ICT."
[17] Sankari, "Digitaalinen oikeus tutkimuksen kohteena."
[18] See Koulu, "Law and Digitalisation"; Koivisto, "Miten hyvä hallinto digitalisoidaan?"
[19] Van Den Meerssche, "International Law and Technology"; Sullivan, "Law, Technology and Data-Driven Security."

is already embedded within existing infrastructures[20]. Similarly, the theoretical and methodological needs within STS have revealed a 'blind spot': 'the failure to give consideration to such issues of how research results may be as much affected by the study framing as by theoretical point of departure'.[21] Moreover, design issues have increasingly been reconceptualised by incorporating interdisciplinary perspectives into legal scholarship.[22] Nevertheless, as a context for technology use, the courts have largely remained under-studied empirically.

From an organisational perspective, information technology is not a stand-alone tool but rather an environment that requires predetermined and standardised processes. This has pushed courts and judiciaries to re-examine the governance of their justice system.[23] At the European level, the design of e-justice services is seen as a question of interoperability and system adaptability, but so far the design, development and implementation of IT projects have suffered from fragmentation. Instead of embedding technologies into the structure and organisation in which they were supposed to operate, technology development projects have remained isolated efforts.[24] This suggests that, in the legal context, IT is seen as a tool. I propose looking at the co-constitutive relationship between law and technology.

While many judiciaries have benefited from the 'traditional' digital technologies such as case-management systems and the digital exchange of data, the era of AI promises more.[25] At the same time, technology challenges the institutional settings, making 'value-sensitive' design of legal algorithmic and automated systems a key issue. Scholars have moved towards searching for living interactions between law and technology.[26] IT environments also discipline and force users (prosecutors, lawyers, clerks and judges) to adapt and perform tasks according to digital processes calling for new skills. Prior research on IT development in the judiciary points to mismatches in technology development projects, as well as errors that go unnoticed even in simple inscriptions.[27]

According to Reiling and Contini,[28] law and technology interact through procedural standardisation (uniformity), workflow re-engineering and user involvement. Implementing technology is risky and depends on the type of court, the type of matter and the willingness of those involved; it is often affected by over-ambitious visions.[29] Reiling[30] suggests three models for handling the information processes in court IT solutions. First, relatively simple, and short processes can be replaced by digital processes in their entirety. The second alternative is reforming existing processes, such as large criminal cases. These need more redesigning and probably require changes in the legal basis. The third, and most successful, model is to design a new process altogether. The case I present here falls into this category.

All the models mentioned tend to be difficult to execute and require an understanding of how the legal procedures and processes work.[31] Liberation from routines comes with a price as it is not clear how well one can design the systems in advance to accommodate both the concerns of the law and those of technology. This means that the weaknesses of any organisation become visible when developing IT environments, a particularly pervasive difficulty in court settings that exhibit a high level of complexity.[32]

To mitigate the risks associated with development, user engagement has become paramount. The concept of a user is central to the case as the project aimed to involve end-users in the design process.[33] Research suggests that technological design and users' contributions to technology have often gone unnoticed,[34] and there has been a tendency to bypass the nuanced practices affecting the design and deployment of technology.[35] Scholars have argued that it makes more sense to talk about user

[20] Van Den Meerssche, "International Law and Technology."
[21] Hyysalo, "Method Matters," 4.
[22] Koulu, "In Search of Living Law."
[23] McAfee, "Mastering the Three Worlds"; Reiling, "E-Justice Platforms"; Reiling, "Digital Justice."
[24] Lanzara, "The Circulation of Agency"; Oskamp, "IT Support of the Judiciary."
[25] Contini, "Artificial Intelligence."
[26] Koulu, "In Search of Living Law"; Koulu, "Crafting Digital Transparency."
[27] Contini, "The Elusive Mediation"; Reiling, "Digital Justice."
[28] Reiling, "E-Justice Platforms."
[29] Allsop, "Technology and the Future."
[30] Reiling, "Digital Justice."
[31] Reiling, "Digital Justice."
[32] Reiling, "Digital Justice"; Di Natale, "Digitising the Judicial Sector."
[33] See Lanzara and Patriotta, "Technology and the courtroom".
[34] Hyysalo, "Series of Configurational Movements."
[35] Glaser, "The Biography of an Algorithm"; Pollock, "E-infrastructures."

contributions and series of configurational moments and movements when shaping technology.[36] The question is not only who decides, translates and designs technological systems, but also concerns when technology is used and reiterated over time. Therefore, 'the user is not a transcendental being who dictates how artefacts are used, but a historical construction, in the sense of embodying the longstanding lessons of experience that may often transcend the life span of individuals'.[37]

In law, professionals often retain their power through materialities, procedural practices and autonomy. Yet, scholars are concerned about witnessing a phenomenon in which formal rules are transformed into code, digital interfaces and back-end operations that automate and guide human actions.[38] New IT systems cement and endorse practices, which then have outcomes affecting legal personnel as well as those who are subject to the law. This challenges the role of one of the most significant elements: the human actor. Legal decision-making traditionally relies on the human decision-maker, and keeping the 'human in the loop' is envisioned as a safeguard. In the judicial system, this has meant broad discretionary power for the judge to make decisions.[39] The digitalisation of judicial work, in turn, calls for broad legal concepts to become articulated and standardised – which, as Contini and Reiling[40] argue, is the weak link of technological development because human discretionary power and independence are now curtailed and partly moved into the hands of software developers.

3. IT Design as a Legal Infrastructural Problem

One way to conceptualise court digitalisation projects is to consider them as creating infrastructure in a similar way to courthouse buildings or cables. Such framing could also explain why such systems seem to be perceived as neutral and inconsequential in both the literature and empirical data.[41] IT systems in court organisations are typically viewed merely as tools, especially in the design phase. However, these systems mediate legal knowledge and practice shaping judicial relations and imaginaries.[42] Infrastructures draw together both social and technical elements, and as a process, designing large-scale IT system networks fits into this category.

To enhance understanding of information system design and its constitutive role in creating digital legal infrastructure, I apply the concept of *disconnection* as an analytical lens to the case. This approach is informed by ongoing scholarly debate about unintentional consequences and infrastructure breakdowns in infrastructure studies, as well as perspectives on sociotechnical systems provided by STS scholars.[43] Some conceptual clarification is needed: a disconnection is something that makes certain design choices invisible, and they later materialise as unintended consequences (and possibly breakdowns). Breakdowns, in turn, make infrastructure visible and can include material components breaking down, resources diminishing and so on.[44] The key difference is that unintended consequences and breakdowns are an integral part of technology use,[45] whereas disconnections are part of the design process. When designing an IT system as a tool, it hides the infrastructural aspects of technology use in the judiciary.

Infrastructure studies have discussed the maintenance and repair of infrastructures, focusing on their spatiality, temporality, (in)visibility and materiality.[46] Similarly, literature on design gaps exists on assumptions and user expectations but not so much in the context of law.[47] Information or digital infrastructures, which consist of interconnected systems, are thought of as open-ended, heterogeneous and stretching across space and time; they differ from information systems, which have distinct functionalities and boundaries.[48] However, information systems contribute to the creation of infrastructure, although they are not equally open and generative. They are often part of a wider network, and their interfaces enable interaction between organizations. In addition, it can be argued that they form a part of the legal infrastructure, a topic often missing in infrastructure studies and legal studies. Legal scholarship often focuses on data infrastructures as objects of regulation, whereas in STS-

[36] Hyysalo, "Method Matters"; Glaser, "The Biography of an Algorithm"; Hyysalo, "Series of Configurational Movements."

[37] Kallinikos," Regulative Regime of Technology," 69.
[38] Contini," Double Normalization."
[39] Koulu," Proceduralizing Control and Discretion."
[40] Contini, "Double Normalization."
[41] Heikkonen, "Transparency Materialized."
[42] Kingsbury, "Infrastructure and InfraReg."
[43] Pinch, "Social Construction of Facts"; Edwards, "Infrastructure and Modernity"; Eriksen, "Afterword: Some Unintentional Consequences."
[44] Star, "Steps Toward an Ecology"; Steinhardt, "Breaking Down."
[45] Rosner, "Designing for Repair?"
[46] Jackson, "Rethinking Repair"; Bowker, "Sorting Things Out"; Barry, "Material Politics of Infrastructure"; Edwards, "Understanding Infrastructure"; Star, "The Ethnography of Infrastructure."
[47] Jackson," Understanding Infrastructure."
[48] Jarrahi, "Digital Assemblages, Information Infrastructures."

related infrastructure studies, law is considered a background factor.[49] Thinking infrastructurally, as Kingsbury notes, means understanding infrastructure as a set of relations, processes and imaginations.[50]

Digital infrastructure research considers digital infrastructures as a specific type of IT artefact,[51] but so far research has not focused much on IT's role within legal infrastructures. By extending the historical timeline of observations, the infrastructural aspects of IT development can be detected. For instance, earlier literature[52] documents the developments of the Finnish case-management system in the 1990s; in our case study, this is among those AIPA is set to replace. Studying the AIPA system is justified as it supersedes earlier systems once considered successful. Consequently, it is intertwined with the historical trajectory of court IT infrastructure. Recently, law itself has been considered a form of infrastructure with the legal comprised of interconnected legal norms, practices, and institutions.[53] This perspective highlights law's materiality and distributional aspects. Therefore, the question is more about how legal norms and practices move through physical/digital infrastructures, forming a co-constitutive relationship.[54]

Previous research on technological development in the judiciary suggests various types of shortcomings. For example, there appears to be a domain-specific legal knowledge that is difficult to 'extract' because it can be tacit from expert's perspective. Unsuccessful IT projects also fail for strategic reasons: organisations lack the ability to position themselves and plan IT in alignment with their overall purpose and role.[55] In the public judiciary, the organisational perspective is sometimes overshadowed by the strong focus on the legal autonomy and discretion of the judges, as well as efficiency expectations, driven by managerial goals. Additionally, the literature has focused on intended and *unintended consequences* of technology use, highlighting the need for a situated and processual approach, given the difficulty in predicting technology adoption within organisations.[56] Regarding design, unintended consequences can be something of which designers are unaware or that they choose to ignore – that is, they are consequences of organised rather than independent action.[57]

The initial mismatch between law and technology design, as suggested by Reiling,[58] is that IT system design should look to the future whereas the law usually works by judging past events. Second, in large judiciary IT projects, the context involves several actors, leading to complexity at the political, organisational and collaborative levels. Many IT projects have introduced software developers as the true determinants of procedural law as they encode and implement the information systems, although legal experts would have been involved in design.[59] This form of translation of legal expertise into code, no matter how accurate the translation is, shifts discretionary power away from legal professionals. In addition, the question remains: Do we consider legal experts to be disposable once we have extracted, standardised and automated their expertise?[60] Research suggests that this, to some extent, is the case.[61]

Why look at disconnections in design in the legal context? I propose that disconnections in design are related to interactions, which are connected to living legal practices.[62] Practices are manifestations of infrastructures, as technical systems enable certain actions while hindering others.[63] This perspective enhances understanding of courts as organisations – which, despite operating under similar premises, are rather dissimilar in terms of interaction. Courts form a hierarchical and interconnected system. In the case at hand, the existing and future legal infrastructure is connected to organizational aspects of each district court, adding to the complexity. However, court IT systems and their design offer an opportunity to view these design processes as efforts to create a digital legal infrastructure. The biographical approach, in turn, allows us to study these processes empirically and in context.

[49] Byrne, "Legal Infrastructures." On data infrastructures and law, see Fisher, "Confronting Data Inequality."
[50] Kingsbury, "Infrastructure and InfraReg."
[51] Tilson, "Digital Infrastructures."
[52] Henfridsson, "Generative Mechanisms"; Fabri, "E-justice in Finland."
[53] Byrne, "Legal Infrastructures," 10.
[54] Byrne, "Legal Infrastructures."
[55] Reiling, "Technology for Justice."
[56] Monteiro, "Qualitative Research Methods"; Orlikowski, "Shaping Electronic Communication."
[57] Walsh, "Towards a Theory."
[58] Reiling, "Technology for Justice."
[59] Contini," Double Normalization."
[60] Ribes," The Logic of Domains."
[61] Contini," Double Normalization."
[62] Koulu, "In Search of Living Law."
[63] Jalas, "The Rhythms of Infrastructure."

4. Research Design

In spring 2023, the research group collected documentary data and held two preliminary meetings with the key informant from the AIPA project office. The group also had access to the documentary material related to the decisions behind the project, as well as the design and implementation phases of AIPA. These included the Enterprise Architecture description, the purchase documents and feedback material gathered on the usability, user experience and effectiveness of the system. In the latter part of 2023, thematic interviews (N = 13) were conducted with individuals engaged in various phases of the project, including members of the advisory board, technology consultancy and project office management, as well as end-users of the AIPA system. Five interviewees were decision-makers, while the remaining eight end-users (judges, secretaries) represented six different district courts. Some of the end-users had held a specific role as contact persons or office trainers for the AIPA system, giving them longer experience with the system and enabling them to reflect extensively on its development.

My analysis was inspired by the biographical approach, drawing from biography of artefacts and practices (BOAP).[64] It pays attention to the historical trajectory of the case and data collection from various sources contributing to understanding the AIPA project's long-term evolution dynamics. In this way, it offers an alternative to more quantitative and pseudo-objective approaches. The biographical approach has its roots in research projects among STS scholars in Edinburgh and Helsinki in the mid- to late 1990s.[65] The approach draws from a pluralist theoretical foundation being compatible with various theories in STS, such as social shaping of technology, symbolic interactionism, situational analysis, the social construction of technology and some aspects of actor-network theory (ANT).[66]

My analysis followed the framework suggested by Hyysalo et al.,[67] focusing on a multi-site case study of six independent district courts. Although AIPA is designed for general court use, it integrates with various actors, both within and outside the court system. The study draws on diverse data from multiple sources – for example, the project office and the Legal Register Centre, which is responsible for archiving project documentation. The biographical approach allowed me to follow the key locales, people and interstices to gain a more detailed picture of the development and use of AIPA. The analysis includes tracing the choices, technology and actors involved in the AIPA project. In the analysis, recursively moving between the datasets and sampling strategies was paramount.

My first analytical step was constructing the general timeline of the AIPA project to understand the project's configurational movements, phases and context. The fact that AIPA's development took over ten years means that many technologies reached the end of their lifespan during that time. This is why the biographical approach is helpful: it goes beyond focusing solely on technology and provides conceptual clarity on the complex ways in which the aims, expectations and uses of technology change. Figure 1 illustrates three tiers, which loosely follow the levels of infrastructure suggested by Edwards.[68] First, the political decision-making and structural changes in the judicial system create the societal context in which AIPA was embedded. Second, the project office made decisions on the technical development of the system, which required collaboration beyond the court system boundaries, involving interaction between the technology developers, end-users and decision-makers. Third, the implementation of AIPA took place through several phases and pilots, which meant cyclical interactions between the project office and the users in general courts. Once the timeline was ready, it was presented to the key informant, who then commented on its accuracy.

[64] Monteiro, "Qualitative Research Methods"; Glaser, "The Biography of an Algorithm"; Hyysalo, "Method Matters"; see also Von Hippel, "The Sources of Innovation."
[65] Hyysalo" Method Matters"; Silvast and Virtanen, "On Theory-Methods Packages."
[66] Silvast and Virtanen, "On Theory-Methods Packages."
[67] Hyysalo, "Method Matters."
[68] Edwards, "Infrastructure and Modernity."

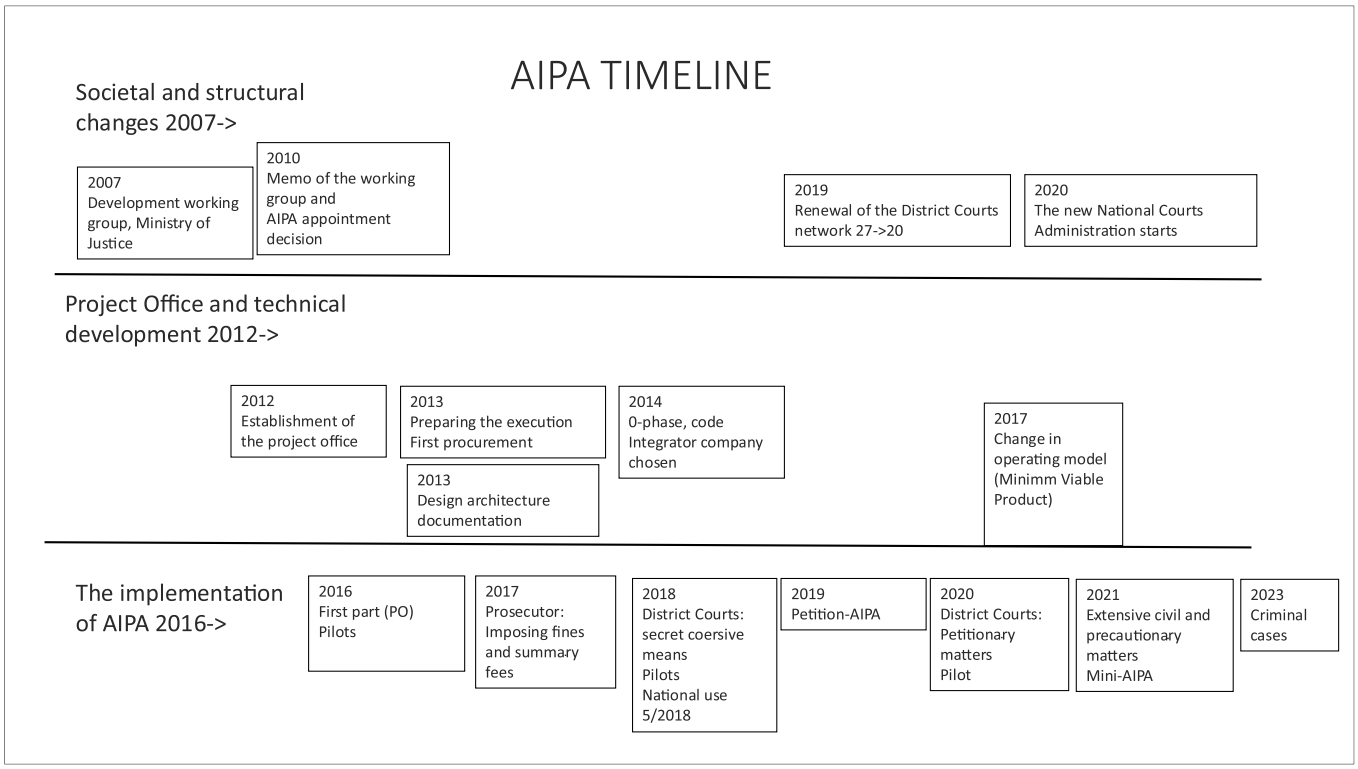

Figure 1. AIPA timeline, 2007–2024

In the case of AIPA, the legacy systems are quite well documented and researched.[69] The most notable systems that AIPA is set to replace are Tuomas, Sakari and RITU. By the time the AIPA project started, several of these legacy systems were working independently and becoming technologically outdated, prompting the need to design new systems. In addition, AIPA was envisioned to operate with the information systems developed simultaneously by the Police (VITJA system) and the Prison and Probation Services of Finland (Roti system). However, the VITJA project was terminated before it had been implemented.

The second part of the analysis was based on the document data and interviews, which were analysed with the help of qualitative content analysis,[70] focusing on the project's goals, conflicts expressed by the informants and unintentional outcomes of the project.[71] In analysing the interviews, I coded expressions that highlighted gaps in knowledge and shortcomings in the technological choices. I then identified the following disconnections: (1) those concerning technological knowledge and legal knowledge; (2) those concerning the technological shortcomings between the legacy systems and the new system; and (3) those involving unintended consequences, which materialised in work practices when AIPA was piloted and implemented.

I used the document data (procurement documents, indicators monitoring the project's progress, usability surveys, evaluation report, etc.) as representations of the formal progress of AIPA. In the following sections, I present the context and case of the AIPA project before discussing the disconnections in more detail.

5. Context: The AIPA Project

The AIPA project (2012–2024) is the most recent effort to digitalise the Finnish general courts, which operate in a network with several other actors, such as the police and probation services. Initially, the project was established to create an information system entity and to improve and harmonise case and document-management processes nationwide, enabling cross-administrative electronic cooperation with the systems of other actors in the judiciary.[72] The reform aimed to upgrade the outdated technology, which was mostly developed for the purposes of each court level without much consideration for

[69] Fabri, "E-Justice in Finland."
[70] Harwood, "An Overview."
[71] see also Ikuesan, "Digitalising Justice."
[72] Asettamispäätös 15/31/2010.

electronic data transfer between them.[73] At the same time, the processing times of cases were considered too long, system errors caused problems in enforcement of judicial decisions, and efficiency was sought, guided by the ideal of a paperless court.

Currently, the AIPA system provides a joint system for processing of summary fines, secret coercive measures, petitions (e.g. divorce, child custody) and large-scale litigation. It includes a data bank, a digital archive system and a data pool for reporting statistics related to the general courts and prosecutor's office. The information system aims to support judges in their work improving the quality and transmission of legal information. Additionally, by minimising (mostly secretarial) routine work, the duration of court proceedings should be reduced. All the changes were envisioned to bring more flexibility to work practices.[74] Both the Ministry of Justice and the AIPA project office stressed that engaging the users in the design would help to avoid earlier negative experiences in IT development.[75] AIPA was envisioned to play a significant role in the structural reorganisation of the Finnish courts system, where creating administratively larger units would allow for more efficient workload and resource allocation.[76] This aim shows an effort to create a techno-legal infrastructure based on the use of technological solutions.

6. Disconnections Concerning Knowledge

The first disconnection was about knowledge gaps between the tech developers and legal experts. The project office played a significant role in prioritising the project's goals and making crucial decisions about design. For example, the information system's usability was a primary focus, aligning with the objectives of the Ministry of Justice to involve end-users in the design process. This decision reflects prior experiences of unsuccessful and overly technology-driven IT projects. Early on, a decision was made that people working in the judicial system would be the product owners, as this would ensure the domain-specific knowledge needed to build an IT system. Therefore, many participants had a legal background rather than technological expertise. Consequently, the project office brought together actors with diverse roles in the judicial system to incorporate the voice of end-users in the design of the system's architecture.

Initially, several working groups planned the functionalities and enterprise architecture for the AIPA system. These working groups focused on communications, human resource issues and stakeholder collaboration. To support the change-management efforts, an agency manager network of 250 people was established to strengthen the implementation of the AIPA system. It consisted of two people from each court level trained to become AIPA contact persons and 'AIPA trainers' in district courts and courts of appeal. An outside usability expert worked as a leader of the user interface working group to ensure the viewpoints of the end-users were considered.

From the start, the project office was described as having a good atmosphere and enthusiasm. However, the interviewees mentioned a knowledge gap between the legal experts and technology developers:

> In a way, these two worlds, our knowledge of what the law is, and the consultants' knowledge of how things can be done technically, did not meet much at that point. (H6 Judge)

In addition, the project was described as unrealistic in its initial goal-setting. The target state descriptions included trivial and self-evident things alongside more 'sci-fi' views about what digitalisation is and what can be automated, without a concrete understanding of what would be needed to achieve those visions. A member of the advisory board pointed out that the ways of thinking 'legally' diverged significantly from a developer mindset:

> I somehow got the feeling that there was quite a lot of crosstalk, or side-talk. The suppliers and the architects were talking about this AIPA and meant something by it. And then again, this "courtroom crowd" was talking about AIPA, and meant something completely different. Those words or phrases did not match. (H5 Advisory board).

The same informant described how the seemingly straightforward legal process unexpectedly has special circumstances and details, affecting the working groups' meetings:

> I have the impression that when there was a workshop aiming to describe the legal process, the lawyers came in and talked for three hours about the deviation of a deviation. And then they went away, and the actual process was not described. It kind of happened that the workshops did not produce it [the envisioned outcome]. Or it would have taken an awful lot of workshops to go through the deviations. This is probably also the lawyer's mindset.

[73] OM, "Yleisten tuomioistuinten asianhallinnan kehittäminen."
[74] OM, "Oikeudenhoidon uudistamisohjelma," 18.
[75] "RITU Usability Survey."
[76] OM," Käräjäoikeusverkoston kehittäminen," 29.

This quote crystallises how legal knowledge is amalgamated with knowledge on legal processes and exceptions within them. It also highlights why the standardisation of legal processes is challenging. Other informants mentioned that sometimes knowledge was so obvious to the legal experts that they failed to mention it, and technical experts did not know how to ask about it.

The situation was further complicated by the fact that the IT providers lacked knowledge, experience or understanding of the legal context. However, as one informant stated, the AIPA project had been planned for six years before the procurement, and the subscriber knew what they wanted. Moreover, as there are not many IT companies specialised in law in Finland, the tech provider lacked understanding that the system subscriber thought was important. Sharing tacit knowledge would have taken more time than the project start allowed, although understanding how law 'works' would have made the tech developers more aware of the context in which the technology was to be used. From the project's perspective, increasing the number of workshops would also have meant more money spent. Despite the initial shortcomings, the first versions of the AIPA system were implemented with good results.

When characterizing their involvement with the project, the informants described it as learning a new language or culture. For example, product owners had not fully realised their responsibility for making technological decisions:

> What was surprising was that my role was not, as I had perhaps imagined or hoped, that I would be able to maintain my role as a judge. It was a surprise to me, and I think to everyone else who came into the role of product owners, how far we had to go ourselves to think about what exactly those [IT] functions are in practice, not just the desired outcome. (H6 Judge)

The quote implies that the legal experts had envisioned their role to be simpler and that the technological domain was perceived as difficult. Thus, gaps in knowledge and dialogue on both technology suppliers' and legal experts' side hindered the planning and design phase.

7. Disconnections Concerning Technology: The Weight of the Legacy Systems

The second disconnection happened when the informants compared the new AIPA system with the old ones. This type of comparison is understandable because the legacy systems were in use while the AIPA system was developed. Although it was clear that the new system would replace the old ones and require new practices within organisations, informants still referred to the current systems when describing their expectations of the new system:

> I personally had thought that AIPA should at least be able to do what our Tuomas-Sakari-Notes system and RITU can do. This is based on the fact that there must have been requirement specifications for those systems as well, and they have been relatively easy to use as a basis. I have fundamentally thought that the level our system currently provides is sufficient [for AIPA as well]. (H8 Judge)

The expectation that old specifications would be used when designing the new system remained in the minds of the users, although the starting point of the AIPA project was to design a completely new IT system. The disconnection was both practical and material: whatever was imagined – a new IT system – was connected to the practical side of work in the district courts. The weight of the legacy systems was not the same for everyone, though. Depending on the organisation, some systems that were in use in district courts were not in use elsewhere. There was, for example, some speculation that the prosecutors might object to using AIPA because they did not have the RITU system in use, so they had not experienced the problems related to its use. The difference between the old systems and AIPA was also explained by the differences in the logic of the old systems. Now all work was supposed to move *inside* AIPA in contrast to the old systems, which were perceived to operate *outside* of the context of judges' work – for instance, in courtroom sessions.

Comparing the new system with the old ones is a concrete example of how the existing systems are integral to the material working environment, making the legal practice visible. The disconnection was crucial because, in the AIPA documentation and goals, it was envisioned to be part of the district court work practice reform, not solely a new IT system design. Thus, the disconnection illustrates how, to some informants, AIPA brought new problems compared with the existing systems:

> So, all those specific functions, for example, that currently go directly through RITU, will need to be sent to the prosecutor using some workaround. They don't go directly from AIPA. One example is that if a respondent or any party in a case expresses dissatisfaction, we used to record this dissatisfaction in RITU, and it was approved there. At the same time, there was an option to send a notification to the prosecutor that a dissatisfaction notice had been received. Now, that option is not available. So, we need to come up with a clever way to ensure that this information also reaches the prosecutor. (H9 secretary)

Working around the technological solutions takes time, which was already perceived as a scarce resource. The disconnections caused frustration and led to unintended consequences, which I will describe next.

8. Materialised Disconnections

The third disconnection happened because, over time, the project office was perceived as losing touch with practical work in the courts. Delays are common in large-scale projects,[77] but from the viewpoint of end-users the disconnection meant unintended consequences as they felt technical engineering knowledge had begun to override practical legal needs:

> It was good at the beginning when they started the AIPA project, that they took these product owners out of the field. The original idea was to get practical insight [to the project], but now the problem is perhaps that when AIPA project has been running for ten years, these people who originally transitioned from the field to the project no longer understand what the practical need is. That substantive expertise inevitably declines when you are only there on the technical side. (H2 Judge)

As mentioned above, end-users equated the project office with 'the technical side', highlighting a disconnect between the practice of law and technical development. From an infrastructural perspective, legal practices essential for the public judiciary's function have become detached from the design. This perceived disconnection was particularly problematic due to delays in implementing the final parts of AIPA, the criminal cases. Criminal cases can be complex and the current version of Criminal Case AIPA was perceived as insufficient and disconnected from the daily work of judges:

> The incompleteness of the criminal case AIPA is somewhat shocking to me. When I think about the document element and the solutions that have been implemented. How our document management is handled, it is inadequate and weak. It seems to me that the system should have been developed more in line with the law user's needs and their session work, rather than focusing on the system requirements, data protection, data security and system development. That has undoubtedly been the biggest challenge of the AIPA journey for me all along. Even though judges have been involved in defining and creating it, the system is such a vast entity that perhaps the end user's genuine, real way of working is not sufficiently visible. (H10 Judge)

Legal experts, who were supposed to bring the 'field's knowledge' to the design process, had become disconnected from that practice as they had been working for the project organisation. The discomfort related to the implementation of the last part of AIPA presents a configurational moment in the making, as the pilots were only starting at the time of the interviews. Despite the users' critical tones towards the Criminal Case AIPA, they thought that other case types, such as summary fines, coercive measures and petitionary matters, worked well. These processes may be easier to standardise than large criminal cases for several reasons, such as the low number of documents (forms, evidence) needed and the reduced level of discretion involved. There was a particularly critical disconnection between the AIPA system development and the work practices of judges: the system did not work well in courtroom sessions, which were understood as the core of the judges' legal expertise. Next, to exemplify the materialisation of these disconnections as unintended consequences, I will zoom in on the session work of the judges.

8.1 Courtroom Interaction: A Critical Environment for Using Technology

In a court session, situations can change swiftly, and there is no time to pause, for example, if the prosecutor changes the charge or when a party speaks very quickly, as explained by the informants. Many judges described that, in such cases, it is easier to use pen and paper to take notes. The disconnection between the project office and the district courts was perceived as a disconnection of practice and current knowledge of the 'field', but it *manifested* in the interactions during courtroom sessions as technological dysfunction hindering the practice of judging.

The following quote highlights how opening large documents and cases in AIPA can delay the session:

> I tested it in one larger case. It took 15 minutes to open the documents in AIPA. That kind of delay cannot happen when the session starts. So, we save everything on the desktop. In practice, we don't use AIPA in session because of its slowness. If you start to open a document which you need, that element is difficult to use. (H2 Judge)

This quote is at odds with the narratives of fast-paced technology. It reveals the swift, but hidden, workings of law as practice: while law may be considered slow and technology fast,[78] we might not have looked deeply enough into the practices. Many informants found AIPA still too unreliable and slow to use in a fast-paced courtroom session. This can be interpreted as a

[77] Reiling, "Technology for Justice."
[78] Arvidsson and Noll, "Decision Making in Asylum."

moment in which living legal practice[79] collides with the (immature) technological solution. The quote also describes why AIPA users resort to alternative work practices when they want the court session to proceed swiftly. In fact, many described how they organised the documents with the help of the network drive to create a working copy of the case. The slowness of document management in AIPA was perceived as a real challenge:

> Yes, in practice, quite a big challenge or disappointment is how to work with the system of judging. It is a lot of sitting in that courtroom, and the document element functionalities for that work are poor. The documents open very slowly, and you can't make notes in them, even with a PDF editor in the courtroom, which would be very important for the judge to be able to get the evidence out and then save his own notes. So, in a way, it is perhaps the kind of thing where I would have hoped that it would work better in the judging process. (H10 Judge)

Both quotes highlight the particularity of courtroom work and the practice of being present for the people in the courtroom. Information systems should not interfere with interactions between people in the courtroom. If that happens, it creates a crucial breakdown between humans produced by technology. When technology does not work well, people tend to create 'shortcuts' or alternative ways of circumventing technology. Using or not using AIPA in the courtroom manifests a disconnection referred to earlier: the initial aim of the AIPA system was for it to form a part of the digital courtroom. However, as explained by the informants, the work in a courtroom session is detached from the AIPA and only after the session is it used 'outside' of the courtroom.

9. After AIPA

In 2024, the National Audit Office of Finland evaluated the three IT development projects: AIPA, VITJA and Roti. The evaluation was critical, primarily as all the projects had significantly exceeded their budgets and schedules, and the VITJA project had been terminated before the IT system could be implemented. I reflect on some of the evaluation report's outcomes against the case study. First, the evaluation highlights several similar issues concerning the AIPA project that I have identified in this case study, such as the unrealistic and unclear expectations at the project's outset and the shortcomings (or disconnections) in user involvement as the project experienced delays. However, the evaluation report suggests that the problem was a lack of IT expertise within the project. This is to an extent contradictory to the interviews, which depicted a situation where the IT providers lacked sufficient understanding of the legal context.

Second, the evaluation report lists critical points for IT projects.[80] For example, the report states that the end-users must be involved in the project through techniques of change management and by correctly timed user training, which it admits are problematic issues in the three evaluated projects. The report also advises against giving overly optimistic views of the system to the end-users. In the AIPA case study, the informants had expected the new system to perform at least as well as the old ones. Comparing the legacy systems to the new one was a practical issue in a situation where the new system was not working and remained unfinished.

Third, the report stated that the three IT projects had exclusionary effects when it came to other IT projects, meaning that the evaluated projects had blocked other IT initiatives. Overall, the outlook of the evaluation report is realistic in acknowledging that the interoperability of the three systems was not achieved, meaning that information will not move freely between the systems any time soon.

10. Conclusion

I have examined a digitalisation project from the perspective of disconnections. Inspired by the biographical approach and the vocabulary provided by infrastructure studies in STS, I argue that disconnections exemplify and manifest the problems encountered in legal tech design and are connected to what ultimately will construe the legal (digital) infrastructure.[81] Based on existing literature and the analysis, I have identified several types of disconnections as well as their interconnectedness. From the perspective of the biographical approach, these types of disconnections may provide insight into the configurational moments and movements identified by prior literature, which has emphasised the coming together of diverse user communities.[82] As demonstrated through several disconnections, the realities of district courts and legal practices became invisible, including judges' and legal secretaries' everyday work. These disconnections, however, contribute to current and

[79] Koulu, "In Search of Living Law."
[80] VTV, "Vanhat Tietojärjestelmät," 6.
[81] see Byrne, "Legal Infrastructures."
[82] Hyysalo," Method Matters"; Glaser, "The Biography of an Algorithm."

upcoming legal practices affecting the way law is enacted. Whereas breakdowns make technological infrastructure visible,[83] disconnections do the same in the design contexts, first by hiding the traces of design and then by manifesting them as unintended consequences and breakdowns in the actual legal work. These will mostly be addressed as governance issues within public administration.

The disconnections in this study relate to project organisation and knowledge acquisition, the technological comparisons between the existing and the new IT systems and the manifestation of these disconnections in practical legal settings, particularly courtroom sessions. While the AIPA system was envisioned as an infrastructure, in practice the project was perceived as tool development, with the new system being compared with previous and existing systems and practices in courtrooms. However, in the legal context, IT is only one element intertwined with legal practices, influenced by various factors and situations. The case provides perspectives on the relationship between law and technology, such as how to realign the two existing infrastructures: the legal infrastructure and the technological infrastructure. In this realignment, the relationship between legal knowledge and technical knowledge in IT design is complex and co-constitutive,[84] while legal knowledge is often situated and tacit. A gap between tech suppliers' and legal professionals' understanding of each other's domains influences the design of the system. However, in the case of AIPA, the knowledge and use of the existing IT systems made it difficult to imagine a completely new system. I suggest that because, in practice, the projects are reduced to tool development instead of creating techno-legal infrastructure, legal knowledge and user experience fade into the background after the initial design phase.

Regarding users, the study raises several questions. The case demonstrated that, over time, professionals in the field perceived the project office as too technology oriented. This highlights the challenge of accurately identifying the 'end-user' while respecting the diversity and independence of work practices, without separating expertise from actual field practices during design processes. One possibility is to promote knowledge exchange earlier in the procurement phase and facilitate bridging the domains of law and information technology. Another issue concerns the ideals of expertise; as the case shows, the disconnection from the users still occurred when legal experts working for the project office lost touch with legal practice.

For further studies, I suggest examining legal professionals and the domain of law from the perspective of expertise needed to carry out massive projects engaging the 'end-users'. This perspective opens the difficult, yet previously unaddressed issue of who the IT systems are created for. I fear that by focusing solely on technical design from the perspective of tech developers and civil servants' collaboration, the citizens are excluded, even though they are, in a broad sense, the end-users of these systems. Given that these systems, as stated in AIPA goals, are supposed to improve the public judiciary and its services, the exclusion of the citizen perspective is troubling. Neglecting the public aspect of legal work is magnified when one adopts an infrastructural approach.

To summarise, I argue that because IT systems are understood primarily through their instrumental value as tools, legal scholarship has failed to acknowledge them as significant components of legal infrastructure. For the infrastructure debate that is now emerging within legal scholarship,[85] the insights from science and technology studies (STS) are valuable. The fact that the AIPA system operates within a network of other public authorities, and was supposed to be compatible with the IT system of the police, suggests that an infrastructural approach is relevant in the context of law use and the general court system. Additionally, as scholars have already pointed out,[86] we should be interested in the methodologies and theorisations regarding research of legal contexts as sites for work organization and technology design, which have a profound impact on law and citizens. While the present case study may not qualify as a full-scale biographical study, it is a step towards it. In the future, more ethnographically oriented biographical studies are needed to experiment with the concept of disconnection in diverse contexts.

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[83] Star, "The Ethnography of Infrastructure."
[84] Lanzara, "Technology and the Courtroom"; Kingsbury, "Infrastructure and InfraReg."
[85] See Byrne, "Legal Infrastructures"; Byrne, "Editors' Introduction."
[86] See Pollock, "E-infrastructures."

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