



SCHOOL OF COMPUTATION,
INFORMATION AND TECHNOLOGY —
INFORMATICS

TECHNISCHE UNIVERSITÄT MÜNCHEN

Bachelor's Thesis in Information Systems

**Exploring the Gap between the Academic
and Practical Perspective of Legal Tech**

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TUM School of Computation,
Information and Technology



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Die Diskrepanz zwischen akademischer und praktischer Perspektive von Legal Tech

Exploring the Gap between the Academic and Practical Perspective of Legal Tech

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I confirm that this bachelor's thesis is my own work and I have documented all sources and material used.

Munich, 15.12.2023

Paul Poppe

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Abstract

In the contemporary landscape of legal tech research, a predominant focus is placed on cutting-edge technologies such as natural language processing (NLP), machine learning (ML), and artificial intelligence (AI). However, the practical implementation and perspective of legal tech appear to lag behind these technological advancements. This research project explores this gap by conducting interviews with professionals engaged in the legal industry, as well as academic researchers specializing in legal tech.

We first explore various literature to seek an understanding of frameworks and models of technology adoption. We explain the technology acceptance model from Davis, the Unified Theory of Acceptance and Use of Technology, and dive into Roger's theory about the adoption lifecycle, process, and factors.

We used those theoretical frameworks to develop an interview guideline, prior to conducting semi-structured interviews with 16 legal practitioners as well as one academic legal tech researcher. The insights from those interviews comprise of practitioners' use and benefits of legal tech applications, as well as common challenges and barriers faced in the adoption process. We faced severe differences regarding the adoption amount and sophistication of applications, specifically between small, medium, and large firms, as well as between different occupations. While proper problem/target understanding and active work by a dedicated legal tech responsible team or person were identified as the main success factors, we must acknowledge existing barriers. We systematized challenges into user-related challenges, which focus on the law firm employee, e.g. their lack of process understanding, resistance, and skepticism, organizational challenges, like resource constraints and uncertainty in decision-making as a result of insufficient commitment to legal tech, industry-related challenges, e.g. bureaucratic hurdles and the legal situation, and operational and technical challenges, comprising of the lack of data, technical problems with applications and devices or the prominent cloud vs. on-premise debate.

This thesis explores above mentioned topics in more detail and presents an extensive overview, which can guide practitioners and researchers in future decision-making by using the information, patterns, and knowledge, collected in this project.

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1. Introduction

To commence this thesis, an examination of the motivation for our research is important. Section 1.2 explains how our work integrates within the current research landscape, then 1.3 provides an overview of the subsequent chapters.

1.1. Motivation

Current research in the legal tech domain revolves around advanced NLP, ML, and AI. In other industries, sophisticated AI tools have surfaced, sparking extensive discourse and adoption. However, a visible gap persists between theoretical advancements and practical implementations within the legal domain [Zho+20].

A prior investigation, conducted at the chair of SEBIS at the Technical University of Munich (TUM), shows a noticeable deficiency in practitioners' comprehension of the full potential of legal tech [Pre23]. Existing literature underscores the width of this divergence. Notably, Gartner reveals a reliance on manual workflows and outsourcing among large organizations, indicative of a reluctance to adopt legal tech applications that could significantly enhance efficiency. Gartner's findings indicate that a substantial 63% of in-house legal work falls into routine or standardizable categories. Regrettably, Legal Tech's potential to automate this work remains largely unused, highlighting the prevalent gap between theoretical potential and practical adoption in the legal industry [Lav19].

This thesis seeks to explore the gap, persistent between academic research in the legal tech domain, and, potential advanced use cases emerging and the actual usage of legal tech applications. We will furthermore explore the reasons, why this gap exists, including barriers and challenges practitioners face in the adoption process, and find solutions on how to overcome those problems by presenting success patterns. The results can be valuable for researchers to understand the actual needs and requirements of practitioners as well as for practitioners, to whom this thesis can be a guide in bringing their legal tech adoption to the next level by copying presented success stories. For law firms lacking information about a strategic overview of their legal tech adoption, this thesis can bring them a more cohesive overview of challenges, benefits, and technology adoption in the legal domain, and enable them to adopt a more informed approach in future decision-making.

1.2. Integration in the Research Project NLawP

The Natural Language Processing and Legal Tech (NLawP) project delves into the disruptive potential of AI within the legal sector, evaluating the impact of recent advancements of large language models (LLMs). NLawP aims to map the current state of legal tech, explore data governance for responsible adoption, and facilitate collaboration among stakeholders to generate ideas and innovations [VMW]. The primary objective of NLawP is to understand how AI language technologies, specifically NLP-driven technologies, can be harnessed to realize their potential while ensuring the mitigation of associated risks. Given the dynamic nature of AI technologies and the ongoing re-imagining of legal tech applications, the research incorporates aspects of innovation into its objectives. Recognizing that progress is contingent on robust infrastructures, especially concerning data, NLawP adopts an integrated perspective. This perspective addresses the interplay between infrastructure, potential innovations, technology adoption, and the responsible use of AI to evaluate the potentials and pitfalls of legal tech [VMW]. The main research question of NLawP is: "What are the risks and opportunities of using NLP technologies in the legal sector, and how can the design of these applications be influenced towards adaptability and the common benefit?" [VMW]

Our research aligns with NLawP's multi-perspective approach, enabling a comprehensive examination of the state of the art in legal tech and facilitating a forward-looking research agenda [VMW].

1.3. Outline

In the upcoming chapters, we will explore the gap between the theoretical and practical perspectives of legal tech. We begin this thesis in chapter 2, where we explain fundamental concepts and terms essential for a comprehensive understanding of subsequent chapters. Proceeding to chapter 3, we present our research questions (RQs), to define the precise scope of this thesis, and explain the methodology employed to address these questions. In chapter 4, we delve into the details of our research process, adding details to the execution of our interviews, including formulating interview questions and information about the participants. In the subsequent chapter, chapter 5, we will present the findings collected through both literature review and semi-structured interviews (SSIs), providing a nuanced view of the identified gap. The following discussion takes place in chapter 6, where we present the key findings derived from our research. At the end of this thesis, we will present our conclusions, in chapter 7, where we showcase our collected insights, offering a comprehensive summary of our findings and an outlook on potential future research of legal tech adoption.

2. Fundamentals

In this section, we provide a comprehensive overview of legal tech, presenting definitions and explaining how legal tech can be categorized in different manners.

2.1. Legal Tech Definitions

The term legal tech, a fusion of legal and tech, finds its simplest definition in its two components: where technology is used within the legal industry. A more nuanced and commonly used definition is offered by Goodenough. He distinguishes between *legal tech 1.0*, *legal tech 2.0*, and *legal tech 3.0*, categorizing applications based on their impact. Legal tech applications can be classified into one of these groups, each having increased capabilities as the previous group and consequently, a larger impact. [Goo15]

Definitions for all three groups are presented in 2.1:

Stage	Description
1.0	At this stage, computer systems play a supportive function, empowering the current human players within the current system.
2.0	Applications at this level become disruptive for individuals, with tools capable of overtaking simple steps in a larger process.
3.0	On the most advanced level, applications have a much higher potential to disrupt the system, permitting a radical redesign, if not a full replacement.

Table 2.1.: Legal Tech Classification According to [Goo15]

Another useful approach for systemizing legal tech applications is to sort them into different groups based on their purpose, such as the classification introduced by the *Stanford Legal Tech Database*, which uses nine categories: [Scha]

- Analytics
- Compliance
- Document Automation
- Legal Education
- Legal Research

- Marketplace
- Online Dispute Resolution
- Practice Management
- eDiscovery

2.2. Legal Tech Terminology

Legal tech is the commonly used term, although it is an abbreviation for *legal technology*. Given its widespread usage, we will stick to *legal tech*. Occasionally, the term *law tech* is also found, but can be used interchangeably.

In our interviews, various other terms were introduced, including *tax tech* and *office tech*. For the purpose of our research, we won't differentiate between those terms. We acknowledge debates around whether tax consultants and therefore *tax tech*, are part of the legal industry in the narrow sense. Similarly, while *office tech* was introduced to specify technology used in any office without necessarily having a connection to the legal industry, we won't make distinctions. Our goal is to gain a broad understanding of applications used in legal industry offices, discussing tools that may not be exclusively relevant to legal professions but are applicable in this industry.

3. Methodology

In this section, we explore the RQs that guide our investigation. Utilizing SSIs, we seek to obtain various insights. Before starting with the interviews, an interview guideline was meticulously prepared, which included a literature review.

3.1. Research Questions

Our research is guided by three fundamental RQs, presented in 3.1.

ID	Research Question
RQ1	How can the adoption of legal tech in academia and practice be effectively measured in terms of usage and impact?
RQ2	What is the current state of legal tech in practice, and what are the prevailing challenges and limitations compared to the current state of legal tech in academia?
RQ3	Which reasons or success factors influence the adoption rate of legal tech in practice, and how can barriers hindering adoption be addressed?

Table 3.1.: Research Questions

For RQ1, we looked for a theoretical framework by reviewing literature and studies on similar topics. The identified key elements influencing adoption rates guided the formulation of questions for our SSI guideline. RQ2 and RQ3 will be addressed through the insights gathered from SSIs. The objective of RQ2 is to comprehend the legal tech applications in practice and the challenges faced by legal practitioners. RQ3 aims to understand the reasons for successful or unsuccessful adoptions. We aim to collect and solve the challenges practitioners encountered during the adoption of legal tech applications.

3.2. Literature Review

To address RQ1, academic literature on technology adoption was explored. This review aimed to establish a robust theoretical framework to influence the creation of our interview guideline. Utilizing platforms such as *Scopus* and *Google Scholar*, we read over various academic literature to gain insights into prior research on technology adoption.

Our choice to avoid a structured literature review was grounded in the intention to prevent a strong focus on an unnecessarily extensive and restricted exploration of theoretic models but to focus more on the subsequent SSIs. The goal of this literature review was not only to answer the specific RQ1 but also to create a detailed understanding of the key elements influencing the adoption rates of legal tech in practice. By synthesizing insights from various sources and models, we aimed to have a solid foundation for the following formulation of questions for our SSIs, ensuring a comprehensive exploration of the following RQs.

3.3. Semi-Structured Interviews

When we compared data collection methodologies for insights through humans, the spectrum ranged from structured interviews to unstructured interviews. After careful consideration, we opted for the middle way, which are semi-structured interviews. This research design strikes a balance, offering both the comparability of structured interviews and the flexibility of the unstructured approach. Each interview adheres to a set of predefined questions, ensuring a degree of uniformity and empowering meaningful comparisons from one interview to another. However, their adaptive nature sets SSIs apart. Instead of strictly adhering to a predetermined script, they allow for dynamic and in-depth exploration of each participant's unique experiences. Unlike structured interviews, where participants respond to a fixed set of questions, the semi-structured format allows for personalized follow-up questions tailored to individual responses. This tailored approach adds a layer of depth to our data collection process, enabling us to delve into specific aspects raised by only a subsection of participants.

In summary, the choice of semi-structured interview reflects our commitment to a methodological approach that combines the benefits of structure with the flexibility needed to capture the nuanced differences of legal tech adoption in both academic and practical settings. This methodological flexibility aligns with the dynamic and evolving nature of the legal tech landscape, allowing us to extract rich, context- and occupation-specific insights from our diverse set of interviewees.

4. Interviews

In this chapter, we systematically explain our approach to conducting SSIs, emphasizing the systematicity used to extract valuable knowledge and insights. We start by explaining how we chose and found our interview participants in section 4.1. In section 4.2, we break down the structure of our interview questions and the overall approach. Then, section 4.3 covers the technical details of how we collected and analyzed the data. As we wrap up, section 4.4 offers a quick snapshot of our participants. Finally, in section 4.5, we discuss the ethical considerations in our interviews, emphasizing our commitment to ethical research practices.

4.1. Interviewee Recruitment

Our qualitative research aims to capture the diverse landscape of user stories, collecting an extensive set of challenges and success stories in legal tech adoption. Recognizing this, we've set criteria for participant selection, which are shown in 4.1.

Occupational Background	Participants must be employed in the field of law; This includes, but is not necessarily limited to, roles such as lawyers, judges, tax consultants, notaries, and academic legal tech researchers.
Geographical Consideration	Participants must live and work in Germany.

Table 4.1.: Selection Criteria for Interview Participants

The choice to include a heterogeneous group is based on our desire to gather varied perspectives. Our intention is not solely to focus on legal tech experts but to collect a broader spectrum of experiences within the legal landscape. Because of these research objectives, we are not including selection criteria, which is limiting ourselves to people considered legal tech experts. Regarding recruitment methods, we adopted a multifaceted approach to participant recruitment, with a primary emphasis on personal connections of first and second degree. This strategy, proven successful in past research, enhances the likelihood of participants' willingness to engage in the study. The recruitment channels listed in 4.2 have been used.

Out of the 28 potential interviewees contacted, 17 were successfully recruited. This underscores the effectiveness of our recruitment methods.

Strategy	Description
Personal Connections	These are individuals personally known to the researcher, fostering a sense of trust and openness in the interview process.
Second-Degree Connections	Individuals introduced to the researcher through a personal connection, expanding the participant pool.
Internet Approach	Contacting potential interviewees through online channels for a broader reach.

Table 4.2.: Recruitment Strategies for Interview Participants

4.2. Interview Structure

Adhering to the nature of semi-structured interviews, we developed a comprehensive interview guideline to provide a structured yet flexible framework for the researcher during the interviews. The guidelines structure comprises of the following sections:

1. **Demographic Questions:** To establish a foundational understanding of the interviewees' background.
2. **Understanding of Legal Tech:** Exploring participants' comprehension of legal tech concepts.
3. **Usage of Legal Tech:** Delving into the barriers, failures, and success stories in the adoption process, as well as the advantages, disadvantages, and challenges of legal tech applications.
4. **Legal Tech Research:** Focusing on the interviewees' perspectives on ongoing legal tech research. (Only relevant for academic legal tech researchers.)
5. **Outlook:** Exploring expectations, anticipated changes in legal tech usage, and engagement in legal tech organizations.

Following common SSI best practices, the guideline incorporates open-ended basic questions while allowing for flexible exploration through follow-up questions tailored to participants' responses. Since the interviews were conducted in German, the original interview guide is presented in German. For accessibility, we have included both the German version (in A.3) and an English translation (in A.2) in the appendix, ensuring a comprehensive understanding of the interview framework.

4.3. Data Collection and Analysis Process

The qualitative data collected during the interviews forms the cornerstone of our study and requires meticulous handling for further analysis. 16 out of 17 interviews were

conducted online, facilitated by Zoom¹, Teams², or Google Meet³, with audio recorded using OBS Studio⁴. Additionally, Zoho Bookings⁵ served as a scheduling tool, streamlining the coordination and timing of these interviews for an efficient process. To transcribe the recordings efficiently without compromising on quality, we implemented a two-staged approach. Initially, Whisper⁶ by OpenAI automatically transcribed the recordings. Subsequently, the transcriptions underwent meticulous enhancement through a manual review while listening to the recordings, ensuring accuracy and completeness of participants' expressions. The final transcripts were imported into MAXQDA24⁷, a specialized software for qualitative data analysis. MAXQDA24 enabled us to color-code topics in the transcripts, providing a visual representation of recurring themes and insights.



Figure 4.1.: Interview Process Visualised

4.4. Demographic Description of Interviewees

This subsection provides a comprehensive overview of our interview participants, with details about their occupational backgrounds, years of experience, and employers. Complete data can be found in the appendix in A.4.

Of the 17 participants, one can be classified as an academic researcher. At the same time, the remaining 16 are practitioners, adding an intentionally unbalanced practitioner perspective to our study, as visualized in 4.2.

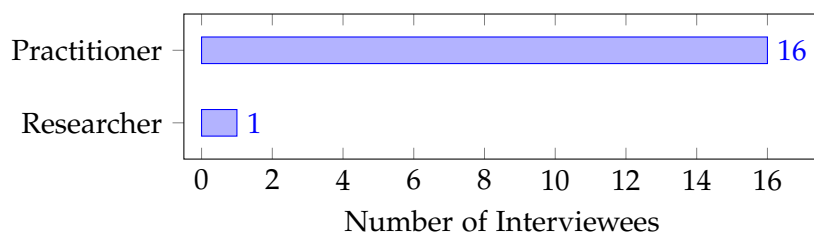


Figure 4.2.: Distribution of Participants: Practical vs. Academic Perspective

¹<https://zoom.us/>

²<https://www.microsoft.com/de-de/microsoft-teams/>

³<https://meet.google.com/>

⁴<https://obsproject.com/>

⁵<https://www.zoho.com/de/bookings/>

⁶<https://openai.com/research/whisper>

⁷<https://www.maxqda.com/new-maxqda-24>

Among the practitioners, eight are *attorneys*, one is a *notary*, three are *tax consultants*, two are *legal tech startup founders*, and two are *legal tech specialists* within large companies. This distribution is visualized in 4.3.

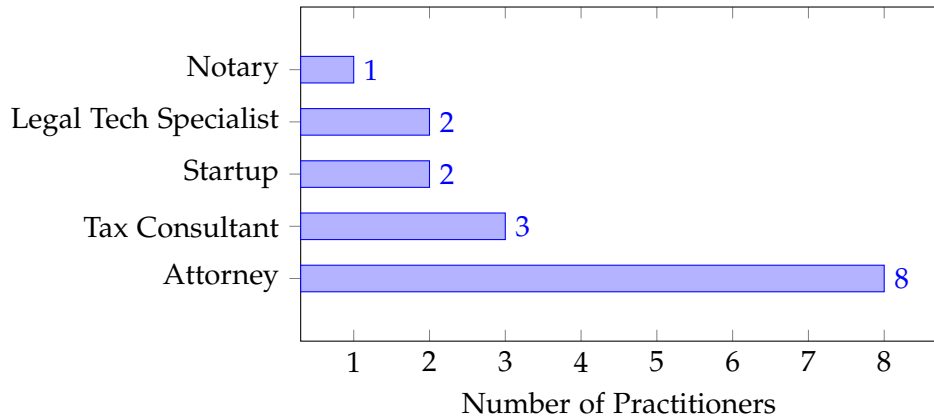


Figure 4.3.: Distribution of Practitioners: Occupation

Participants were asked about their years of experience in the field of law, revealing an average of 22.8 years, with a high deviation. This diversity in experience enriches our data set, capturing insights from both experienced professionals and those relatively new to the field. The distribution can be seen in 4.4.⁸

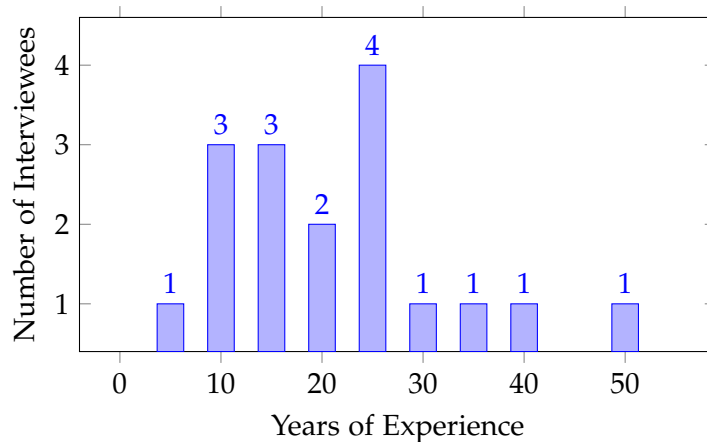


Figure 4.4.: Professional Experience of Participants

Regarding work settings, 11 practitioners operate in *typical law firms*, focusing mainly on legal work, while five work in *larger companies*, where legal tasks are not the primary focus.

The interviews were designed with a planned duration of 30-60 minutes to allow for in-depth exploration of topics. While mostly adhering to this general time frame, the

⁸To increase anonymity, years of experience have been rounded to the nearest multiple of 5.

actual duration varied slightly for some interviews, as shown in figure 4.5.

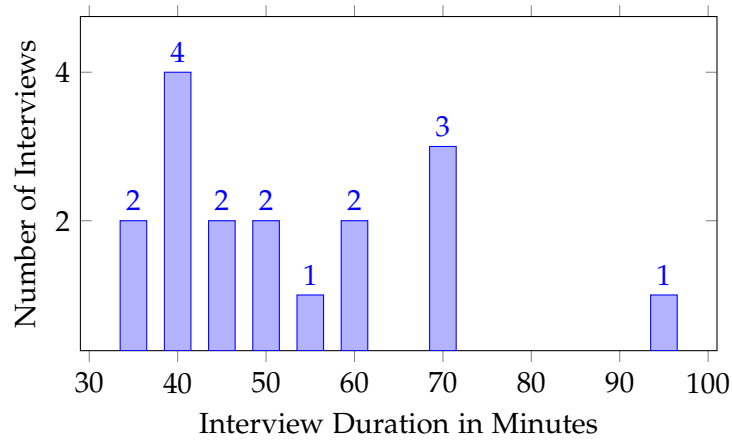


Figure 4.5.: Frequency Distribution of Interview Duration

We interviewed 15 male and two female participants, as visualized in figure 4.6. We will discuss this unbalanced ratio within the section limitations.

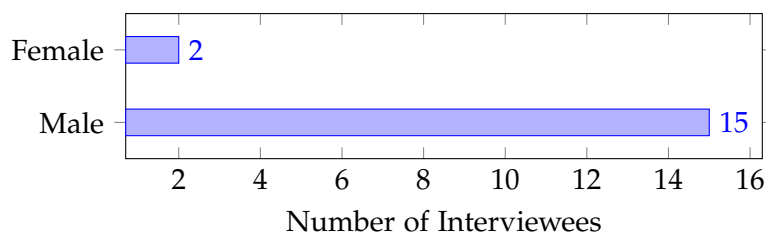


Figure 4.6.: Gender Distribution of Participants

4.5. Ethical Considerations

Ensuring ethical standards in our research is paramount. All interview participants were comprehensively informed about the research project and its scope. Furthermore, they were informed about the usage of the data gathered in the interviews, fostering transparency and trust.

To uphold participant privacy, all transcripts were completely anonymized. Each interviewee was assigned a unique ID (INT-xx, short for interviewee), allowing us to reference each individual without revealing their identity. This commitment to ethical standards reflects our dedication to responsible research practices.

5. Results

Having delved into the research question and the applied methodology in detail in chapter 3, and explored the interviews conducted as discussed in chapter 4, we now turn our attention to the climax of our investigation: the results. This section encompasses insights gained from the literature review, providing answers to RQ1 in 5.1. Finally, we delve into the collection of perspectives gathered through SSIs in 5.2, offering a comprehensive understanding of the legal tech landscape from the viewpoints of both academic researchers and practitioners.

5.1. Literature Review

In this section, we will briefly present the results found in literature, that guided us in developing the interview guideline. RQ1, which focuses on the effective measurement of technology adoption, specifically legal tech adoption, will be answered by presenting abstract models and theories.

5.1.1. Technology Acceptance Model and its Successors (1985)

The first model we are going to present is the Technology Acceptance Model (TAM), published by Fred D. Davis in 1985. In his publication, Davis aims to understand factors in the design and implementation of successful information systems and provide a practical basis for user acceptance testing. In his model, visualized in figure 5.1, he explains that the actual use of an information system is based on the *end users' attitude* towards using it. This attitude is determined by a user's *perceived usefulness* and *perceived ease of use*. Perceived ease of use has a causal relationship, influencing perceived usefulness, as a system that is easier to use is more useful [Dav85]. He defines the variable perceived usefulness as "the degree to which an individual believes that using a particular system would enhance his or her job performance" and perceived ease of use as "the degree to which an individual believes that using a particular system would be free of physical and mental effort." By weighing these relationships and using regression, he derives formulas that explain the correlation of those variables. As these are not relevant for our further study, we will not go into detail here [Dav85].

In the year 2000, V. Venkatesh and Davis proposed an extension to the original model: TAM2. While not altering the original relationships between variables, they introduced additional input variables and correlations between them. They incorporated the variable group of *social influence*, where subjective norm, image, voluntariness, and user experience influence perceived usefulness. The second variable group, *cognitive*

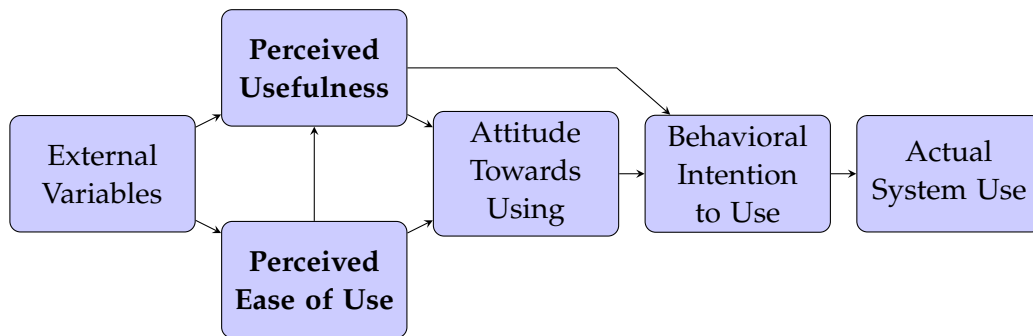


Figure 5.1.: Technology Acceptance Model, Own Figure, Based on [Dav85]

instrumental process, consists of variables titled job relevance, output quality, and result demonstrability [VD00]. In 2008, a paper about TAM3, the successor of TAM2, and TAM was introduced, aspiring to create one complete network of variables determining employees' information technology (IT) adoption. The model includes new relationships influencing perceived ease of use. These include *Computer Self-Efficacy*, a person's belief in performing a specific task with the help of a computer; *Perception of External Control*, the belief that supporting resources exist for the use of a system; *Computer Anxiety*; *Computer Playfulness*; *Perceived Enjoyment*; and *Objective Usability*, which focuses on the actual comparison of different IT systems rather than its perception [VB08].

These different models explain how they can provide valuable insights into the reasons and mechanisms behind employees' decisions to adopt and use IT. Managers can use these insights to make informed decisions about interventions in the adoption process.

5.1.2. Diffusion of Innovation Theory (1962)

The Diffusion of Innovation Theory, co-founded by Everett Rogers in 1962, seeks to explain how innovation is adopted. Although not specifically focused on legal tech or IT, the theory is applicable to any innovation. [Rog03]

Rogers posits that adoption is not a random event but is governed by a fundamental system. He identifies five factors influencing the adoption of innovation from an individual's perspective:

- **Compatibility:** How well does the adoption integrate with existing processes or applications?
- **Trialability:** Does the customer have the opportunity to try a demo before making a purchase?
- **Relative advantage:** Is this solution the best choice among several options?
- **Observability:** Are the benefits observable?

- **Complexity/Simplicity:** How complicated is the learning phase of an innovation?

These factors are internally and unconsciously examined and evaluated together, ultimately resulting in the decision to adopt or reject.

Rogers also introduces a well-known model categorizing end-users into those more likely to adopt at an early stage and those who will wait, acknowledging, that not every end-user adopts an innovation at the same time. He identifies five groups, listed from early to late adopters: *Innovators*, *Early Adopters*, *Early Majority*, *Late Majority*, and *Laggards*. This is visualized in figure 5.2.

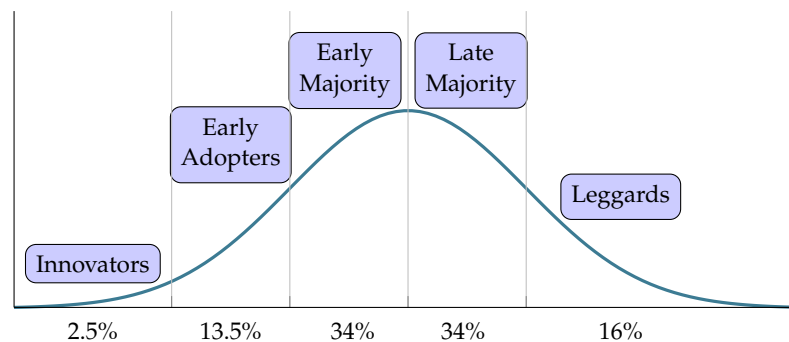


Figure 5.2.: Adoption Lifecycle, Own Figure, Based on [Rog03]

Although introduced earlier by Ryan and Gross, Rogers refines their systematization of the temporal steps in the adoption process. In addition to the factors presented above, an individual also goes through multiple stages in the adoption process [Rog03]:

1. **Knowledge:** An individual is presented with a new solution but does not know anything about it.
2. **Persuasion:** An individual is interested in the solution and seeks to gather more information.
3. **Decision:** An individual weighs the pros and cons and makes a decision to adopt or reject.
4. **Implementation:** An individual is convinced and adopts the solution.
5. **Confirmation:** Although already adopted, it requires confirmation that adoption was the right choice. Otherwise, solutions may be discarded after all.

5.1.3. Unified Theory of Acceptance and Use of Technology (UTAUT) (2003)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model, developed in 2003 by Venkatesh, who was already involved in the prior development of extensions of the TAM models, aspired to bring multiple models and theories together, unifying them into one comprehensive model. It is not surprising that this model includes elements

from the TAM models, but it refines relations and additionally adds more variables [Ven+03]. The model is visualized in figure 5.3.

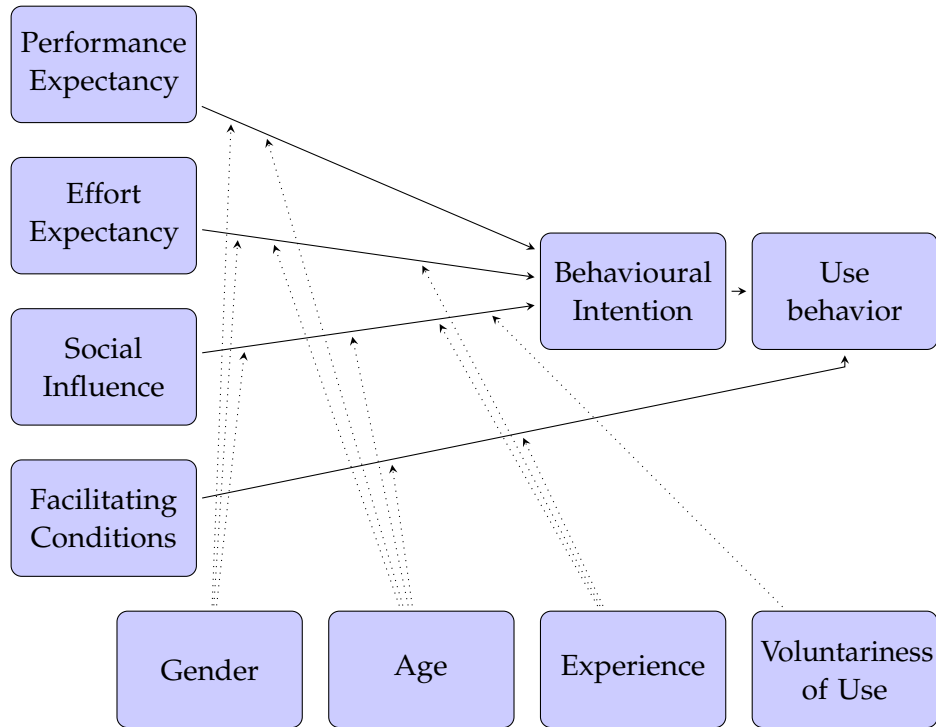


Figure 5.3.: UTAUT Model, Own Figure, Based on [Ven+03]

5.2. Semi-Structured Interviews

This section explores the results of our SSIs, providing an in-depth examination of how individuals conceptualize and interact with legal tech.

Consistent with the overarching interview framework, we will now navigate through a spectrum of insights, and explore specific viewpoints and higher abstract patterns. While certain sections, such as legal tech understanding, encapsulate responses from all 17 interviewees, others concentrate on subsets. For instance, particular sections feature insights exclusively from distinct professional categories, such as academic researchers or start-up founders. This approach aligns with the contextual relevance of the questions posed during the interviews.

Please Note: In the following, quotes from the interviewees presented have been translated from German to English by the researcher. The original quotes can be found in the appendix in A.1. All quotes got assigned a consecutive quote ID (short: Q-xx) The superscript text, e.g. ^{Q-xx} behind each direct quote will help find the corresponding German original.

5.2.1. Legal Tech Understanding

In this chapter, we delve into the diverse perspectives of our interviewees regarding the concept of legal tech. The responses have been categorized into the legal tech 1.0-3.0 framework, as introduced in chapter 2. This categorization allows us a structured analysis of the participants' understanding of legal tech.

Interviewees were probed on their comprehension of legal tech, revealing various perspectives. While three participants demonstrated familiarity with legal tech definitions and their classification into three impact-based categories, most responses reflected uninformed opinions. These responses have been systematically organized using Goodenough's definitions, showcased in 5.4.¹

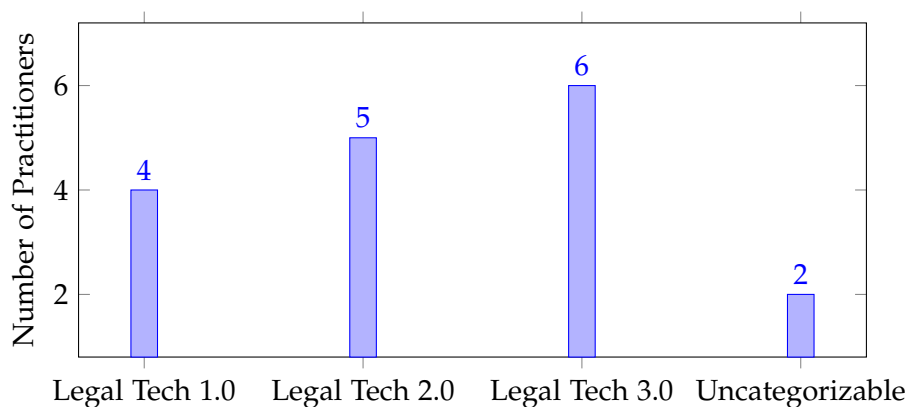


Figure 5.4.: Categorization of Interviewees' Understanding of Legal Tech

A few illustrative examples include:

- INT-02 describes legal tech as the "Automation of legal applications with IT,"^{Q-1} aligning with the characteristics of legal tech 2.0.
- INT-04 conceptualizes legal tech as "thinking in holistic processes"^{Q-2} within the document life cycle, emphasizing the shift from paper to digital processes, indicative of legal tech 1.0.
- INT-10 extends the understanding, stating, "legal services are being replaced or supplemented by technology, no doubt by artificial intelligence,"^{Q-3} classifying this interpretation as legal tech 3.0.

However, it is important to note that not all interviewee definitions seamlessly align with a single category. Please note that INT-11 and INT-16 belong to the group *Uncategorizable*. Instances of this complexity include:

- INT-05 provides valuable insight into the evolution of the term legal tech over the years. Initially encompassing the transition from traditional paper-based

¹Full classification can be found in the appendix in A.4.

practices to digital tools, the definition has matured into a focus on advanced digital solutions.

- For INT-11, legal tech only refers to business-to-consumer tools and not the tools that focus on lawyers or other law-related professions.
- INT-16 introduces a critical perspective, suggesting that the term legal tech might not fully capture the complexity of the challenges faced in the legal field. He says, "It only describes a really small part of the overall challenges that we actually face." Q-4
- INT-17 adopts a comprehensive view of legal tech and the law system in its entirety. The term describes not only specific use cases but "must be interlinked with the legal requirements that regulate the activity itself." Q-5

This diverse set of definitions provides a comprehensive starting point for understanding what legal tech means for our 17 interviewees. It lays the groundwork for more detailed discussions in subsequent sections, allowing us to delve deeper into their perspectives and experiences.

5.2.2. Legal Tech Applications Usage

Next, we present the interviewees' usage of legal tech applications. As interviewees understand various, results include many different tools and use cases. Given the diverse interpretations of legal tech, the results encapsulate a broad spectrum of tools and use cases. While the debate may arise regarding classifying specific tools and use cases as legal tech, we will present them as articulated during the interviews.

To present the findings systematically, we categorize the usage of legal tech applications within the framework introduced in Table 5.1. Each category is described and additionally explained by illustrative examples. This approach aims to provide a structured exploration of the various ways in which legal tech is utilized in professional contexts, offering insights into the practical landscape as perceived by the interviewees. Although influenced by the systematization by Stanford introduced in 2, the following reflects our own systematization of the mentioned tools.

- **Tax-Specific Programs:** Given the specialization of three practitioners in tax consultancy, using tax-specific programs like DATEV and Steuersoft is unsurprising. These tools play a crucial role in generating tax declarations for clients. Notably, DATEV goes beyond mere document creation, offering interfaces to various applications, including tax authorities — an aspect highly valued by the interviewees. Another application mentioned is Unternehmen Online, which allows tax consultants to digitally receive accounting documents from clients.
- **Document Creation:** Respondents highlighted the recurring need for document creation, whether as a notary or through contract drafting by attorneys. Diverse

Application Category	Interviewees
Tax Specific Programs	INT-01, INT-03, INT-05
Document Creation	INT-02, INT-10, INT-14, INT-15, INT-16
Online Databases	INT-02, INT-03, INT-09, INT-11, INT-12, INT-14
Online Meeting Applications	INT-01, INT-03, INT-05, INT-13, INT-15
Document Management	INT-01, INT-02, INT-03, INT-05, INT-08, INT-10, INT-13, INT-14, INT-15, INT-16
Communication Platform	INT-01, INT-04, INT-05, INT-08, INT-09, INT-14, INT-16
Law Firm Management	INT-08, INT-09
Generative AI	INT-12, INT-16
Knowledge Management	INT-14, INT-16
Analytics	INT-05, INT-10, INT-14, INT-15, INT-16
eDiscovery	INT-10, INT-14

Table 5.1.: Legal Tech Application Usage by Practitioners

solutions were reported: For example a self-developed tool for standardized and frequently used documents, such as non-disclosure agreements used by INT-10. Collaborative document creation solutions are employed by INT-15, dealing with intricate corporate cases, where "many people [...] want to edit a document concurrently." (INT-15) ^{Q-6} He also employs Briefcatch, which aids in drafting documents by providing formulation suggestions, ensuring clarity and precision.

- **Online Databases:** Online databases, with Beck Online at the forefront, were mentioned as integral for accessing legal texts, regulations, comments, and case law texts. While Beck Online was praised for its comprehensive features and richness of data, other databases were mentioned, being more modern but lacking data compared to Beck Online.
- **Online Meeting Applications:** As 16 out of 17 interviews have been conducted via an online meeting platform, we see that almost all have those platforms available. However, we only present applications, actively mentioned by practitioners. With the use of online meeting platforms, we have to differentiate between internal communication, meetings with clients, or even digital court hearings. Commonly utilized for informal meetings with clients, a practice that is often highly desired by clients. INT-02, working as a notary, also had online notarizations with clients via an online meeting platform. Attorneys also employed online meeting platforms for court hearings.
- **Document Management:** Document Management describes in contrast to document creation the structured storage of documents. While those tools are mostly not specific to the field of law, DATEV's Document management system (DMS), as

mentioned by INT-05, brings an example of a specialized tool used in the legal context.

- **Communication Platform:** While email remains one of the most commonly used methods for communication, both internally and with clients, other solutions are also being used. For internal communication, it appears to be especially interviewees from larger companies, which have (self-developed) communication platforms that connect communication to a client's file or case, so that it's easily discoverable afterward and can be accessed by all involved. For external communication, one prevalent tool mandated for use by attorneys is the *besonderes elektronisches Anwaltspostfach* (translates: special electronic mailbox for lawyers) (beA). Other examples of communication platforms include two other interviewees: INT-04 utilizes Digibase in his company, enabling him, from an employee perspective, to digitally print any document of interest. This document is subsequently sent to the Digibase platform, which includes a comprehensive database of all clients. In cases where the client has consented to digital communication, they receive an email notification prompting them to retrieve their documents on the platform. If the client has not agreed or fails to access their documents within a specified timeframe, the documents are printed in a central printing facility and dispatched via postal service. Another example includes INT-05, which has a solution in place, that allows her to efficiently communicate through the use of template messages and more, which are especially valuable in standardized processes and cases that appear often.
- **Law Firm Management:** Law firm management software manages clients and cases in a law firm, with the most prominent solution being RA-Micro. Administrative things, like billing and accounting, are often done via this software. Often, law firm management software is also integrated and used with the *Digitale Akte*.
- **Generative AI:** Generative AI in the form of text production is used by one interviewee. He says ChatGPT is good for brainstorming and formulation of general texts, cautioning against inputting confidential client information: "Of course, I wouldn't put any confidential client information in there either." (INT-12) Q-7 Another interviewee mentioned active experimentation with generative AI solutions within their large organization. (INT-16)
- **Knowledge Management:** Knowledge management refers to platforms, which store general knowledge of a firm. These platforms store general firm knowledge, streamlining access and collaboration across various locations. INT-16's company adopted a new solution recently, recording details of all law firms they are currently or have previously worked with worldwide, facilitating quick access for outsourcing work at subsidiary companies.
- **Analytics:** While analytics in legal cases were mentioned by INT-14, detailed specifics were not extensively provided.

- **eDiscovery:** eDiscovery describes the analysis of documents in order to find specific information. One solution, Lawlift is for example used by INT-10, who is working at a big company, to analyze previous contracts and find patterns, which he then applies in the creation process of new contracts.

5.2.3. Legal Tech Benefits

In this section, we explore the array of benefits attributed to the utilization of legal tech applications, as reported by practitioners. The insights gathered are based on the practical experiences of participants, highlighting benefits that have already been realized. It's important to underscore that the motivations for adoption could include expected benefits that may not have occurred.

In totality, practitioners articulated 20 distinct benefits, ranging from highly specific advantages tied to particular use cases to more universally applicable enhancements. To present these benefits comprehensively, we have categorized them into five overarching groups reflecting the nature of improvements observed:

1. Efficiency Improvements
2. Quality Improvements
3. Environmental Improvements
4. Financial Improvements
5. Other Improvements

Below, we present all 20 benefits disclosed by the interviewees in table 5.2. Each benefit was assigned to an ID (BEN-xx, short for benefit). The table categorizes each improvement into one of the aforementioned groups, aligning with the intended outcomes articulated by the interviewees. It is worth noting that certain benefits may resonate across multiple categories, and the categorization serves as a contextual framework rather than a strict hierarchy. The third column of the table references the participants from whom each specific benefit was mentioned. This, however, should not be interpreted as a quantitative examination of the benefits in order to create a priority list, but more, to contextualize the reported advantages.

- **BEN-01 - Reduction of redundant work:** The centralization of data interconnected with subsidiary programs through Application programming interfaces (APIs) emerges as a solution to mitigate the repetitive nature of data entry. INT-02 emphasizes this efficiency, stating, "This new program enables entering the data once and then accessing it repeatedly,"^{Q-8} highlighting the streamlined approach of inputting data once and accessing it seamlessly.

ID	Benefit	Category	Interviewees
BEN-01	Reduction of redundant work	Efficiency	02
BEN-02	Increased Efficiency in terms of time savings	Efficiency	02, 03, 04, 05, 09, 12, 13, 15
BEN-03	Concurrent access to files	Efficiency	03
BEN-04	Increased availability of documents	Efficiency	09
BEN-05	Increased Flexibility / Efficiency because of centralized data access	Efficiency	09, 10, 14
BEN-06	Reduction in cost	Efficiency	09, 15
BEN-07	Reduction in office space	Efficiency	01, 09
BEN-08	Decreased usage of paper and printing supplies	Environm.	04, 12
BEN-09	Reduction of travel expenses	Environm.	09
BEN-10	Decreased usage of paper and printing supplies	Financial	04, 09, 12
BEN-11	Reduction of travel expenses	Financial	09
BEN-12	Increased Flexibility in terms of place of work	Other	02
BEN-13	Increased Attractivity as an employer	Other	02
BEN-14	Weight Reduction of working equipment	Other	09
BEN-15	Access to Justice	Other	07
BEN-16	Reduction of disruptions in media	Quality	02
BEN-17	Increased Security	Quality	02, 05
BEN-18	Increased Quality of data	Quality	02
BEN-19	Increased awareness of edge cases	Quality	03
BEN-20	Increased access to multiple versions of e.g. laws	Quality	09, 13

Table 5.2.: Benefits of Legal Tech Applications

- **BEN-02 - Increased Efficiency in terms of time savings:** Adopting the Digitale Akte results in efficiency gains and substantial time savings. INT-09 elaborates, "There are already elegant features where you can process mail even faster than if you have paper." ^{Q-9}
- **BEN-03 - Concurrent access to files:** Centralized digital systems empower offices to work collaboratively and concurrently on the same files. INT-03 appreciates this collaborative aspect, noting, "then also the secretariat has access to these things," ^{Q-10} highlighting the convenience of shared accessibility within the legal team.
- **BEN-04 - Increased availability of documents / BEN-05 - Increased Flexibility / Efficiency because of centralized data access:** The benefits of increased document

availability, flexibility, and overall efficiency emerge from the centralized access to digital data. INT-09's testimony reflects the flexibility gained in handling court hearings and the accessibility of documents online, contributing to a dynamic and efficient legal practice. E.g. representing a sick colleague in court also becomes possible.

- **BEN-06 - Reduction in cost:** Referring to direct savings. INT-09 says that by opting for digital over printed materials, direct cost savings were achieved. At this point, we want to highlight, that reduction of cost can also be indirect, but wasn't mentioned by interviewees explicitly as a benefit.
- **BEN-07 - Reduction in office space:** The transition to digital files directly addresses spatial concerns within legal offices. Acknowledging that paper files and printed materials consume significant office space underscores the space optimization achieved through digitization. This not only aligns with modern workplace trends but also contributes to a more organized and efficient office environment. (INT-01)
- **BEN-08/BEN-10 - Decreased usage of paper and printing supplies:** Environmental and financial benefits results from the decreased reliance on paper and printing supplies. INT-04's assertion that adopting Digibase leads to "substantial paper savings" ^{Q-11} highlights the positive impact of legal tech on resource consumption.
- **BEN-09/BEN-11 - Reduction of travel expenses:** INT-09's opinion underscores the efficiency gained by avoiding extensive travel for court hearings, which he used to do all across Germany. Beyond financial savings, this benefit aligns with his goal to reduce his emission footprint.
- **BEN-12 - Increased Flexibility in terms of place of work:** Digitization introduces increased flexibility in the workplace, enabling legal professionals to work from diverse locations. This benefit, closely tied to the subsequent advantage, reflects a transformative shift in the traditional office-centric model, offering practitioners the autonomy to manage their work from various places.
- **BEN-13 - Increased Attractivity as an employer:** The ability to offer remote work, facilitated by legal tech, enhances the attractiveness of legal practices as employers. "As a modern employer, you must be able to offer home office." (INT-02) ^{Q-12} His perspective highlights the evolving expectations of modern employees and the role of digitization in meeting those expectations.
- **BEN-14 - Weight Reduction of working equipment:** The transition to the Digitale Akte results in a tangible reduction in the weight of working equipment. INT-09's experience of attending court hearings with just an iPad, as opposed to carrying multiple folders, shows legal tech benefits by reducing physical burdens.
- **BEN-15 - Access to Justice:** Access to justice is a prominent benefit often associated with legal tech applications. While less frequently mentioned in interviews, INT-07

emphasizes the potential to extend legal consultations to "Clients who might never be able to afford an individual consultation." ^{Q-13} This societal impact aligns with the broader narrative of legal tech democratizing access to legal support.

- **BEN-16 - Reduction of disruptions in media:** Large IT systems with good APIs "reduce disruptions in media" ^{Q-14} by eliminating the need for physical paperwork and outdated communication methods like fax machines. (INT-02) This seamless integration streamlines processes, ensuring smoother workflows and reducing inefficiencies associated with manual interventions.
- **BEN-17 - Increased Security:** The adoption of digital platforms with meticulous access management enhances the security of legal practices. INT-05's emphasis on the secure environment provided by a digital platform in her large organization underscores the importance of safeguarding sensitive information.
- **BEN-18 - Increased Quality of data:** Centralization of data as a single point of truth contributes to the increased data quality, because "If I have to write a name ten times, then I have a chance of spelling it wrong ten times." ^{Q-15} INT-02's observation of data consistency and accuracy resulting from a central system highlights the pivotal role legal tech plays in mitigating inconsistencies and ensuring reliable and high-quality information.
- **BEN-19 - Increased awareness of edge cases:** Legal tech solutions aid practitioners in recognizing and addressing edge cases that might be overlooked manually. INT-03 thinks a DATEV feature that alerts to potential issues improved his work, as "the program warns or spits out certain information, such as that there could be a tax somewhere that I can't see at first glance," ^{Q-16} improving the overall quality of legal work.
- **BEN-20 - Increased access to multiple versions of e.g. laws:** Online databases offer legal professionals increased access to both current and past versions of laws. INT-09's appreciation of this capability ensures practitioners stay up-to-date while also having historical references readily available: "I always have the current version and I also have the option of saying that I would like to have the law as it was 5 years ago." ^{Q-17}

5.2.4. Legal Tech Adoption Process

In this section, we will explore topics and patterns found in the legal tech adoption process, which are neither problems nor success stories.

- **Bottom Up vs. Top Down:** Among the interviewees, only two participants articulated a comprehensive strategy for legal tech adoption and implementing new software within their organization. According to INT-14, their strategy, developed after the introduction of Microsoft's Power Platform, comprises two

key components: "We have a digitization strategy that essentially consists of two components." Q-18 The top-down approach is invoked for enforcing compliance with global rules or laws, utilizing directives or work instructions without extensive input in the implementation phase from employees (INT-14). For the user, the bottom-up approach allows for "Solving dedicated island problems with small applications." (INT-14) Q-19 According to INT-14, this approach is more important, fostering user engagement and ownership, as users are not forced into adopting unfamiliar tools. The internal structure comprises key users and coordinators, acting as "catalysts within the business" Q-20 and advocating for the tool while offering initial support (INT-14).

- **Technical vs. Organization Solutions:** Several participants emphasized the importance of change management in legal tech adoption: "People overestimate the technical solution and ultimately underestimate this whole area of change and transformation." (INT-16) Q-21 The challenge lies in ensuring user daily engagement with the solution, posing the question of "how to encourage users to utilize the solution or system on a day-to-day basis." (INT-16) Q-22 This participant suggested that the term legal tech conveys a misleading message, preferring to frame discussions within the broader context of "digital transformation". (INT-16) Q-23 Factors such as organizational structure, mindset, skills, and drivers of change are identified as crucial elements in the adoption process (INT-16).

It is also important to measure adoption inside an organization, which INT-14 explains: "We have either a directive or an instruction, which basically stipulates that a process must be followed. These are usually not tool-based, but process-based." Q-24 Those instructions are assessed annually through "control requirement assessments," Q-25 in which they review the following of instructions. (INT-14)

- **Necessity of Real World Knowledge to Develop Appropriate Solutions:** Interviewees underscored the importance of legal tech responsible persons understanding the actual processes of legal practitioners: "In some cases, I have the feeling that the solutions that are being developed on the market are being developed without taking into account the needs and requirements of legal departments." (INT-16) Q-26

Key stakeholders may fail to comprehend the multifaceted nature of real-life scenarios, as expressed by INT-02, who noted that "life is usually more diverse than software developers imagine." (INT-02) Q-27 It was also highlighted that legal tech solutions sometimes lack the necessary specificity to cater to a broad target audience, as INT-16 argued that there is often "insufficient differentiation" Q-28 regarding the end-users and their specific requirements (INT-16).

- **Drivers for Change:** While detailed benefits of legal tech solutions are discussed further in 5.2.3, understanding the motivating factors behind the implementation and adoption of new applications is important. INT-15 highlighted that their

adoptions were primarily driven by the desire to address existing problems within the legal practice, stating, "that we simply have a problem in the law firm or in this operational process, it bothers us, and we want to change it." (INT-15) ^{Q-29} While this motivation may not be universal across all organizational sizes, INT-16, working at a large company, emphasized that their decision was purely functional, stating, "There were no make-or-buy decisions based on monetary aspects. It was really functionally driven." (INT-16) ^{Q-30}

INT-04 offered a unique perspective, emphasizing that social and ecological aspects automatically follow when focusing on economic aspects. He explained, "And it will always have a social component because the employee who doesn't waste time has less stress." (INT-04) ^{Q-31}

Additionally, INT-02 highlighted external pressures, stating that legislation is subtly nudging notaries towards digitization, and clients are expressing expectations such as "the document is sufficient for us digitally, we don't want any paper anymore." (INT-02) ^{Q-32}

5.2.5. Challenges in the Adoption Process

In exploring the challenges encountered during the adoption process of legal tech applications, participants were invited to share insights into the practical challenges and barriers they confronted. These challenges encompass both difficulties successfully navigated and obstacles leading to non-adoption. The following discussions have been organized into various topics, allowing for a comprehensive examination in this section. Through a categorization process, similar challenges raised across interviews have been grouped under overarching themes. The subsequent discussion will feature challenges encountered by individual participants or, in some instances, by multiple participants. Each challenge or thematic concern will be explained, accompanied by illustrative examples. Not all instances of a specific challenge are discussed in every detail, but rather, a representative selection is presented.



Figure 5.5.: Challenge Categories, Including the Number of Challenges per Category

We are going to structure the following set of problems into four groups, depicted in 5.5, and present specific challenges related to each topic.

User-related Challenges

In this subsection, we will explore challenges that can be grouped as user-related challenges, outlined in 5.3. Each challenge was assigned to an ID (HUM-xx, short for human).

ID	Challenges
HUM-01	User Competency and Qualifications
HUM-02	Resistance and Skepticism
HUM-03	Generational Divide and Training Needs
HUM-04	Professional Appearance
HUM-05	Resistance to Change
HUM-06	Lack of Process Questioning
HUM-07	Doubts in Benefits
HUM-08	Human Judgment and Empathy in Legal Cases

Table 5.3.: User-related Challenges in Legal Tech Adoption

- HUM-01 - User Competency and Qualifications:** INT-02, a proprietor of a notary firm, underscores the significance of employee competence in grappling with legal tech. He notes that software and IT systems often demand specialized skills, leading to an increased emphasis on the qualifications of his staff. In his words, "The essential thing is the employee factor." ^{Q-33}
- HUM-02 - Resistance and Skepticism:** INT-04 acknowledges the necessity of user competency but points out the difficulty in onboarding individuals resistant to or skeptical about changes. He emphasizes the importance of active engagement and understanding the application, cautioning against unrealistic expectations of complete self-explanatory features: "It doesn't work for some people, because there are people who say that there are very few little things that they expect to be completely self-explanatory." ^{Q-34} INT-12 echoes this opinion, attributing resistance to the inherent conservatism within the legal field, particularly in smaller firms: "I don't think there is really a drive in the legal profession to actively develop this now." ^{Q-35}

Other participants agree with this general image of lawyers, and other law-related professionals being "conservative", (INT-10) ^{Q-36} or "hostile to automation and standardization". (INT-06) ^{Q-37}
- HUM-03 - Generational Divide and Training Needs:** INT-11 highlights a generational gap at his firm, affecting the adoption of legal tech. He observes that

senior colleagues are often overwhelmed by the adoption speed of technology, influencing the firm's overall pace of tech adoption.

- **HUM-04 - Professional Appearance:** INT-11 underscores the role of professional appearance in the legal profession, emphasizing the importance of portraying oneself as indispensable and not easily replaceable by technology. He says that maintaining a professional image is challenging with the use of legal tech, either in court or in front of a client. He also explained, that this professional appearance is the reason for clients trusting him, which he cannot achieve with the use of legal tech (INT-11).
- **HUM-05 - Resistance to Change:** Instances of resistance to organizational changes were noted, with interviewees having experiences of opposition from both departmental staff and higher executives: "I wasn't able to push through here because of the resistance to such stories in the company." (INT-13) ^{Q-38} Resistance often stemmed from concerns about job security and the perceived impact on existing workflows.

Another example project which failed, was when INT-09 at his firm introduced an infrastructure for secure communication with clients. The proposed idea, that email communication with clients could be secured by giving them encryption resulted in only one customer requesting such a key. (INT-09)

- **HUM-06 - Lack of Process Questioning:** We have begun this chapter, among other things, by introducing INT-04's understanding of legal tech. He highlighted the importance of "thinking in holistic processes." ^{Q-39} This refers to the overall process, e.g. from the beginning of a legal case, until it is closed. The tendency to adhere to established working processes was seen as both an "inconvenience and [...] a resource-wasting practice". ^{Q-40} Legal tech applications often cannot be integrated into an existing process, but - especially with more advanced solutions - it requires them to overthink the process and change the process to be as effective as possible.

Another example is INT-05, employed at a large company with numerous offices across Germany and internationally. The company introduced a new document management tool. However, due to the lack of uniform processes across all offices, the tool did not provide the expected benefits. According to INT-05, understanding the adoption of a tool should always be coupled with the changes in processes to ensure that both aspects progress hand-in-hand.

- **HUM-07 - Doubts in Benefits:** Some interviewees expressed skepticism about the alleged benefits of legal tech tools. Concerns included doubts about time savings, as INT-02 says, he is "still faster with traditional literature research methods on paper" ^{Q-41} or the quality of available solutions in the market: "To be honest, there's a lot of junk in circulation now." (INT-08) ^{Q-42} INT-10 has an advanced automatic document creation tool in use, but says, he has only experienced neglectable

benefits, "A little bit, I would say. But now I would say not really substantially," Q-43 as they previously already used templates, which were already efficient. (INT-10)

One participant also mentioned, that they expected software to have features, which were unmet: "It was once advertised as being like a Google search, but that's not the case." (INT-05) Q-44 INT-14 says, they always want to have a detailed "proof of concept" Q-45 from the suppliers of a legal tech solution with all relevant features before they begin with internal implementation to tackle his problem, as he experienced suppliers "overpromising" Q-46 in the past. (INT-14)

- **HUM-08 - Human Judgment and Empathy in Legal Cases:** Legal tech's potential to replace the personal and empathetic aspects of legal practice was a recurring theme. Participants, such as INT-11, emphasized the essential role of personal relationships and trust in areas like medical cases and negotiations, which cannot be easily automated or replaced by technology. Writing a contract is also only a small part of their work, according to INT-12. He says, "Our consulting relates a lot to negotiations, i.e. where it is a matter of negotiating solutions with the other side," Q-47 and this cannot be performed by a computer (INT-12).

Organizational Challenges

In this subsection, we are going to explore challenges that can be grouped as organizational challenges, presented in 5.4. Each challenge was assigned to an ID (ORG-xx, short for organizational).

ID	Challenges
ORG-01	Time Constraints
ORG-02	Financial Limitations / High Costs
ORG-03	Uncertainty in Decision-Making
ORG-04	Scale and Limited Resources in Law Firms
ORG-05	Complexity Introduced by New Tools
ORG-06	Appeal of Alternatives in the Market

Table 5.4.: Organizational Challenges in Legal Tech Adoption

- **ORG-01 - Time Constraints:** Despite time savings being already touted as a benefit of legal tech applications, participants highlighted the time required for implementation as a significant challenge. INT-01, who had previously been more open to adopting new technologies, expressed a constraint on her ability to continually explore innovations due to time limitations. Although she would like to, she cannot "jump on every new idea and say, okay, I'll test that now because I just don't have the time anymore." (INT-01) Q-48

- **ORG-02 - Financial Limitations / High Costs:** The high costs associated with legal tech applications posed challenges for many participants. INT-11 emphasized a strict financial approach, refusing to implement solutions exceeding the cost of previous alternatives. Their ultimate goal is to minimize running costs. INT-13, who is responsible for managing the rental of about 70 properties, has reviewed a solution that could help him with that: "It was interesting, but the financial investment, with 70 apartments and commercial units, was too high." (INT-13) Q-49 Financial considerations also influenced the demand for legal services from a client's perspective, as noted by INT-07. He explains "The industry is presumably confronted with a certain increase in price awareness on the part of clients due to the use of AI and legal tech." (INT-07) Q-50
- **ORG-03 - Uncertainty in Decision-Making:** Decision-making uncertainty emerged as a challenge, not only in small firms. One interviewee said, they often have legal tech projects, "where you don't really know at the beginning, does that help me later on?" (INT-15) Q-51 While big companies tend to have more experience in those changes, and analyzing benefits and calculating financial benefits, small firms have problems with that. One start-up founder, who previously worked in a traditional law firm, added, that investing lots of money into a legal tech application is "For a law and tax consultancy firm, this is of course no ordinary undertaking," Q-52 as it required a huge investment up-front, where traditional law firms usually don't do big investments, but have only running costs, directly proportional with clients and mandates. (INT-07) Before developing their solution, they also lacked information about the "potential customers' willingness to pay." (INT-07) Q-53
- **ORG-04 - Scale and Limited Resources in Law Firms:** In the previous chapter, we already presented interviewees' organizations in terms of size. Generally speaking, participants who do not work for big companies, which are the majority, expressed the lack of resources to tackle big projects and described their organization as too small. In contrast, larger firms with more resources were noted for their ability to invest in advanced legal tech solutions: "It is also the large law firms, for example, that are now using these contract generators and analysis systems because they also have the money." (INT-12) Q-54

One participant said they have done all the preparation to use an eDiscovery solution in his firm, but says, it requires big cases, with a lot of documents, so that this solution would be worth it. However "In the end, however, these masses of documents did not actually come in the mandates." (INT-15) Q-55
- **ORG-05 - Complexity Introduced by New Tools:** INT-04 thinks, it's not always enough, to have good solutions, when the process gets more complicated through introducing this tool. They used to send documents primarily via post. When they introduced a new solution, Digibase for both - digital and physical - communication, they faced a new problem: The system required an address field on the first page of a document, which not all documents created through a document creation

system had. This resulted in additional manual work because after triggering the document to be sent through the application, users had to open another system, Digibase, where they manually had to specify the receiver's address. Even though, this already was a substantial improvement in time compared to manually printing and sending the documents, user adoption was low, and frustration was high because the new process involved an additional tool. Overcoming this complexity required adjustments to the document creation program, resulting in the elimination of the manual linking of documents to receivers. After that, user adoption was much higher, as expected. INT-14 knows such problems as well; he says, "At the end of the day, the user has to realize that the tool is helping me." Q-56 This can only happen, and it is very important, that "the tool must work right from the start and bring added value." (INT-14) Q-57

- **ORG-06 - Appeal of Alternatives in the Market:** Larger companies tended to explore alternatives such as outsourcing, despite being able to address certain tasks through legal tech solutions. INT-10 mentioned outsourcing due diligence tasks to external law firms, while INT-14 described the establishment of a service hub in Portugal for manual reviews, emphasizing the benefits of both cost-effectiveness and improved quality. Interviewees working at bigger companies tend to have more use cases, which they can tackle from a higher perspective and where they can formalize the process. This did not always result in automation, but also in outsourcing. "We commission external lawyers for this due diligence," (INT-10) Q-58 despite having the capability to address certain tasks through legal tech solutions. Also, INT-14 adds, that they have decided to go with "a Legal Process Outsourcing Provider" Q-59 where they can "be able to trigger manual or manual reviews at relatively low cost." Q-60 (INT-14) According to him, results were also of better quality, because they received not only technical but lawyer-verified results. (INT-14)

Market and Industry Challenges

In this subsection, we will explore challenges that can be grouped as Market- and Industry-related challenges, presented in 5.5. Each challenge was assigned to an ID (IND-xx, short for industry).

- **IND-01 - Bureaucratic Hurdles:** One prevalent challenge identified in the legal tech landscape, particularly in the German context, is the formidable bureaucratic hurdles. As INT-03 describes it: "So we have this bureaucracy problem. It's just a huge problem. It's also a locational disadvantage." (INT-03) Q-61 This sentiment is shared among participants, with INT-01 highlighting instances where the mandatory requirement for tax consultants to send printed and signed invoices poses an unnecessary obstacle.
- **IND-02 - Diverse Development Stages Across Stakeholders:** Communication

ID	Challenges
IND-01	Bureaucratic Hurdles
IND-02	Diverse Development Stages Across Stakeholders
IND-03	Competition Absence in the Public Sector
IND-04	Scarcity of Alternatives in a Monopolistic Market
IND-05	Dynamic Nature of Legal Changes
IND-06	Restricted Control Over the Entire Process
IND-07	Time-Based Billing in Legal Practice
IND-08	Challenges in Liability Management
IND-09	Limited Understanding of Complex Legal Problems

Table 5.5.: Market and Industry Challenges in Legal Tech Adoption

intricacies emerge as a substantial challenge in legal tech adoption, as expressed by INT-04. He notes that despite the majority of documents being generated digitally, they often revert to traditional postal methods for distribution, stating, "99.99 percent of them are all on a computer somewhere [...] in the end it is sent by post and has to be scanned in again." (INT-04) ^{Q-62} Notably, processes involving multiple stakeholders, such as attorneys, courts, and bailiffs, are difficult, with INT-09 emphasizing the different development stages among these entities.

Moreover, the digitization progress among judges, even within the same group of stakeholders, varies. Instances were presented where digital requests were initially made but were later requested in paper form and vice versa (INT-09).

- **IND-03 - Competition Absence in the Public Sector:** In the previous paragraph, we have already discussed the different development stages of different players. These differences may be for various reasons, but one problem, which hinders the overall adoption is the absence of market competition in the public sector like public authorities or courts, in contrast to the competitive landscape faced by lawyers and notaries. This lack of competition results in a very slow adoption especially in the public sector (INT-03).
- **IND-04 - Scarcity of Alternatives in a Monopolistic Market:** The legal tech software market in Germany is characterized by a limited number of dominant companies serving specific niches. For instance, DATEV dominates the market for tax consultants (INT-01), RA-Micro for law firm management software (INT-09), and Beck Online for legal databases (INT-12). While users express occasional dissatisfaction and explore alternatives, the dominance of these major players, such as RA-Micro, can lead to a sense of vendor lock-in, as noted by INT-09, especially after implementing the Digitale Akte.

INT-12 says, there are "a few smaller legal databases", ^{Q-63} but other vendors are quite small and don't offer all the features that the big companies have.

- **IND-05 - Dynamic Nature of Legal Changes:** The legal field's dynamic nature, marked by a continuous influx of new laws and regulations, poses a significant challenge for legal practitioners (INT-06). This constant need to stay updated not only burdens legal professionals but also presents a challenge for legal tech applications, requiring consistent updates that demand substantial resources and time investment.
- **IND-06 - Restricted Control Over the Entire Process:** While we have already expressed the need to tackle entire processes in HUM-07, achieving this is complicated due to the involvement of multiple stakeholders. INT-04, a tax consultant, highlights the difficulty in exclusively using a digital platform like Unternehmen Online when suppliers and clients of clients also need to be considered: "Of course, you also have to include the suppliers of your customer, you have to include the customers of my client." (INT-04) ^{Q-64} Additionally, INT-08 mentions instances where notaries still send paper-based documents, emphasizing the lack of full control in the digitization process.
- **IND-07 - Time-Based Billing in Legal Practice:** In the legal field, invoicing is usually based on time, which means clients will pay a lawyer, based on how much time the lawyer spends with a client case. This means, "If they work more efficiently now, it won't help them that much." (INT-10) ^{Q-65} While efficient work may not immediately benefit practitioners in this billing model, there is potential for long-term effects on client selection based on efficiency. (INT-10)
- **IND-08 - Challenges in Liability Management:** Participants emphasize the importance of liability in the legal field, with challenges arising from the use of legal tech tools: "So basically, of course, you have to know [...] we lawyers and tax consultants are paid for our liability." (INT-03) ^{Q-66} The responsibility for outcomes is often unclear, as seen in cases involving the beA system. It is important to note, that with the beA "The crucial thing is that there is a fiction of service." (INT-03) ^{Q-67} This means, that documents and messages, sent via the beA, are considered legally received. INT-03 knows that this caused problems in the past, because the platform was not always 100% reliable, and documents were not received. This highlights the demand for very reliable software solutions in the field of law.

INT-13 also sees problems in the use of automatic document creation. He says, that by using those tools, the main question, who is responsible for the outcome, is not clarified. He says, that even if he is using good software, the outcome could be wrong or incomplete if he did not ask all relevant questions to the client.

INT-07, who is working in a legal tech start-up, sees this problem from the other, provider, perspective. He says, that they have limited or excluded their liability for their automatic tools, by adding corresponding paragraphs to their general terms and conditions. He furthermore explains, that they still offer manual consultation, but using the automatic tool is often financially motivated: "Of course, clients

automatically assume residual risks for which they could otherwise hold their advisor liable, but they only pay a fraction of the price." (INT-07) ^{Q-68}

- **IND-09 - Limited Understanding of Complex Legal Problems:** The need for a detailed understanding of legal problems is highlighted by INT-16, who describes the iterative development process due to the initial lack of clarity. They didn't know from the beginning, what the big picture was. Therefore, they iteratively started to develop their own solution: "And on the other hand, to be fair, we didn't really know what we actually needed, what we actually wanted, when we set off on this journey." (INT-16) ^{Q-69}

Additionally, the limited practical experience of some legal tech developers, as mentioned by INT-14, poses challenges in developing fitting solutions.

Operational and Technical Challenges

In this subsection, we will explore challenges, which can be grouped as operational and technical challenges, as presented in 5.6. Each challenge was assigned to an ID (TECH-xx, short for technical).

ID	Challenges
TECH-01	Inaccurate Results from Applications
TECH-02	Lack of Structured Data
TECH-03	Data Privacy Concerns
TECH-04	Cloud vs. On-Premise Dilemma
TECH-05	Challenges in Data Migration
TECH-06	Issues with Physical Verification Devices
TECH-07	System Connectivity Challenges
TECH-08	Diverse Nature of Case Data

Table 5.6.: Operational and Technical Challenges in Legal Tech Adoption

- **TECH-01 - Inaccurate Results from Applications:** One recurrent theme identified was the occurrence of inaccurate results generated by legal tech applications. As INT-10 emphasized, "If you are a good lawyer, you have to work precisely and with high quality," ^{Q-70} yet software of poor quality may produce errors. Notably, a tax consultant (INT-01) encountered a software glitch that failed to incorporate subtle variations in tax calculations between German federal states. Additionally, INT-14 highlighted a significant reliance on eDiscovery solutions in their company in the past, but the results lacked accuracy, which resulted "in necessary verification by a lawyer," ^{Q-71} thus diminishing overall benefits.
- **TECH-02 - Lack of Structured Data:** Access to data, particularly structured data, is essential for developing effective legal tech solutions. The deficiency of data,

especially in Germany compared to other countries, was highlighted by INT-15: "For example, only a very small percentage of court decisions are published and the pleadings of lawyers, for example, are not published at all. This is completely different in the US." ^{Q-72} This sentiment was echoed by INT-17, an academic researcher, who expressed frustration at the limitation of publicly available data.

The challenge is underscored by INT-06, who noted that legal tech lacks the extensive information resources available in the tax industry, emphasizing the importance of structured data for optimal technological functionality. "With legal tech, you have practically no information at the front that you can tap into," ^{Q-73} where he especially means system, where data is collected systematically with forms.

- **TECH-03 - Data Privacy Concerns:** Data privacy emerged as a critical concern affecting legal practitioners, as highlighted by INT-15. "As a lawyer, you have specific diversity obligations towards your clients, some of which are punishable by law. So, you already have a relatively high risk." (INT-15) ^{Q-74}

Data privacy concerns led to a temporary freeze in the implementation of the beA, as someone discovered, "that it is probably not one hundred percent certain after all." (INT-03) ^{Q-75}

- **TECH-04 - Cloud vs. On-Premise Dilemma:** The dilemma of choosing between cloud-based and on-premise solutions is pervasive for INT-15, "Because at least my understanding at the moment is that the legal situation is still very unclear." ^{Q-76} This dilemma is present in almost all participants. Many are hesitant to move applications into the cloud or use applications as a service, as they do not feel fully legally protected. In order to meet the unique legal industry requirements, such as "confidentiality and secrecy", (INT-02) ^{Q-77} applications need to run on their own servers in Germany.

As long as servers are in Germany, and not in the US, for example, INT-08 is confident to meet requirements, "we are in the process of switching to the cloud at the end of the year." (INT-08) ^{Q-78}

While we don't want to comment on the legal situation now, participants' answers show us, that this is a huge dilemma for the legal industry.

- **TECH-05 - Challenges in Data Migration:** Data migration challenges were noted, a concern not exclusive to the legal field but relevant to many participants. "As always, there were of course issues with data migration." (INT-08) ^{Q-79} He mentioned difficulties in migrating data while examining law firm management applications. Two out of three solutions faced serious issues in automatically transferring data to the new system.
- **TECH-06 - Issues with Physical Verification Devices:** Participants have complained about the need to carry physical verification devices with them, such

as cryptographic USB sticks (INT-01) or chip readers with chip cards (INT-09). Forgetting these devices hindered access to specific programs, "without the card I am helpless." (INT-09) ^{Q-80}

- **TECH-07 - System Connectivity Challenges:** Integrating legal tech tools into existing tool landscapes poses challenges, as INT-16 highlighted: "Whereby the main point is then mainly the interoperability with existing company systems." ^{Q-81} Interoperability with existing firm systems emerged as a crucial factor for effective legal tech solutions.
- **TECH-08 - Diverse Nature of Case Data:** The varied nature of case data poses challenges, as exemplified by an interviewee who preferred a paper/folder-based system over digital file systems. This preference stemmed from dealing with case data containing numerous non-digital and non-scanable medical pieces of evidence, such as x-ray images. (INT-11)

5.2.6. Success Factors in the Adoption Process

In this subsection, we are going to explore themes that emerged during the interviews, focusing on success stories in the adoption process. The aim is to explore generic patterns rather than delving into specific implementation projects.

- **Liability:** Addressing the liability concerns highlighted earlier, interviewees emphasized the effectiveness of dual systems involving both automatic processes and manual inspections: "We then only have to check whether it has been transferred correctly, is something still missing? And then one click." (INT-02) ^{Q-82} He highlighted the importance of retaining control over work, especially when documents are sent to external parties. This dual approach ensures qualitative work with increased efficiency.
- **Short- vs. Long-Term Perspective:** The adoption of new legal tech solutions requires a shift in perspective. INT-02 emphasized the need for a new way of thinking, acknowledging that initial investments in data capture are rewarded in the long run. This means, that the value chain has changed: "Now you actually invest a lot of work in the first phase, namely in data collection. And then afterward comes the reward." (INT-02) ^{Q-83} Communicating this shift to all involved is crucial, as it may initially appear as an increase in workload from a single-user perspective, e.g. in the collection of data at the beginning of a process, without the time-savings for colleagues in latter parts of a process in mind.
- **Impact of Small and Clearly Defined Tools:** It is not always huge legal tech solutions, which are needed. Often, small changes or tools can substantially impact and be sufficient (INT-07). He stresses the importance of clearly defining the problem and the goal solution: "It often holds us back in implementation

projects if we don't actually understand what problem is being solved at the beginning." (INT-14) ^{Q-84}

- **Proper (User Acceptance) Tests:** Despite legal tech experts finding tools intuitive and clear, users may struggle with the operational aspects. INT-14 advocated "regular review sessions with unbiased business users" ^{Q-85} to ensure usability, emphasizing the relevance of proper testing, a concept well-known in software engineering.
- **Becoming a Beta Tester:** Connected to the previous topic, one participant told us, that she has been recruited by DATEV as a Beta Tester: "I am also involved in pilot projects from time to time, where DATEV is trying out something new." ^{Q-86} This involvement allows users to contribute to the creation of useful tools or features, fostering a sense of collaboration, engagement, and ownership. (INT-01)
- **Centralization vs. Decentralization of IT:** The question of centralizing or decentralizing IT, especially in large organizations, emerged as a critical consideration. Both centralization and decentralization were presented as success stories.
Beginning with centralization, one interviewee told us, that they used to have local applications for every country for one use case, a resource management system for managing partners like law firms which they work with. This resulted in long and tedious communication efforts if one needed to have access to another country. They streamlined access across countries by centralizing these local tools into one global application, which can now be accessed by anyone (INT-16).
On the other hand, as law and tax topics are not internationally the same everywhere, decentralized approaches accommodated variations in legal and tax topics across regions: "Well, of course, we have our legislation here, so we have our own programs, i.e. DATEV, which Norway, for example, does not use." (INT-05) ^{Q-87}
From centralized systems, it has to be noted, that this results in a uniformly data format. This has been an important advantage, as it allows better, centralized analysis and *AI-readiness* (INT-14).
- **Application Platform:** In a previous success story, we have already explored, that small tools can have a big impact. In the interviews, it became noticeable, that especially large organizations, also developed small solutions themselves. Both, INT-16 and INT-14 state the importance of the underlying platform used: SharePoint, Microsoft Power Apps, and Power BI. INT-16 highlighted the agility and effectiveness of these platforms in rapidly developing and having the ability to show business users prototypes. Also, INT-14 stated, that the development platform and power apps are very good to develop ideas into applications in a very short amount of time.
- **Standardized Data Collection and Gradual Implementation of Use Cases:** Recognizing that not all use cases or documents are equally suitable for automation,

interviewees stressed the importance of standardized data collection. There are areas in law, where data can be collected in a standardized format, which forms the basis of many processes, so INT-13.

When they started with automating contract drafting, they looked first for contracts that are needed often, and are very similar. "So these are just standard documents, they are very standardized, the non-disclosure agreement." (INT-10) ^{Q-88} They have now successfully moved the creation of those documents to this new tool, while other documents, more complicated and not that standardized, are still created manually. A gradual implementation of use cases, as exemplified also by INT-02, proved effective in adapting to new processes. "Of course, we have now programmed the most common cases. And now, of course, there are x more, and we have to tackle them now. Step by step." (INT-02) ^{Q-89}

INT-04 shows another example, of how they managed to increase the share of letters sent digitally instead of physically by postal service. They introduced a digital print service called Digibase in their office. Digibase allows them in the firm, to send any sort of documents to a digital printing driver. The document is either sent digitally or printed at a central printing facility. (INT-04) The key aspect here is that this solution does not force users to use digital communication, but users have an option.

- **Communication and Exchange as Key Innovators:** Networking and regular meetings within professional communities were identified as key innovators. INT-04 highlighted the advantage of being part of such networks, which led to the successful implementation of Digibase through collaborative efforts. "I got to know it through the chimney sweep guild. [...] This is the knowledge of the swarm." (INT-04) ^{Q-90} He emphasizes the enormous advantage of being part of these networks and attending regular meetings. According to INT-04, engaging with people in these forums and exchanging information leads to new knowledge because "someone always knows that there is always something new." (INT-04) ^{Q-91} In this community, INT-04 not only implemented the tool Digibase after exposure to it at a meeting but also collaboratively decided to use this tool. They formed a committee, which addressed barriers hindering adoption. INT-04 explains, "We then took care of it in a small community group; we got a data protection officer to look into it." ^{Q-92} Additionally, the tool had to be adapted to fit their specific needs. INT-04 notes, "Of course, we then had various requests, which went as far as they were fulfilled." ^{Q-93}

The company behind the solution, Digibase, cooperated with the committee, providing a tailored solution, including implementing many change requests for free. The crucial aspect here is that it wasn't just one firm pushing for this change; the committee had the collective support of numerous firms. Therefore, it became a success story not only for the adopting firms but also for Digibase, acquiring many new customers now using their software.

In summary, the success factors in the adoption process involve strategic planning, clear use case identification, proper testing, platform selection for self-development, and maintaining human involvement in critical checks. There isn't necessarily one clear path to take, as we see that both, centralizing and decentralizing can be of success. The flexibility to centralize or decentralize IT, when appropriately aligned with organizational needs, and active participation in industry networks contribute significantly to the success of legal tech implementation projects.

5.2.7. Legal Tech and Digitization Responsibility

This section explores how interviewees manage the intersection of legal tech and general IT within their organizations. Specifically, it investigates whether organizations have dedicated personnel responsible for digital development or if they collaborate closely with external IT suppliers. The scope of work for in-house legal tech personnel and the tools they employ to manage IT and stay updated are also discussed.

For the analysis below, the focus is on practitioners, excluding start-up founders and academic researchers. Out of 14 interviewees, four work at large companies, all of which have a dedicated internal IT department (RES-01, short for responsibility group 1). Among the remaining 10, three have an internal person responsible for legal tech development (RES-02), four rely on an external IT provider (RES-03), and three neither have an internal responsible person nor an external IT provider (RES-04).²

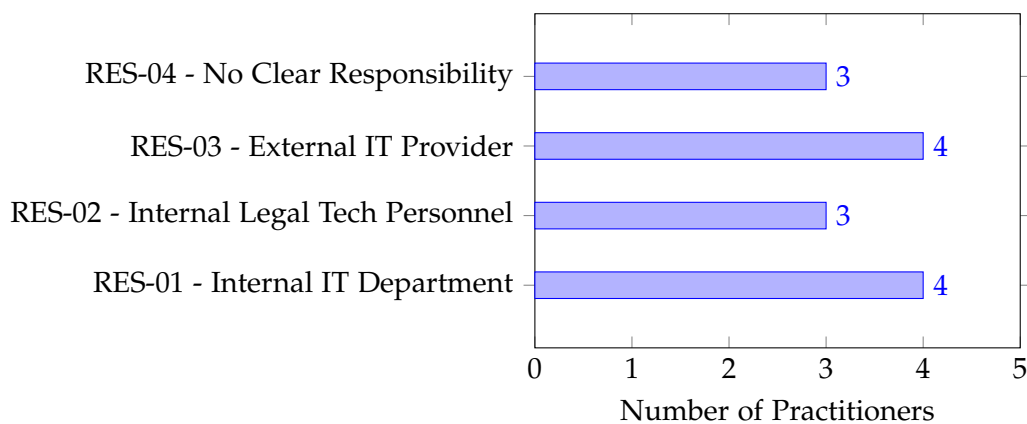


Figure 5.6.: Legal Tech Responsibility in Interviewees' Organizations

Figure 5.6 shows the distribution of participants in those four groups, which are now presented in more detail:

- **RES-01 - Internal IT Department:** In large companies with dedicated internal IT departments, the consensus is on the importance of having a specialized team. INT-14, responsible for legal tech, emphasizes the need for a dedicated team with

²Full classification can be found in the appendix in A.4.

expertise in legal tech. "This means that we have a certain amount of change management together with every tool launch." (INT-14) ^{Q-94} Their key to success is a dedicated team, who has a lot of expert knowledge in legal tech and represents the interface between legal business and IT. This team not only implements new tools but also handles operations, maintenance, and user training, "These are factors that are often forgotten." (INT-14) ^{Q-95}

INT-10, while not having a dedicated legal tech team, he highlights the role of knowledge managers within the law department, who "are advancing the expertise in our field." ^{Q-96} These managers drive legal tech development by managing the operation of those tools, conducting user training, and more.

INT-05, working in a company distributed internationally, emphasizes the role of local key users. These key users act as intermediaries between end-users and the IT department, ensuring smooth operations of legal tech solutions. She is one of the key users, which means, that she is the first contact person in case of any problems or questions from end-users in her region. (INT-05)

- **RES-02 - Internal Legal Tech Personnel:** In organizations with dedicated internal personnel for legal tech, three interviewees mention having individuals with legal tech responsibilities as additional administrative topics. INT-15, responsible for legal tech in a law firm, acquired the role because "I was simply interested in the topic, and then at some point, I just said I would like to do this." (INT-15) ^{Q-97} He is one of the few, who attended a legal tech fair: "I was in London in 2019 before Covid. There's the Legal Geek." (INT-15) ^{Q-98}

INT-12 discusses having an external IT company for bigger projects and an internal person responsible for legal tech topics: "[We have one person] who also looks around to see what's new, what can be done, what's good for us, what can we use." (INT-12) ^{Q-99} Information sources include newsletters from legal associations, such as Bundesrechtsanwaltskammer (translates: federal bar association) (BRAK), and active exchanges with colleagues.

- **RES-03 - External IT Provider:** Organizations relying on external IT providers delegate legal tech and IT management to external entities. INT-08 engages in meetings with colleagues for software exploration, but for implementation and IT management, "we have an external provider." (INT-08) ^{Q-100}

INT-02 switched to a larger IT provider for security reasons after detecting malicious software. The emphasis on IT security led to the decision to opt for a provider capable of handling their workload effectively, as the previous provider couldn't keep up with the workload.

- **RES-04 - No Clear Responsibility** In organizations without designated internal or external responsibility for legal tech, INT-03 and INT-11 highlight a lack of a dedicated IT person or provider actively developing legal tech. INT-03 expresses

interest in legal tech: "I once attended such an event organized by the notary association, [...] Just for the sake of interest," Q-101 while INT-11 mentions grappling with information overload from newsletters.

The distinctions between these groups shed light on varied approaches to legal tech and IT management within organizations. While larger companies often rely on dedicated internal IT departments, smaller entities may opt for internal personnel or external providers based on their specific needs and resources. The sources of information and the involvement of specialized teams or individuals highlight the diverse strategies organizations employ to navigate the intersection of legal tech and IT.

5.2.8. Legal Tech Development

In this section, we are going to explore, what future perspective participants have. We aim to explore whether they have specific digitization plans in mind or are awaiting new solutions to emerge in the market.

INT-02 believes that the legal tech landscape is not yet saturated. He identifies document analysis and knowledge management as areas that could benefit his firm. However, due to his age, he expresses reluctance to deal with the adoption of new systems at this stage of his career: "At my age, I'm not really worried about it now." (INT-02) Q-102

Quality requirements for applications are consistently high among participants. Before implementing significant new changes, they emphasize the need to first "digitize simple everyday law firm processes." (INT-03) Q-103 This sentiment aligns with INT-09's perspective, stating that their usage is already saturated, and their focus is on making applications more reliable, citing the example of the beA system that needs improvement.

While generative AI, particularly ChatGPT, has been adopted by only one participant, others are aware of the latest technology trends. They approach these trends with a mix of skepticism and anticipation. INT-15, for instance, says "I think what will be a very exciting topic, all these ChatGPT stories, and the resulting assistance systems." Q-104

INT-05 envisions structural changes for the future. She emphasizes that it's not only about implementing new systems but also about establishing new and efficient processes. According to her, there is a growing necessity to digitally represent more structured processes.

These insights showcase a diverse outlook on legal tech development, from our participants viewpoint, with considerations ranging from technological trends to the need for improved processes in the digital landscape. The cautious approach, especially in addressing the saturation of current applications and the desire for enhanced reliability, underscores the practical considerations and requirements that participants bring to their perspectives on the future of legal tech.

5.2.9. Academic Perspective

This section presents insights from an academic perspective on legal tech gathered through an interview with a German legal tech researcher (INT-17). We have presented the topics, problems, and strategy, which are relevant in practice at the moment. The academic viewpoint provides a distinct lens on the field, with INT-17 focusing on NLP, LLM, and neural networks.

The researcher characterizes his work as "foundational research", ^{Q-105} emphasizing the pursuit of knowledge in the academic context. He distinguishes between academic research and Research and development (R&D) conducted in companies. In academic research, there is greater flexibility to explore ideas without the immediate necessity of producing market-ready features: "In the academic context, many things are done to produce additional knowledge." (INT-17) ^{Q-106}

Access to data emerges as a significant challenge in academic research, with only a small portion of data being publicly available. Most data remains accessible only to legal practitioners, as they can access company-owned data, limiting the scope of academic investigations. (INT-17)

The development stream, as outlined by the academic researcher, flows from academic research to private R&D and, eventually, to law firms. In the private R&D stage, there is a dynamic knowledge transfer where "academic papers are read, and insights are exchanged." ^{Q-107} This transfer of knowledge, not only one way but in both directions is vital, as private firms can gain access to data, contributing to the iterative process of development and research. (INT-17)

This academic perspective sheds light on the distinctive role of foundational research in shaping future legal tech applications. The challenges of data access and the collaborative knowledge exchange between academia and private R&D underscore the interdependence of these spheres in advancing legal tech innovation.

6. Discussion

In this section, we will summarize the key findings of the interviews. Furthermore, we will explore our own thoughts on the patterns that surfaced from interviewees' understanding, challenges, and user stories. We will also explore the potential limitations of our research.

6.1. Key Findings

In the preceding sections, we presented our findings from the interviews with the participants. We began by showcasing participants' understanding of legal tech. We then explored the legal tech applications participants use and identified recurring patterns in the implementation process. This encompasses strategies, reasons for adopting legal tech, limitations, and success stories. Additionally, we investigated key drivers in law firms responsible for digitization and how they plan for future adoption.

Although all interviewees have occupations in the field of law, they vary significantly in terms of their jobs. We interviewed notaries, tax consultants, attorneys, academic legal tech researchers, and legal tech specialists. Even within the group of attorneys, differences emerged. For instance, one attorney specialized in medical cases with individual cases requiring various types of pieces of evidence, while another focused on employment law or contract law. It is imperative to note that deriving a single set of requirements for legal tech applications valid for all interviewees is not feasible. The disparity in their jobs and cases is not only content-related but is also reflected in their working approaches. One interviewee emphasized that legal tech start-ups often don't differentiate enough between different users, and problems and processes are not thoroughly thought about, resulting in legal tech applications that don't fully meet the needs of anyone. It became evident that a solid understanding of problems and the target audience is essential. While it might be tempting for start-ups to advertise a one-size-fits-all solution, the diverse requirements should not be underestimated.

Differences in legal tech adoption also become apparent depending on the size of companies. Significant gaps emerged when identifying who in a company is responsible for legal tech or digitization. Large organizations with ample resources can afford dedicated IT departments or specialized legal tech teams. In contrast, small companies often lack clear, defined responsibilities. It is not surprising that a small law firm, with five to 30 employees, is not in a position to have a dedicated digitization responsible team or person. In some cases, small firms had a legal tech responsible person, usually a regular lawyer with legal tech as an additional administrative role. This reflects the

strategic alignment of the firm and underscores the actual importance placed on the topic of legal tech. While small law firms could benefit from proper strategic IT and legal tech management, it would require substantial investments.

For law firms lacking resources, managing complex IT systems is a challenge. The easier the administration and operation of an IT system, the more applications firms can adopt. This brings us to the next topic: in the past, law firms used to run all applications themselves on their servers. In the interviews, we observed a gap between participants who still run everything on-premise and participants who are more open to cloud solutions. The software industry has shifted from selling software to various service-based models in recent years, allowing for a more demand-focused approach achieving higher functionality, flexibility, and decreased time-to-market. [Ben+00] When legal tech applications move not only to the cloud but become a service, law firms no longer worry about operation, where they might already lack resources. The biggest concern for law firms excluding Software as a service (SaaS) and the cloud is data protection and regulations, requirements that must not be neglected. While we cannot provide legal advice, research shows that many providers advertise legally conforming SaaS solutions for German law firms, such as Maja.Cloud¹. RA-Micro, the most used law firm management software in the interviewees' law firms, also offers running the software in the cloud. A solid legal foundation is needed to protect lawyers, and education is necessary to foster migration to SaaS solutions.

In larger organizations, it becomes clear that not only do their more immense resources affect the option to have dedicated IT/legal tech teams, but this also results in well-thought-out IT strategies, as presented earlier with the bottom-up and top-down approaches. These resources allow them to plan and act on a higher level, where adoption is not left to chance but is strategically sought. The definition of processes has the advantage of detailed calculations, such as how much time can actually be saved with a legal tech application, something that cannot happen on the same scale in smaller law firms. This also results in legal tech specialists working at big companies understanding that operating IT does not solely mean the initial provision of an application but requires additional tasks. These tasks include training employees and dealing with overall change. Later change requests are not uncommon and need to be implemented.

While initially introducing our definitions of legal tech, we explained that in the scope of this thesis, we will not differentiate between legal and tax tech in the interviews. However, it is crucial to acknowledge that tax consultants are generally more digital than other areas of law. Their ability to collect data in a standardized manner is critical to their success. Overall, as INT-17 explained, people do not submit their tax declarations in free form. Other areas of law rely more on diverse data and free text. While legal tech tools can also include many available applications for generating text or eDiscovery, also focusing on free text, this is only a short-term digitization, where traditional work processes are too strictly held onto. A proper digitization of the law industry wouldn't mean a transition of existing processes from paper to digital files but a digitization of the

¹<https://maja.cloud/anwaltssoftware-cloud/>

entire system in its entirety. INT-17 already had ideas on how the law system, beginning with legislation, has to change to understand the need for automated tools and provide legislation that can be directly understood by applications instead of manual translation from free text into algorithms. Thinking on this abstract level is not easy, and this complete digitization is not something we will see very soon, but his ideas can be a start for further development. Interviewees acknowledged the developments in this field, for example, with automated tools for end-users demanding compensation for flight delays, which are already very standardized, and data collected is in a standardized form.

The discussion of liability in automated systems is omnipresent: We introduced it in section 5.2.5 as a problem and explained one solution to it in 5.2.6. This topic is not new or exclusive to lawyers, as we see this also happening, e.g., with self-driving cars. As long as this is not entirely solved, people will hesitate to adopt systems where they need to put too much trust in them. In the short term, in our case, the legal sector, this can be solved by allowing humans to still supervise the processes and applications, even if it's just one click to confirm the correctness of an automated working result. In the long term, guidelines need to be created that allow people to really hand over responsibility to machines.

In the interviews, unfortunately, we didn't manage to talk to someone from the public sector, e.g., a judge. From the interviewees' perspective, all working in the private sector, the public sector lags in becoming digital. Still, interviewees recognized the public sector's efforts, e.g., by providing digital registers and fostering communication through the beA. The public administration, including courts, should increase their speed of digitization but still ensure the provision of extraordinarily qualitative software. Their efforts in digitizing themselves, including the system in its entirety, could play a pioneering role in improving the entire industry.

Although we don't want to do a complete comparison of the legal tech landscape in Germany with other countries, interviewees hinted at different development stages and possibilities between Germany and, for example, the US. Their legislation is more open to innovation, and more data is available. One problem from the start-up perspective is, of course, always the market size. While providing one legal tech solution in the US could reach 330 million people, the market size in Germany is only a fraction of that. In some cases, not only the whole of Germany could be reached with one legal tech solution, as Germany's federal structure also results in slight changes in legislation and rules between federal states. Standardization across (federal) borders in Germany and also in the EU could increase market sizes or at least make legal tech solutions work with only slight changes, facilitating and motivating start-ups to increase the pace in the development of legal tech applications.

When we began with the interviews, we hoped for more advanced legal tech applications to be presented as used by the interviewees. However, we discovered that especially smaller law firms are still in the beginning stages of adopting legal tech applications. We must acknowledge that the digitization process is gradual, where minor improvements can pave the way for more advanced solutions. In this context, one interviewee

mentioned the term *AI-readiness*, which includes various dimensions, including strategy, infrastructure, data, technology, ethics, and culture, getting prepared for more advanced solutions [Cor]. Although from a technical perspective, document management solutions may not be the most exciting and challenging applications, we have to acknowledge that those are necessary steps that allow for central data management, where ultimately more advanced AI solutions can work on. We need to understand that those advanced solutions cannot be integrated without the proper foundation, and as time proceeds, adoption will increase, and more advanced solutions can build on top of existing basics.

Our researcher's perspective (INT-17) gave us the opportunity to understand the gap between the academic and practical perspectives. While we cannot quantify this gap, nor can we compare this gap to other industries, we have to acknowledge its existence and width. In some cases, we saw advanced applications being used in practice; in others, significant skepticism of firms and employees led to low adoption. From studies of adoption models and theories, we also saw that this diversity in people's adoption is not uncommon and fits Roger's adoption lifecycle model.

6.2. Limitations

In our research, we conducted interviews with 17 individuals, and while these interviews provided valuable insights, a larger sample size could enhance the depth and diversity of our results. It is noteworthy that the representation of specific professions, such as only interviewing one notary, may limit the generalizability of our findings. Also, our sample included only a subset of professions, and specific roles like judges were not represented.

The gender distribution among our interviewees could be a limitation. It is crucial to acknowledge that this gender imbalance reflects a broader trend within the German law industry. Data from the BRAK reveals that approximately one-third of lawyers and merely 15% of attorney-notaries identify as female [Schb]. This industry-wide imbalance underscores a more significant systemic issue, and it is essential to recognize that our study's findings are situated within this broader context. Therefore, the observed gender ratio among our interviewees may not be a limitation of our specific research.

Due to the nature of our research, which relies on participants' willingness to engage, we prioritized personal connections of the first or second degree. However, this approach may introduce potential bias, as participants within a particular network may share common perspectives, forming a "bubble". The geographical focus of the researcher in Munich and the concentration of personal connections in the southern region may introduce localized bias, impacting the broader applicability of our findings.

Furthermore, the entire research process, from literature reviews to interviews and transcript analysis, was executed by a single researcher, introducing the possibility of researcher bias. Acknowledging this limitation is crucial for a nuanced interpretation of our findings.

In summary, our research is susceptible to sampling bias due to the limitations in

participant selection and the potential influence of the researcher's geographic and professional network. To validate and generalize our findings, future studies should adopt more robust sampling methods, include a more extensive and diverse participant pool, and involve multiple researchers in the analysis process.

7. Conclusion

This section aims to conclude the thesis by summarizing its content and providing an outlook for future research.

7.1. Summary

The primary objective of this thesis was to explore the legal tech landscape in Germany, focusing on its usage, challenges, and perspectives from both the practical and academic realms. Additionally, we sought to understand the success factors and barriers influencing the adoption of legal tech applications.

To address these objectives, we delved into legal tech's benefits and success factors, recognizing their varied and often specific nature to different use cases. Success stories emphasized the importance of a solid legal tech understanding within organizations, driving systematic change in a structured manner. This was particularly evident in the large differences between small and large organizations, as highlighted in section 5.2.7.

Barriers and challenges were presented in section 5.2.5, revealing that these obstacles can be user-related, organizational, market/industry-related, or of an operational and technical nature.

Examining the gap between academic and practical perspectives involved interviewing an academic researcher. While a gap was identified regarding relevant topics in both areas, we acknowledged that such gaps are not uncommon, as explained in Rogers' Technology Adoption Lifecycle. Stakeholders within the legal industry are not uniformly adopting legal tech at the same pace, as evidenced by their distinct challenges, limitations, and barriers.

7.2. Outlook

While our research successfully utilized SSIs to generate qualitative data to uncover patterns in benefits, success stories, challenges, and more, there is room for further investigation in this field.

- As highlighted throughout the thesis, due to the openness of our interview questions, we couldn't generate a quantitative examination of the subtopics. A follow-up quantitative study could explore the relevance of each topic with the help of structured questionnaires, providing insights into the significance of challenges, use cases, and benefits.

- In exploring the interviewees, we encountered the desire to compare the legal tech situation in Germany with other countries, such as the US or the UK, suggesting that these countries may have more advanced legal tech situations. Exploring the factors contributing to this innovation in other jurisdictions would be an interesting comparison for future research.
- While various methods and theories were employed to identify variables and questions guiding the examination of the current legal tech perspective, there is potential value in developing a framework to accurately measure technology adoption across the entire industry. Such a framework could facilitate continuous progress monitoring in the years to come.

A. General Addenda

A.1. Quotes and Translations

In the following, all direct quotes used in previous chapters are listed. As interviews were conducted in German, we will present the original quotes in German. Each quote used in prior chapters got assigned a quote ID (short Q-xxx). Those quote IDs will be used in the following table to present each quote's original version, adding context and ensuring a comprehensive understanding.

Q-ID	German Original Quote
Q-1	Sozusagen Automatisierung von Rechtsanwendung mit IT. (INT-02)
Q-2/ Q-39	dass ich in ganzheitlichen Prozessen denke (INT-04)
Q-3	Ich verstehe darunter, dass Rechtsdienstleistungen durch eine Technologie, zweifels durch eine künstliche Intelligenz ersetzt werden. Ersetzt oder ergänzt werden. (INT-10)
Q-4	Das ist schon gut beschreibt, aber nur einen wirklich kleinen Teil der gesamten Herausforderung, für die man eigentlich steht. (INT-16)
Q-5	sondern es muss ja verzahnt werden mit den rechtlichen Vorgaben, die die Tätigkeit an sich ordnet. (INT-17)
Q-6	Das heißt, da sitzen viele Leute an einem Dokument und wollen es gleichzeitig bearbeiten. (INT-15)
Q-7	Ich würde natürlich auch keine vertraulichen Mandanteninformationen da rein pflegen. (INT-12)
Q-8	Und dieses neue Programm ermöglicht das Ganze einmal einzugeben und dann immer wieder auf die Daten zuzugreifen. (INT-02)
Q-9	Also da gibt es dann schon eben elegante Features, wo man auch Post sogar schneller bearbeiten kann, als wenn man erst das Papier hat (INT-09)
Q-10	weil eben dann auch Sekretariat Zugriff hat auf diese Sachen. (INT-03)
Q-11	Wir sparen aber brutal viel Papier. (INT-04)
Q-12	Als moderner Arbeitgeber müssen sie Homeoffice anbieten können. (INT-02)
Q-13	Dass man da Mandanten, die vielleicht sich auch eine Einzelberatung niemals leisten könnten, bedient. (INT-07)
Q-14	also reduziert die Medienbrüche (INT-02)

- Q-15 Wenn ich einen Namen zehnmal reinschreiben muss, dann habe ich eine Chance, zehnmal den falsch zu schreiben. (INT-02)
- Q-16 das Programm zum Beispiel warnt oder spuckt bestimmte Hinweise aus, zum Beispiel, dass irgendwo eine Steuer entstehen könnte, die ich jetzt, die man auf den ersten Blick nicht sieht, (INT-03)
- Q-17 Da habe ich halt immer die aktuelle Fassung und ich habe auch die Möglichkeit zu sagen, ich hätte aber gerne das Gesetz vor 5 Jahren in dem Stand. (INT-09)
- Q-18 Wir haben eine Digitalisierungsstrategie, die im Wesentlichen aus zwei Komponenten besteht. (INT-14)
- Q-19 wie kann ich mit kleinen Applikationen dedizierte Inselprobleme lösen, die ein Jurist hat. (INT-14)
- Q-20 Und das ist im Wesentlichen auch ein wichtiger Punkt, das Thema Katalysatoren im Business (INT-14)
- Q-21 Man überschätzt die technische Lösung und unterschätzt letztlich diesen ganzen Bereich Change und Transformation. (INT-16)
- Q-22 Aber schon, dass man sich dann auch damit auseinandersetzt, wie bringe ich den Benutzer dazu, diese Lösung oder dieses System tagtäglich zu nutzen? (INT-16)
- Q-23 Also wir beschäftigen uns eher mit der übergeordneten Frage der digitalen Transformation (INT-16)
- Q-24 Es gibt bei uns entweder eine Directive oder Instruction, in der im Prinzip festgelegt wird, dass ein Prozess verfolgt werden muss. Die sind meistens auch nicht toolbasiert, sondern prozessbasiert. (INT-14)
- Q-25 Und zwar gibt es bei uns auf einer jährlichen Ebene im Prinzip Control Requirement Assessments. (INT-14)
- Q-26 Zum Teil habe ich das Gefühl, dass die Lösungen, die da am Markt entstehen, an den Bedürfnissen und an den Bedarfen der Rechtsabteilungen vorbei entwickelt werden. (INT-16)
- Q-27 Also das Leben ist meistens vielfältiger, als Softwareentwickler sich das vorstellen. (INT-02)
- Q-28 Es findet oft eine sehr unzureichende Differenzierung statt (INT-16)
- Q-29 dass wir halt einfach ein Problem haben in der Kanzlei oder sozusagen da in diesem Betriebsablauf, das stört uns, das wollen wir ändern. (INT-15)
- Q-30 Nein, es gab gar keine Make-or-Buy-Entscheidungen nach monetären Aspekten. Sondern es war wirklich funktional getrieben. (INT-16)
- Q-31 Und es wird immer auch eine soziale Komponente haben, weil der Mitarbeiter, der diese Zeit nicht verplempert, der hat weniger Stress, eindeutig. (INT-04)
- Q-32 die Urkunde reicht uns digital, wir wollen gar kein Papier mehr. (INT-02)
- Q-33 Und das Wesentliche ist halt der Faktor Mitarbeiter. (INT-02)

- Q-34 Und bei manchen funktioniert es nicht, weil es gibt halt Leute, die sagen, bei den wenigsten Kleinigkeiten, die erwarten, dass sowas wirklich völlig selbsterklärend ist. (INT-04)
- Q-35 Ich glaube eher, dass es wirklich im Wesentlichen daran liegt, dass das eine ist, es gibt nicht wirklich einen Eigenantrieb, denke ich, im Anwaltsbereich da jetzt aktiv zu entwickeln, (INT-12)
- Q-36 sie sind konservativ. (INT-10)
- Q-37 der Anwalt von seinem Wesen an sich jetzt eher automatisierungs-, standardisierungsfeindlich ist (INT-06)
- Q-38 Konnte ich hier nicht durchsetzen, weil der Widerstand gegen solche Geschichten in einem Unternehmen, (INT-13)
- Q-40 Das ist erstens nervig und zweitens, wie Sie sagen, das ist Verschwendung von Ressourcen. (INT-04)
- Q-41 Ich bin mit den traditionellen Literaturrecherche-Methoden auf Papier immer noch schneller. (INT-02)
- Q-42 Da ist jetzt auch viel Schrott, ehrlich gesagt, im Umlauf. (INT-08)
- Q-43 Ein bisschen, würde ich sagen. Aber jetzt richtig substanziell würde ich sagen nein. (INT-10)
- Q-44 Man hat mal damit beworben, dass das wie so eine Art Google-Suche ist, aber dem ist nicht so. (INT-05)
- Q-45 Und da wirklich durch einen Proof of Concept zu gehen mit den einzelnen Anbietern und zu sehen, was können sie tatsächlich, (INT-14)
- Q-46 Ein großes Problem (...) ist das Thema Overpromising. (INT-14)
- Q-47 Bei uns ist es auch so, dass unsere Beratung sich viel auf Verhandlungen bezieht, also wo es um Lösungen zu verhandeln geht mit der Gegenseite. (INT-12)
- Q-48 bei jeder neuen Idee draufzuspringen und zu sagen, okay, das teste ich jetzt, weil ich einfach nicht mehr die Zeit dazu habe. (INT-01)
- Q-49 Es war interessant, aber das finanzielle Invest, mit 70 Wohnungen und Gewerbeeinheiten, war zu hoch. (INT-13)
- Q-50 weil die Branche vermutlich durch den Einsatz von KI und Legal Tech eben mit einer gewissen gestiegenen Preisbewusstsein auf Seite der Mandanten konfrontiert ist. (INT-07)
- Q-51 wo du dann am Anfang auch nicht wirklich weißt, bringt mir das dann später was (INT-15)
- Q-52 Für eine Anwalts- und Steuerberatungskanzlei ist das natürlich kein ganz normales Unterfangen, (INT-07)
- Q-53 wo eine gewisse Zahlungsbereitschaft da ist (INT-07)
- Q-54 Deswegen sind es ja auch zum Beispiel die großen Kanzleien, die jetzt diese Vertragsgeneratoren und Analyse-Systeme, weil die halt auch das Geld in die Hand nehmen, um sowas für sich dann zu entwickeln, (INT-12)

- Q-55 Dann ist es aber in den Mandaten letztlich nicht dazu gekommen, dass diese Dokumentenmassen tatsächlich kamen. (INT-15)
- Q-56 Zum Schluss muss der Nutzer selber die Einsicht haben, okay, das Tool hilft mir weiter. (INT-14)
- Q-57 Und auch wichtig, zweiter Faktor, das Tool muss gleich am Anfang funktionieren und Mehrwert bringen. (INT-14)
- Q-58 Wir beauftragen externe Anwälte für diese Due Diligence und für Unterstützung. (INT-10)
- Q-59 Und zwar haben wir einen Service Hub für praktisch wie so ein LPO, so ein Legal Process Outsourcing Provider, (INT-14)
- Q-60 wo wir dann praktisch mit relativ wenig Kosten händisch oder manuelle Reviews ansteuern lassen können (INT-14)
- Q-61 Also wir haben ja dieses Bürokratieproblem. Das ist halt ein Riesenproblem. Das ist auch ein Standortnachteil. (INT-03)
- Q-62 Dokumente entstehen ja eigentlich quasi zu 99,99 Prozent alle irgendwo an einem Rechner. (...) am Ende wird es dann doch verschickt per Post und muss wieder eingescannt werden. (INT-04)
- Q-63 Es gibt ein paar kleinere juristische Datenbanken, die sind aber alle im Vergleich zu Beck-Online, also zum Beck-Verlag, kann man vergessen. (INT-12)
- Q-64 Du musst natürlich auch die Lieferanten von deinem Kunden miteinbeziehen, du musst die Kunden miteinbeziehen von meinem Mandanten. (INT-04)
- Q-65 Denn Anwälte, (...) die verkaufen ja ihre Zeit. Und wenn die jetzt rationeller arbeiten, bringt ihnen das erstmal nicht so viel. (INT-10)
- Q-66 also grundsätzlich muss man natürlich wissen, das ist meine Meinung dazu, wir Anwälte und auch Steuerberater werden für unsere Haftung bezahlt. (INT-03)
- Q-67 Und das Entscheidende, das ganz Entscheidende daran ist, dass es eben eine Zustellungsfiktion gibt. (INT-03)
- Q-68 Die Mandanten gehen natürlich automatisch Restrisiken ein, für die sie sonst ihren Berater haften lassen könnten, aber dafür zahlen sie dann halt auch nur einen Bruchteil. (INT-07)
- Q-69 Und auf der anderen Seite wussten wir auch, muss man auch fairerweise sagen, als wir diese Reise antraten, gar nicht so recht, was wir da eigentlich brauchen, was wir da eigentlich wollen. (INT-16)
- Q-70 Also ich glaube, wenn du ein guter Jurist bist, musst du präziser arbeiten und mit hoher Qualität, sonst bringt das überhaupt nichts. (INT-10)
- Q-71 es wurden immer Vorschläge gemacht, die dann durch den Juristen nochmal verifiziert werden mussten. (INT-14)

- Q-72 Also es wird zum Beispiel nur ein sehr geringer Prozentsatz von Gerichtsentscheidungen veröffentlicht und auch die Schriftsätze von den Anwälten zum Beispiel werden gar nicht veröffentlicht. Das ist in den USA komplett anders. (INT-15)
- Q-73 weil du hast ja beim Legal Tech hast du ja vorne praktisch keine Informationsmöglichkeit, die du anzapfen kannst. (INT-06)
- Q-74 also du bist natürlich als Anwalt, hast du spezifisch gegenüber deinen Mandanten Verschiedenheitsverpflichtungen und die sind auch teilweise strafbewehrt. (INT-15)
- Q-75 Plötzlich meldete sich irgendjemand und meinte, das sei wohl doch nicht hundertprozentig sicher. (INT-03)
- Q-76 Weil zumindest mein Verständnis im Moment noch so ist, dass es einfach die Rechtslage da sehr unklar ist. (INT-15)
- Q-77 Verschwiegenheitspflicht, Geheimnisschutz. (INT-02)
- Q-78 aber wir werden jetzt auch demnächst vollständig in die Cloud wechseln. (INT-08)
- Q-79 Bei der Datenmigration gab es natürlich wie immer Themen (INT-08)
- Q-80 Oder wenn ich die Karte nicht habe, ohne die Karte bin ich sonst hilflos. (INT-09)
- Q-81 Wobei der Hauptpunkt ist dann hauptsächlich die Interoperabilität mit bestehenden [Unternehmens]-Systemen (INT-16)
- Q-82 Wir müssen dann eigentlich nur noch schauen, ist es richtig übernommen worden, fehlt noch was? Und dann Mausclick. (INT-02)
- Q-83 Jetzt investiert man sehr viel Arbeit eigentlich in die erste Phase, nämlich in die Datenerfassung. Und hinterher dann kommt die Belohnung. (INT-02)
- Q-84 und es hält uns in Implementierungsprojekten oft auf, wenn man am Anfang nicht tatsächlich erfasst, welches Problem gelöst wird, (INT-14)
- Q-85 dass wir auf der einen Seite mit unvoreingenommenen Business-Nutzern Review-Sessions haben. (INT-14)
- Q-86 Ich bin auch ab und zu immer mal wieder in irgendwelchen Pilotprojekten dabei, wo DATEV irgendwas Neues ausprobiert (INT-01)
- Q-87 Also, wir haben natürlich hier unsere Gesetzgebung, also wir haben ja eigene Programme, also DATEV, das benutzt jetzt Norwegen zum Beispiel nicht. (INT-05)
- Q-88 Also das sind halt Standarddokumente, die sind sehr stark standardisiert, die Geheimhaltungsvereinbarung. (INT-10)
- Q-89 Wir haben natürlich jetzt erst mal die häufigsten Fälle programmiert. Und jetzt gibt es natürlich noch x weitere, und da müssen wir jetzt rangehen. Schritt für Schritt. (INT-02)
- Q-90 Ja, ich habe es über die Kaminkehrer-Innung kennengelernt. (...) Das ist das Wissen des Schwarmes. (INT-04)

- Q-91 wenn man sich in so Netzwerken bewegt, dass immer irgendeiner weiß, da ist immer was Neues. (INT-04)
- Q-92 Das haben wir dann in so einer kleinen Gemeinschaftsgruppe sich darum gekümmert, haben uns einen Datenschützer darauf angesehen und so, okay, es ist alles okay. (INT-04)
- Q-93 Andere Kollegen haben es dann auch genutzt und wir haben dann natürlich diverse Wünsche gehabt, die sind dann soweit gegangen, wie es auch erfüllt worden ist. (INT-04)
- Q-94 Das bedeutet, wir haben dann zusammen mit jeder Tooleinführung ein gewisses Change Management. (INT-14)
- Q-95 Das sind oft Faktoren, die vergessen werden. (INT-14)
- Q-96 Also das sind welche, die in unserem Fachgebiet das Fachwissen weiter treiben. (INT-10)
- Q-97 dass ich einfach Interesse an dem Thema habe und dann irgendwann einfach gesagt habe, hey, ich würde das hier gerne machen. (INT-15)
- Q-98 Da war ich 2019 vor Corona in London. Da gibt es die Legal Geek. (INT-15)
- Q-99 es gibt bei uns eine Person, die sich schwerpunktmäßig darum kümmert und die da auch sehr, ja die sich schon auch umguckt, was tut sich Neues, was kann man machen, was ist gut für uns, was können wir gebrauchen und dann auch das entsprechend in die Kanzlei gibt oder auch einführt. (INT-12)
- Q-100 Wir haben einen Dienstleister. (INT-08)
- Q-101 Ich habe mal so eine Veranstaltung besucht von der Notarvereinigung, (...) Einfach mal so interessehalber. (INT-03)
- Q-102 Also ich mache mir jetzt in meinem Alter offenstanden keine Gedanken dazu. (INT-02)
- Q-103 einfache tagtägliche Kanzlei Prozesse einfach digitalisiert (INT-03)
- Q-104 Also ich glaube, was ein sehr spannendes Thema sein wird, wird diese ganzen Chat-GPT-Geschichten und die darauf resultierenden Assistenzsysteme. (INT-15)
- Q-105 also man könnte es Grundlagenforschung nennen. (INT-17)
- Q-106 Also im Gegensatz zu jetzt im akademischen Kontext, wo man viele Dinge halt eben um das Erkenntnismehrwerts tut. (INT-17)
- Q-107 meines Erachtens nach existiert die Pipeline von Forschung zu Produktentwicklung. Also, es ist mein Eindruck, dass da Paper gelesen werden und ein Wissenstransfer stattfindet. (INT-17)
-

A.2. Translation of Interview Guideline in English

In the following, possible **interview questions** are presented. This is a rough questionnaire meant for **orientation**. Not all questions need to be asked; additional questions may be posed as needed.

Introductory Questions

- What is your current **profession**?
- How many years of professional experience do you have in this field?
- What is the size of the **organization** where you work? (Approximate number of employees)
- For which tasks that you perform manually on a regular basis do you **wish** for a Legal Tech solution?

Understanding Legal Tech

- What do you understand by the term Legal Tech?

Usage of Legal Tech

- Do you use **Legal Tech software** in your **daily work**? Which ones and for what purposes? (How was the introduction, who decided? Involved parties? Positive/Negative impacts? Utility compared to the previous solution? What is the effort involved in implementing this tool?)
- **Success Stories:** Which Legal Tech products have you successfully introduced, and what contributed to their success? Were there difficulties that had to be overcome?
- **Failures:** With which Legal Tech products did you encounter **difficulties**, and what were they? How can these be avoided in the future?
- Are you aware of other **specific products** that you do **not use**? Why do you not use them?
- Have you had experience with **in-house developments** of Legal Tech software? Why did you choose in-house development?
- How do **external factors** (changes in laws, client expectations, competition) influence the use of technology in your organization?

(For Researchers Only:) Legal Tech Research

- What topics are currently relevant in **Legal Tech research**?
- How advanced do you see the **implementation** of your research/results in practice?
- How do you view the **cooperation** between the academic world and practice? What recommendations or wishes do you have for the future?

Development of Legal Tech

- Has your use of Legal Tech software changed in the **last few years**? If yes, how?
- What creates **innovation** in your organization? (People, mechanisms, sources of information)
- According to your experience, what **factors support** the introduction of new Legal Tech software, and what hinders them?
- How do you assess the **future development** in the Legal Tech field? (Trends, new technologies, concerns, wishes, ideas) Where do you see your organization in terms of Legal Tech in 5 to 10 years?

Closing Questions

- Is there an interesting topic you would like to discuss that we haven't covered yet?
- May we contact you again in the future?
- Do you know colleagues who might also be suitable for an interview?
- Thank you very much for your participation.

A.3. Original Interview Guideline in German

Im Folgenden werden mögliche **Interview Fragen** dargestellt. Dabei handelt es sich um einen groben Fragenkatalog, der zur **Orientierung** dienen soll. Es werden nicht zwangsläufig alle Fragen gestellt, gegebenenfalls werden auch weitere Fragen gestellt.

Einführungsfragen

- Welchen **Beruf** üben Sie derzeit aus?
- Wie viele Jahre **Berufserfahrung** haben Sie in diesem Bereich?
- Welche Größe besitzt die **Organisation**, bei welcher Sie arbeiten? (Ungefähre Mitarbeiteranzahl)

- Für welche **Aufgaben**, die Sie ständig manuell ausführen müssen, **wünschen** Sie sich eine Legal Tech Lösung?

Verständnis von Legal Tech

- Was verstehen Sie unter dem Begriff Legal Tech?

Nutzung von Legal Tech

- Benutzen Sie **Legal Tech Software** in Ihrem **Arbeits-Alltag**? Welche, wozu? (Wie kam es zur Einführung, wer hat entschieden? Beteiligte? Positive / Negative Auswirkungen? Nützlichkeit im Vergleich zur vorherigen Lösung? Wie hoch ist der Aufwand der Einführung dieses Tools?)
- **Success Storys**: Welche Legal Tech Produkte konnten Sie erfolgreich einführen, und was hat zum Erfolg beigetragen? Gab es Schwierigkeiten, die überwunden werden mussten?
- **Failures**: Bei welchen Legal Tech Produkten gab es **Schwierigkeiten**, und welche waren diese? Wie können diese in Zukunft vermieden werden?
- Kennen Sie weitere **konkrete Produkte**, welche Sie jedoch **nicht verwenden**? Warum verwenden Sie sie nicht?
- Haben Sie bereits Erfahrungen mit **Eigenentwicklungen** von Legal Tech Software machen können? Warum haben Sie sich für eine Eigenentwicklung entschieden?
- Wie **beeinflussen externe Faktoren** (Gesetzesänderungen, Erwartungen von Mandanten, Wettbewerb) die Nutzung von Technologie in Ihrer Organisation?

(Nur für Forschende:) Legal Tech Forschung

- Welche Themen sind aktuell in der **Legal Tech Forschung** relevant?
- Wie weit sehen Sie die **Umsetzung** Ihrer Forschung / Forschungsergebnisse in der Praxis fortgeschritten?
- Wie sehen Sie die **Kooperation** zwischen der akademischen Welt und der Praxis? Welche Empfehlung oder Wünsche haben Sie für die Zukunft?

Entwicklung von Legal Tech

- Hat sich Ihre Nutzung von Legal Tech Software in den letzten Jahren geändert? Wenn ja, wie?
- Wodurch entsteht in Ihrer Organisation **Innovation**? (Personen, Mechanismen, Informationsquellen)

- Welche **Faktoren unterstützen**, Ihrer Erfahrung nach, die Einführung neuer Legal Tech Software, und welche hindern sie?
- Wie schätzen Sie die **weitere Entwicklung** im Bereich Legal Tech ein? (Trends, Neue Technologien, Sorgen, Wünsche, Ideen) Wo sehen Sie Ihre Organisation bzgl. Legal Tech in 5 bis 10 Jahren?

Schlussfragen

- Gibt es noch ein interessantes Thema, über welches Sie sprechen möchten und wir noch nicht behandelt haben?
- Dürfen wir Sie in der Zukunft erneut kontaktieren?
- Kennen Sie Kollegen, die ebenfalls für ein Interview in Frage kommen könnten?
- Vielen Dank für Ihre Teilnahme.

A.4. Interview Participants' Data

In table A.2, the complete interviewee data is presented. Their ID, Occupation, Experience in years, Organization Size in Employees, Gender, Duration of the Interview, our Classification of their Legal Tech Understanding, and in terms of Legal Tech Responsibility are presented.

ID	Occupation	Exp.	Org. Size	Gender	Duration	Underst.	Responsibility
INT-01	Tax Consultant	25	1-9	Female	62	2.0	External IT Provider
INT-02	Notary	40	10-24	Male	44	2.0	External IT Provider
INT-03	Attorney	15	1-9	Male	51	3.0	No Responsibility
INT-04	Tax Consultant	50	10-14	Male	70	1.0	External IT Provider
INT-05	Tax Consultant	20	100K+	Female	44	2.0	Internal IT Department
INT-06	Attorney (Start-Up)	25	25-50	Male	40	2.0	Not applicable
INT-07	Tax Consultant (Start-Up)	15	1-9	Male	71	3.0	Not applicable
INT-08	Attorney	15	10-24	Male	33	1.0	External IT Provider
INT-09	Attorney	25	10-24	Male	38	3.0	Internal Legal Tech Person
INT-10	Attorney	40	100K+	Male	69	3.0	Internal IT Department
INT-11	Attorney	25	10-24	Male	95	Other	No Responsibility
INT-12	Attorney	20	10-24	Male	39	1.0	Internal Legal Tech Person
INT-13	Attorney	30	500-1,000	Male	37	2.0	No Responsibility
INT-14	Legal Tech Specialist	10	10K-100k	Male	61	1.0	Internal IT Department
INT-15	Attorney	5	25-50	Male	50	3.0	Internal Legal Tech Person
INT-16	Legal Tech Specialist	10	100K+	Male	39	Other	Internal IT Department
INT-17	Academic Researcher	10	10K-100K	Male	54	3.0	Not applicable

Table A.2.: Aggregated Interviewee Data

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Glossary

Beck Online Beck Online is an electronic legal database offering a comprehensive collection of legal information and resources. Developed by C.H. Beck, a leading German publishing house, Beck Online provides access to legal texts, commentaries, journals, and other legal materials. It serves as a valuable tool for legal professionals, scholars, and practitioners, offering a centralized platform for legal research and staying updated on current legal developments.. 19, 32

ChatGPT ChatGPT is an advanced language model developed by OpenAI. It is specifically designed for natural language understanding and generation, making it adept at engaging in conversational contexts.. 20, 41

DATEV DATEV is a software and IT service provider specializing in solutions for tax consultants, accountants, and other professionals in the field of taxation and accounting. The company offers a range of software tools and services to support financial processes, including accounting, payroll, and tax declaration.. 18, 19, 24, 32, 37

Digibase DigiBase is a specialized digital communication tool designed to facilitate secure and efficient interactions between notaries and their clients. Initially developed for chimney sweepers, DigiBase has been modified to meet the needs of notaries. This tool empowers notaries to transmit important documents digitally, offering a more convenient and environmentally friendly alternative to traditional mail.. 20, 23, 30, 31, 38

Digitale Akte Within the law firm management software, specifically in the context of RA-Micro, the "Digitale Akte" (also "E-Akte") is a subproduct that denotes the digital case file management feature. This functionality is integrated into the broader suite of tools provided by RA-Micro to support law firms in their administrative and legal practices. The Digitale Akte within RA-Micro facilitates the electronic organization, storage, and retrieval of case-specific documents and information. It is designed to enhance the efficiency of legal professionals by offering a centralized and digital repository for all relevant case materials.. 20, 22, 23, 32

Lawlift Lawlift is a legal technology tool focused on automating the process of contract drafting. This innovative solution guides users through a user-friendly form, systematically collecting relevant data. The standout feature of Lawlift lies in its

capability to automatically generate complex contracts based on the information provided within the platform.. 21

Legal Geek Legal Geek is a community and platform located in the United Kingdom at the intersection of law and technology, dedicated to fostering innovation and collaboration within the legal industry. It serves as a hub for legal professionals, entrepreneurs, and technologists to connect, share ideas, and stay informed about the latest advancements in legal technology.. 40

RA-Micro RA-Micro is a comprehensive law firm management software designed to streamline various aspects of legal practice and administration. Tailored to the needs of law firms and legal professionals, RA-Micro offers a range of features to enhance efficiency and organization within a legal practice. Key functionalities of RA-Micro include case management, document management, time tracking, billing, and accounting. The software is crafted to support legal professionals in managing their caseloads, maintaining organized digital files, and handling administrative tasks associated with legal work. See also "Digitale Akte".. 20, 32, 44

RQ1 How can the adoption of legal tech in academia and practice be effectively measured in terms of usage and impact?. 5, 6, 13

RQ2 What is the current state of legal tech in practice, and what are the prevailing challenges and limitations compared to the current state of legal tech in academia?. 5

RQ3 Which reasons or success factors influence the adoption rate of legal tech in practice, and how can barriers hindering adoption be addressed?. 5

Steuersoft Steuersoft refers to a tax software designed to assist individuals and businesses in managing their tax-related activities. This software typically includes features for tax calculation, preparation, and filing.. 18

Unternehmen Online Unternehmen Online is a digital platform provided by DATEV, facilitating online collaboration between businesses and their tax consultants. This platform allows secure and efficient exchange of financial data, documents, and information, promoting a streamlined workflow for accounting and tax-related tasks. Unternehmen Online plays a pivotal role in enhancing communication and data-sharing between businesses and their financial advisors, contributing to a more effective and digitized approach to financial management.. 18, 33

Acronyms

- AI** artificial intelligence. vii, 1, 2, 20, 30, 41, 46
- API** application programming interface. 21, 24
- beA** besonderes elektronisches Anwaltspostfach (translates: special electronic mailbox for lawyers). 20, 33, 35, 41, 45
- BRAK** Bundesrechtsanwaltskammer (translates: federal bar association). 40, 46
- DMS** document management system. 19
- IT** information technology. 14, 17, 24, 27, 37, 39–41, 43, 44
- LLM** large language model. 2, 42
- ML** machine learning. vii, 1
- NLawP** Natural Language Processing and Legal Tech. 2
- NLP** natural language processing. vii, 1, 2, 42
- R&D** research and development. 42
- RQ** research question. 2, 5, 6, 13
- SaaS** software as a service. 44
- SEBIS** Software Engineering for Business Information Systems. v, 1
- SSI** semi-structured interview. 2, 5–8, 13, 16, 49
- TAM** Technology Acceptance Model. 13–16
- TUM** Technical University of Munich. 1
- UTAUT** Unified Theory of Acceptance and Use of Technology. 15, 16, 63

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