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TOPIC:

Artificial Intelligence in Judicial Decision-Making in Jordan: A Needs-Based Assessment of Potential Uses, Risks, and Governance

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Supervisors:

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Supervisor's Recommendation

On the PhD Dissertation of Ammar Alqatawna

Entitled

Artificial Intelligence in Judicial Decision-Making in Jordan: A Needs-Based Assessment of Potential Uses, Risks, and Governance

Dr. Adrienn Nagy, Doctoral Supervisor, University of Miskolc

As one of the supervisors of Ammar Alqatawna's doctoral research, I am pleased to provide this recommendation concerning his dissertation and academic performance. The dissertation addresses an important and timely issue: the potential use of artificial intelligence in judicial decision-making in Jordan while preserving the fundamental responsibilities of judges and the requirements of fair proceedings.

The research is distinguished by its needs-based and function-specific approach. Rather than assuming that technological solutions should be adopted, it first examines challenges affecting judicial workload and the quality of judicial work. It then evaluates the potential contribution of AI to case-file review, legal research, preliminary judgment drafting, and the examination of expert evidence. In doing so, the dissertation clearly distinguishes between supporting judges and transferring judicial judgment or responsibility to automated systems.

Methodologically, the dissertation combines legal and documentary analysis with qualitative research based on semi-structured interviews with eighteen Jordanian judges. It also draws on relevant international experience while considering the particular legal and institutional context of the Jordanian judiciary. The candidate acknowledges the limitations of the empirical sample and the absence of direct testing of AI systems on Jordanian case files, maintaining a careful distinction between potential benefits and demonstrated outcomes.

An important contribution of the dissertation lies in its assessment of the legal and institutional conditions necessary for the responsible consideration of specific AI applications. Particular attention is given to judicial independence, procedural fairness, transparency, accountability, accuracy, data governance, and meaningful human oversight. The research also recognises the

continued importance of conventional institutional reforms and proposes a cautious, phased approach to evaluating potential AI applications.

Throughout his doctoral studies, Ammar has demonstrated dedication to his research and a constructive willingness to engage with academic feedback and improve his work. His professional experience in the Jordanian judiciary provides a valuable practical perspective, which he has incorporated into a systematic legal and empirical research framework.

Assessment of Publication Performance

The candidate has demonstrated sustained academic engagement through his publication activities. His research record includes three published journal articles and three additional articles accepted for publication, comprising both single-authored and co-authored contributions. Having collaborated with Ammar on two of these articles, I have also had the opportunity to observe his engagement with academic research and scholarly discussion directly. These publications are closely related to the dissertation and address different aspects of artificial intelligence in judicial decision-making, including its potential applications, implementation challenges, risks, and governance. Overall, his publication record reflects consistent research efforts and a meaningful contribution to academic discussion in this developing field.

Taken together, the dissertation and related publications demonstrate the candidate's ability to address an important legal research problem and contribute to academic discussion in the field. In view of the research topic, methodology, scholarly contribution, and publication performance, **I support the submission of the dissertation for the University's doctoral review and defence procedures**, subject to the applicable academic requirements.

Dr. Adrienn Nagy, Doctoral Supervisor, Faculty of Law, University of Miskolc

Signature: 

Date: 25. 10. 2026

SUPERVISOR'S RECOMMENDATION

Ammar Alqatawna

on the doctoral dissertation entitled

Artificial Intelligence in Judicial Decision-Making in Jordan: A Needs-Based Assessment of Potential Uses, Risks, and Governance

Zsolt Czékmann

I have followed Ammar Alqatawna's work since the beginning of his doctoral studies at the Deák Ferenc Doctoral School in Law and Political Sciences at the University of Miskolc, where I have supervised his research with my co-supervisor, Dr Adrienn Nagy. Our cooperation has extended beyond supervision, as we have conducted joint research and published together, most recently in the *Law and Development Review*, with further joint articles forthcoming in the *Arab Law Quarterly* and the *AAU Journal of Business and Law*. I have known the Candidate's work from his first publications to the dissertation now submitted, and I have witnessed the process through which it took shape. On this basis, I state at the outset that this dissertation is the result of the Candidate's own, independent work. The Candidate has also disclosed transparently, in a signed statement, the limited supporting tasks for which AI tools were used, while retaining full responsibility for the analysis and conclusions.

The dissertation addresses one of the most pressing questions facing contemporary justice systems: whether, where and under what conditions artificial intelligence may legitimately support judicial decision-making. The topic is both timely and demanding: it lies at the intersection of constitutional and procedural law, judicial administration and technology, in a jurisdiction on which the scholarly literature is scarce. As a serving member of the Jordanian judiciary, the Candidate combines first-hand knowledge of judicial practice with the critical distance that academic research requires. The task is worthy of a doctoral dissertation — and, in my view, so is the way in which it has been accomplished.

Ammar Alqatawna has demonstrated excellent research abilities throughout his doctoral studies. He connects legal analysis with empirical evidence and reaches balanced conclusions that neither overstate the promise of technology nor dismiss it. I would particularly highlight his openness to criticism: in the final stages, he revised the dissertation substantially in response

to detailed comments, strengthening its methodology and articulating its contributions more precisely — in my experience, one of the surest signs of a researcher's maturity.

Beyond its scholarly contribution, the dissertation offers concrete guidance to the Jordanian Judicial Council, the Ministry of Justice and the Judicial Institute on assessing proposed applications, controlled testing, the protection of judicial data and the preservation of judicial independence. Its framework is also relevant to other jurisdictions, particularly in the Arab region, facing similar challenges.

I am convinced that the Candidate has chosen an appropriate path and method to achieve his stated objectives. The dissertation meets the formal requirements set for doctoral dissertations. The Candidate commands an extensive body of literature — some 285 sources and 557 footnotes, combining Jordanian primary legal sources, official reports, international guidance and the academic literature — and his references are careful and accurate. The results have also been published, including in the *Comparative Law Review* and the *Law and Development Review*, with further articles accepted for publication.

Overall, I find that Ammar Alqatawna's doctoral dissertation is a high-quality piece of scientific work, in which the Candidate has conducted a valuable investigation in a distinctly individual manner and produced new scientific results. By writing this dissertation, the Candidate has demonstrated his suitability for independent scientific work. I therefore recommend that the dissertation be submitted to the internal (workplace) debate and, following it, to the public defence.

Miskolc-Egyetemváros, 30 October 2026

Zsolt Czékmann
scientific supervisor

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Above all, I praise and thank Almighty God, the source of all grace and blessings. He alone is sufficient for me; every blessing and every good thing in my life comes from Him, and whatever good I have missed remains in His hands. He is the Most Generous, the Most Compassionate, the Most Merciful, the All-Encompassing, and the All-Knowing, who governs all affairs. By His grace and guidance, I have been able to complete this work.

My heartfelt gratitude goes to my beloved parents for their endless love, prayers, and unwavering support, and to my beloved wife for her patience, understanding, and encouragement throughout my doctoral studies.

I am deeply grateful to my supervisors, Dr. Zsolt and Dr. Adrienn, for their invaluable guidance, dedication, and continuous support. Their exceptional generosity with their knowledge and time, together with their constant encouragement, has meant a great deal to me throughout this academic journey.

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My sincere thanks also go to all my professors, the staff of the University of Miskolc, and my dear colleagues for their kindness and for making this journey both rewarding and memorable.

I am equally grateful to my beloved country, Jordan, and to the Jordanian Judicial Council, the institution to which I am proud to belong, for enabling me to pursue my doctoral studies.

Finally, I express my sincere gratitude to Hungary, the Hungarian Government, and the Tempus Public Foundation for the opportunity to pursue my doctoral studies through the Stipendium Hungaricum Scholarship Programme.

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List of Abbreviations

ADR Alternative Dispute Resolution

AI Artificial Intelligence

CCJE Consultative Council of European Judges

CEPEJ European Commission for the Efficiency of Justice

EU European Union

JJC Jordanian Judicial Council

LLM Large Language Model

ML Machine Learning

NLP Natural Language Processing

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1. Introduction

This chapter introduces the study and establishes the context in which the study is situated. It outlines the research problems, aim and objectives, research questions, methodology, scope and limitations, and the originality and significance of the study. It concludes by presenting the structure of the dissertation.

1.1 Background and Context

Over recent decades, judicial systems have increasingly expanded their use of technology in the administration of court work. Jordan has not been separated from this development. Jordanian courts have gradually moved from extensive reliance on paper-based records and procedures towards a digital environment that supports the electronic management of cases.[1] This transition has contributed to modernising the environment in which judicial work is performed and to expanding the range of tools available to courts and judges.

Nevertheless, much of this digital development has remained concentrated on the management of judicial work and the information surrounding it, rather than extending directly into the substantive content of judicial decision-making.[2] Conventional digital systems assist in storing, organising, retrieving, and managing information and procedures, but they do not ordinarily engage with judicial materials in a manner that approaches the intellectual processes involved in examining a case and forming a judicial decision. This may be partly related to the nature of the technological capabilities available during earlier stages of digitalisation, which made court technology more suited to these types of functions.

Contemporary artificial intelligence (AI) systems, however, are no longer limited to storing or transmitting information. They are capable of analysing large volumes of text, extracting and organising information, producing summaries, assisting with research, generating written material, and performing other related functions.[3] These capabilities bring technology closer than before to certain activities associated with judicial decision-making itself. Yet this closer proximity to substantive judicial work also makes the issue more sensitive. Although technologies used in courts before AI were not free from legal or institutional implications,

[1] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022, p. 59; Ministry of Justice (Jordan) n.d., 'حوسبة أعمال المحاكم'.
[2] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022, pp. 59, 121.
[3] Gutiérrez 2024, pp. 7–9.

those implications were generally less connected with the substantive content of judicial decision-making because such technologies remained largely focused on administrative, procedural, and information-management functions. Contemporary AI systems, by contrast, may perform tasks related to the substantive work of judges and may therefore interact more directly with legal, judicial, and institutional principles and practices. The judicial process is not governed by efficiency and speed alone, but also by requirements relating to independence, fairness, reasoned decision-making, and judicial responsibility.[4] The question is therefore no longer simply what technology is capable of doing, but what forms of technological assistance may be appropriate within the judicial environment and within what limits.

This issue is particularly significant in Jordan, where AI has not yet been integrated on an organised institutional basis into judicial decision-making.[5] This makes it possible to examine the issue at a stage preceding broad institutional integration, when the need for such tools, the functions for which they may be appropriate, and the risks and safeguards associated with their use can still be considered before practices become established and more difficult to reshape.

This development also coincides with a Jordanian judicial context in which practical challenges affect the conditions under which judicial decision-making is carried out.[6] Accordingly, the need for AI cannot be assessed separately from those challenges or from the existing forms of support and reform within the judicial system.[7] The inquiry should begin by identifying actual judicial needs and assessing the available means of responding to them before considering whether AI can provide additional value in that context.[8]

The background to this study therefore does not rest on an assumption that digital development should necessarily lead to the use of AI in the judiciary. Rather, it emerges from a broader perspective that connects the use of technology with actual judicial need and from a wider transformation in the relationship between technology and judicial work: from tools that have largely supported the management of the judicial environment to tools that may increasingly approach aspects of substantive judicial work itself.

[4] European Commission for the Efficiency of Justice (CEPEJ) 2025, p. 6, para. 12; Gutiérrez 2025, pp. 19, 28–29; CEPEJ 2018, pp. 8, 11–12.
[5] Ministry of Justice (Jordan) 2024, 'AI and Technology in the Rule of Law Forum'; Jordanian Judicial Council 2023, p. 9
[6] Jordanian Judicial Council 2024, p. 21.
[7] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022, pp. 95–104.
[8] This discussion draws in part on the author's related research: Alqatawna, Ammar, Zsolt Czékmann, and Adrienn Nagy, "Artificial Intelligence (AI) in the Judiciary: A Necessity and an Inevitability – Jordan as a Case Study," Arab Law Quarterly, forthcoming.

1.2 Research Problem

The preceding context reveals a central research problem concerning the appropriate forms of support for judicial decision-making in Jordan. The issue is not simply whether judges face workload and decision-quality challenges, or whether further technological development is possible. Rather, it is necessary to determine how these challenges arise within particular judicial tasks, how far existing forms of support respond to them, and whether additional forms of assistance may be justified.

The persistence of a judicial challenge following the introduction of a particular reform does not, in itself, establish that the reform is unsuitable or ineffective. Continuing difficulties may reflect limitations in implementation, resources, continuity, coverage, or, in some contexts, the practical reach of the reform itself. The relevance of AI therefore lies not in presuming that existing responses should be replaced, but in examining whether its capabilities may provide additional support where identified judicial needs remain.

The emergence of AI adds a new dimension to this problem. Its relevance cannot be determined merely by demonstrating that a particular judicial task can be technically assisted or automated. What requires examination is whether a particular AI use responds to an identified judicial need, what additional value it may be capable of providing, what realistic alternatives are available, and whether its use can remain compatible with the requirements governing judicial decision-making. The suitability of AI must therefore be considered function by function rather than assumed at the level of the technology as a whole.

The research problem addressed by this dissertation consequently lies in establishing a needs-based basis for evaluating AI within the Jordanian judicial context. This requires connecting the practical challenges experienced in judicial decision-making with the capabilities and limitations of possible forms of support, while also identifying the risks, safeguards, institutional conditions, and degree of judicial control relevant to particular AI uses. The objective is not to determine how AI can be introduced as widely as possible, but to identify whether, where, and under what conditions it may constitute an appropriate form of judicial support.

1.3 Aim and Objectives of the Study

The principal aim of this dissertation is to examine whether, in which judicial functions, and under what conditions AI may constitute a justified additional form of support for judicial

decision-making in Jordan in response to identified workload and decision-quality challenges. The study distinguishes identifying a judicial need, establishing a prima facie case for evaluating an AI application, and demonstrating that the application is suitable for deployment. The present research principally addresses the first two stages. Recommendations concerning deployment remain conditional on legal assessment and evidence from testing under the relevant institutional conditions. The study situates AI alongside existing forms of judicial support and realistic alternatives without presuming its comparative superiority, while taking account of the requirements governing the exercise of judicial authority, particularly judicial independence, procedural fairness, reasoned adjudication, and effective human responsibility. To achieve this aim, the dissertation pursues the following objectives:

1. To identify and analyse the principal workload and decision-quality challenges affecting judicial decision-making in Jordan, with particular attention to caseload, legal research, judgment preparation, complex disputes, and expert evidence.

2. To examine the principal procedural, institutional, professional, and existing digital responses to these challenges, assess their practical contribution, and identify factors that may limit their effects or help explain why particular challenges persist.

3. To examine contemporary developments in AI that are most relevant to judicial work, analyse the principal risks associated with their use in judicial decision-making, and examine how these risks are perceived by Jordanian judges in a context where no organised institutional deployment was identified.

4. To examine the judicial principles and considerations relevant to the evaluation of particular AI uses and to establish why any adoption decision requires a comprehensive, function-specific assessment of potential benefits, risks, safeguards, realistic alternatives, and the wider institutional conditions relevant to the proposed use.

5. To examine whether the capabilities of AI provide a justified basis for considering additional support in particular judicial functions and tasks identified as sources of workload or decision-quality difficulty in the Jordanian context.

6. To examine the technological, financial, institutional, cultural, educational, legal, and regulatory challenges that may affect the implementation of judicial AI in Jordan and to develop governance guidance and considerations that may support its responsible evaluation, testing, and possible adoption and inform the future development of a national strategy.

1.4 Research Questions

The research problem and objectives outlined above are addressed through one central research question and six related sub-questions, structured to reflect the analytical sequence of the study. The inquiry begins by identifying the workload and decision-quality challenges affecting judicial decision-making in Jordan and examining the extent to which existing responses address them. It then considers the capabilities and risks of contemporary AI in relation to those identified needs. Since technical capability alone is insufficient to justify judicial use, the analysis proceeds to the legal and normative criteria governing the assessment of AI applications, followed by a function-specific examination of where AI-assisted support may be appropriate. Finally, it addresses the institutional and governance conditions relevant to evaluation, testing, and possible adoption in Jordan. The questions therefore form an interconnected progression from identifying judicial needs and existing responses to assessing technological suitability, justification, and implementation.

Central Research Question: Can AI provide a justified additional form of support for judicial decision-making in Jordan in response to identified workload and decision-quality challenges and, if so, for which judicial functions and under what conditions?

The central question is examined through the following sub-questions:

1. What are the principal workload and decision-quality challenges affecting judicial decision-making in Jordan, and how do they arise within judicial practice?

2. How have existing procedural, institutional, professional, and digital forms of judicial support responded to these challenges, what contribution have they made, and what factors may limit their practical effect or help explain why particular challenges persist?

3. What contemporary developments in AI are most relevant to judicial work, what principal risks may arise from their use in judicial decision-making, and how are these risks perceived by Jordanian judges in a context where no organised institutional deployment was identified?

4. Which legal and normative criteria should govern the assessment of particular AI uses in Jordanian judicial decision-making, and how should those criteria structure the evaluation of benefits, risks, safeguards, and alternatives?

5. Which functions and tasks identified as sources of workload or decision-quality difficulty in Jordanian judicial decision-making may provide a justified basis for considering AI as an additional form of support?

6. What challenges may affect the implementation of judicial AI in Jordan, and what governance considerations should inform its responsible evaluation, testing, and possible adoption and the future development of a national strategy?

1.5 Methodology and Research Design

This study adopts a qualitative legal research design combining documentary and literature-based analysis with semi-structured interviews with Jordanian judges. The documentary component provides the principal basis for examining the legal, institutional, technological, and normative dimensions of the research. The interviews constitute an empirical socio-legal component, providing professional perspectives on judicial practices, existing challenges, and the potential uses and risks of AI. These two components are considered together where appropriate, while recognising their different evidential roles and limitations.

1.5.1 Documentary and Literature-Based Analysis

The documentary analysis draws principally on official Jordanian materials, academic literature, international guidance, and relevant legal sources. In examining these materials, attention is given to their relevance to the research questions, the nature and authority of the sources, and the purposes for which they were produced.[9] Reports issued by the Jordanian Judicial Council (JJC) and other justice-sector institutions are used to examine judicial workload, institutional conditions, existing reforms, and the judicial digital environment. Academic literature provides the main basis for examining AI technologies, their capabilities and limitations, relevant risks, and approaches to responsible governance.

Relevant legislation and selected judicial decisions are used where necessary to clarify the legal and institutional context and to examine the interpretation and implications of applicable legal rules. Judicial decisions were identified through targeted keyword searches in the Qistas legal database, with illustrative decisions selected where they directly addressed the issue under examination. This was an issue-specific search rather than an exhaustive review of Jordanian case law. International guidance and selected foreign experiences are also considered where they provide useful standards or illustrations relevant to Jordan. They are not used to conduct a systematic comparative study, but to support the contextual and evaluative analysis of the issues examined in the dissertation.

[9] Bowen 2009, p. 33.

1.5.2 Semi-Structured Interviews with Jordanian Judges

The empirical component consists of semi-structured interviews with eighteen Jordanian judges. Participants were selected purposively to obtain professional perspectives relevant to the judicial functions and challenges examined in this study.[10] The selection sought, as far as practicable, variation in geographical location, judicial specialisation, professional experience, and judicial function. Eligibility was limited to serving members of the Jordanian judiciary with experience relevant to the study. Participants were recruited through direct personal contact within the researcher's professional network, and practical accessibility and willingness to participate influenced the final composition of the sample. Although this approach enabled access to judges with relevant professional experience, reliance on existing professional contacts may have limited the diversity of perspectives obtained. The sample is therefore treated as a qualitative purposive sample rather than a statistically representative sample of the Jordanian judiciary.

Most participants had between six and ten years of judicial service, while the sample also included judges with shorter and substantially longer experience. Many participants had served in different courts, judicial functions, or areas of specialisation during their careers. Their responses therefore reflected accumulated professional experience rather than only their assignments at the time of the interviews. Four participants were serving primarily in Public Prosecution posts when interviewed, and all had previously served in adjudicative judicial positions. Some other participants also held, or had held, prosecutorial or enforcement assignments.

Participants were invited to draw on their professional experience as relevant to each question. Responses concerning current caseload, workload, or the volume of cases were understood in relation to the participant's position at the time of interview. By contrast, questions concerning matters such as judgment preparation, legal research, expert evidence, and other judicial tasks allowed participants to draw on their accumulated professional experience across previous judicial assignments. Accordingly, the evidential context of each response is interpreted according to the task and experience to which it relates.

The sample was weighted towards Magistrates' Court experience, while current representation from higher courts was limited. It should therefore not be understood as providing balanced

[10] Palinkas et al. 2015, p. 534.

coverage across all judicial levels. The general professional characteristics of the interview participants are presented in Table 1.

Table 1. Professional Characteristics of Interview Participants

Participant	Experience	Current primary function	Principal area of work	Region
P1	More than 10 years	Court of Appeal judge	Civil	Central
P2	6–10 years	Magistrates' Court judge	Civil	Central
P3	Up to 5 years	Magistrates' Court judge	Criminal	Central
P4	Up to 5 years	Magistrates' Court judge	Civil	Northern
P5	6–10 years	Magistrates' Court judge	Mixed	Southern
P6	6–10 years	Magistrates' Court judge	Criminal	Central
P7	6–10 years	Magistrates' Court judge	Civil	Central
P8	6–10 years	Magistrates' Court judge	Civil	Central
P9	6–10 years	Public Prosecutor	Public prosecution	Central
P10	6–10 years	Magistrates' Court judge	Mixed	Northern
P11	6–10 years	Public Prosecutor	Public prosecution	Central
P12	Up to 5 years	Magistrates' Court judge	Criminal	Northern
P13	6–10 years	Public Prosecutor	Public prosecution	Northern

P14	6–10 years	Magistrates' Court judge	Criminal	Central
P15	6–10 years	Magistrates' Court judge	Criminal	Central
P16	6–10 years	Magistrates' Court judge	Mixed	Southern
P17	6–10 years	Enforcement judge	Civil	Central
P18	More than 10 years	Public Prosecutor	Public prosecution	Central

Note: Participant characteristics are presented at a general level to preserve anonymity. Specific courts and precise locations are omitted. "Mixed judicial work" refers to assignments involving civil and criminal work.

The interviews were conducted in Arabic between 12 August and 10 December 2025 and lasted approximately 25 to 60 minutes. Most were conducted remotely using online communication platforms. With the participants' consent, the interviews were recorded, and the recordings have been securely retained by the researcher for the purposes of analysis and verification.

The recorded interviews were first transcribed in Arabic by the researcher. The Arabic transcripts were subsequently translated into English by the researcher before thematic analysis. The original Arabic transcripts and their corresponding English translations were retained to allow quotations and interpretations to be checked against the original wording where necessary. This is particularly relevant because translation may affect the expression of participants' meanings and the interpretation of their responses.[11] To preserve anonymity, the interviewed judges are identified throughout the dissertation by numerical codes from P1 to P18, where "P" refers to the participant.

The interviews focused on matters on which judges could provide direct professional or experiential insight, including judicial workload, judgment preparation, legal research, expert evidence, existing forms of judicial support, and perceptions of AI-related opportunities and risks. The semi-structured interview questions were deliberately broad and open-ended,

[11] van Nes et al. 2010, pp. 314–315.

allowing participants to elaborate on their professional experiences and views rather than limiting them to brief predetermined responses.[12] This format provided a common basis for exploring the principal research topics while allowing flexibility for participants to explain issues in greater detail. The interview guide is reproduced in Appendix 1.

Recruitment concluded after eighteen interviews, when later interviews largely repeated issues already identified and only rarely produced materially new insights. The adequacy of the sample is considered in relation to the concept of information power, which emphasises the relevance and richness of the information obtained rather than numerical size alone. This assessment takes account of the study aim, the specificity of the sample, the use of established theory, the quality of interview dialogue, and the analytical strategy.[13] In this study, the participants' specialised professional experience and the focus on identifiable judicial tasks strengthened the relevance of the interview material. Nevertheless, the breadth of the research questions, the uneven representation across judicial levels, and recruitment through professional contacts limit the range of perspectives captured. The recurrence of similar issues in later interviews is therefore treated as a supporting observation rather than conclusive evidence that all relevant perspectives were exhausted. The interviews were not intended to provide evidence for every aspect of the dissertation. Technical, legal, normative, and governance questions are examined primarily through the documentary sources appropriate to those issues.

1.5.3 Integration and Analytical Approach

The documentary and empirical materials are used according to the nature of the issue under examination. Interview findings are relied upon where judicial experience or professional perception is relevant, while official materials, academic literature, legal sources, and international guidance provide the principal basis for institutional, technical, legal, and normative analysis. The interview accounts are therefore treated as evidence of participants' professional perceptions and experiences rather than as objective representations of the Jordanian judiciary as a whole.

The English translations of the Arabic interview transcripts were analysed thematically by the researcher in relation to the research questions. The analysis combined deductive and inductive coding: the research questions and interview guide provided an initial analytical orientation,

[12] Leech 2002, pp. 665–666.
[13] Malterud et al. 2016, pp. 1754–1755.

while additional codes were developed from issues and distinctions emerging from participants' responses. Through repeated comparison of the interview material, related codes were grouped and refined into broader themes.[14] Divergent or contradictory views were also considered in defining and qualifying those themes rather than being excluded because they were less frequently expressed. For example, one participant identified case summarisation, identification of relevant legal provisions and precedents, and assistance with routine procedural elements as potential uses of AI. These responses were coded as "case summarisation", "legal research support", "precedent retrieval", and "procedural assistance", and were subsequently grouped under the broader theme of "AI-supported judicial tasks". This theme helped identify judicial tasks that participants regarded as potentially suitable for AI support, while the legal and normative appropriateness of those uses was assessed separately through the relevant documentary sources.

Recurring themes, differences between participants, and areas of convergence or divergence between judicial perceptions and the literature were then examined. Where numerical frequencies are reported, they are used descriptively to indicate the prominence of particular views within the interview sample and are not treated as statistical estimates of the views of the Jordanian judiciary as a whole.

1.5.4 Ethical Considerations and Researcher Positionality

Participation in the interviews was voluntary. Before each interview, participants were informed of the research purpose and verbally agreed to participate and to the academic use of their responses. Permission to record was obtained at the start of each interview. Identifying information is not disclosed in the dissertation, and participants are referred to by numerical codes. Professional characteristics and interview quotations were presented with attention to the risk of identification, particularly given the relatively small size of the Jordanian judicial community. Specific courts, precise locations, and other unnecessary identifying details were omitted where possible. Nevertheless, numerical coding and the removal of direct identifiers cannot completely eliminate the possibility of indirect identification. Interview recordings, Arabic transcripts, and their corresponding English translations have been retained securely by the researcher and are not made publicly accessible.

The researcher's professional experience within the Jordanian judiciary provided familiarity with judicial institutions, terminology, and working practices and facilitated access to

[14] Braun and Clarke 2006, pp. 83–84, 87–89.

participants. All participants were professionally known to the researcher, but the researcher had no supervisory or hierarchical authority over them. This shared professional background may have facilitated communication and mutual understanding. However, the researcher's position as an insider may also have influenced participants' responses, the assumptions shared during interviews, and the interpretation of their accounts.[15] Accordingly, attention was given to distinguishing participants' statements from the researcher's interpretation and to comparing interview findings with documentary evidence where appropriate.

1.6 Scope and Limitations of the Study

This dissertation focuses on selected challenges and functions within judicial decision-making in the Jordanian regular judiciary, particularly those associated with judicial workload and decision quality. It does not seek to provide an exhaustive account of every challenge affecting judicial decision-making. Rather, it concentrates on issues identified as particularly relevant through the documentary analysis and interview evidence, including case review, legal research, judgment preparation, complex disputes, and expert evidence. Broader administrative and organisational functions, including general case management and hearing administration, fall outside the principal scope of the study except where they directly affect judicial decision-making.

The study examines AI according to the judicial functions it may support rather than according to particular commercial products or systems. International experience is used selectively to illustrate relevant applications, risks, and governance approaches, without undertaking a comprehensive comparative study or assuming that foreign models can be transferred directly to Jordan. As the research was conducted in a context in which the evidence reviewed did not establish organised institutional deployment of AI within judicial decision-making and did not test a particular AI system on Jordanian case files, it does not provide direct measurements of system accuracy, time savings, verification requirements, Arabic legal-language performance, or long-term behavioural and institutional effects. Given the rapid development of AI technologies, the dissertation therefore focuses primarily on judicial functions, risks, safeguards, and institutional conditions rather than on the temporary characteristics of particular systems or products.

[15] Berger 2015, p. 219.

The empirical component is qualitative and based on purposive interviews with eighteen Jordanian judges. The findings reflect professional perspectives and are not statistically representative of the Jordanian judiciary. Although many participants had experience across different judicial functions, most had ten years or less of judicial service, and the sample was weighted towards Magistrates' Court experience, with limited representation from higher courts. Accordingly, the study does not compare judicial challenges across judicial levels or years of experience. Recruitment through the researcher's professional network may have limited the diversity of perspectives obtained, while translation of the Arabic interviews into English before analysis may have affected some nuances of meaning.

1.7 Originality and Significance of the Study

This dissertation offers a needs-led, interview-based assessment of judicial AI in Jordan, drawing on eighteen semi-structured interviews with judges alongside official reports, judicial decisions, and academic literature to identify practical challenges and examine relevant AI functions. Its empirical contribution lies in providing direct evidence on judicial workload, decision quality, existing forms of support, and judges' perceptions of the possible uses and risks of AI within the Jordanian judicial context. Its conceptual contribution lies in grounding a function-specific assessment of judicial AI in empirical evidence of Jordanian judicial needs, rather than assuming those needs or beginning with particular technologies. The dissertation examines whether AI may provide appropriate support in selected areas, including case-file review, legal research, judgment preparation, complex disputes, and expert evidence, while distinguishing functions that may be suitable for assistance from those that should remain under direct judicial control.

The dissertation also makes a governance contribution by translating its normative, empirical, and institutional findings into governance considerations and a phased evaluative approach for assessing particular AI uses in the Jordanian judicial context. These considerations address judicial oversight, transparency, accountability, data governance, proportionality, institutional control, and the evidential conditions relevant to testing and possible adoption. In this way, the study connects identified judicial needs with a function-specific assessment of AI assistance and the institutional conditions that should inform future decisions on its use.

1.8 Structure of the Dissertation

This dissertation is organised into eleven chapters. Following the present introductory chapter, Chapters Two to Four establish the practical and institutional context of judicial decision-making in Jordan. Chapter Two examines workload challenges, focusing on the volume of cases handled by judges and on the time and support required for judgment preparation and legal research. Chapter Three addresses judicial decision quality and considers the factors that may affect it in practice. Particular attention is given to the increasing complexity of disputes and to the role of expert evidence, especially where judges are required to assess technical matters outside ordinary legal expertise. Chapter Four then examines the principal conventional responses to these challenges, including procedural reform, judicial specialisation, continuing judicial training, and technical offices. Rather than treating these mechanisms as unsuccessful or assuming that they should be replaced by AI, the chapter considers their contribution and the circumstances that may limit their ability to respond to particular judicial needs.

Chapters Five to Seven provide the technological, risk-related, and normative foundations for assessing AI in judicial decision-making. Chapter Five explains the concept and development of AI and examines the technologies most relevant to judicial work, including systems capable of processing legal text, supporting research, and generating or analysing written material. Its purpose is to establish what these technologies may and may not be capable of doing before considering their use in the judicial context. Chapter Six then examines the principal risks associated with judicial AI. It draws on the relevant literature, comparative experience, and interviews with Jordanian judges to consider concerns relating to judicial independence, transparency, bias, individualised justice, overreliance, and the reliability of AI outputs. Chapter Seven develops a normative framework for the use-specific assessment of judicial AI. It examines how potential benefits should be considered alongside judicial values, operational safeguards, and realistic alternatives, and distinguishes the intensity of assessment required by a particular function from the separate question of its deployment status. The framework differentiates between uses requiring baseline or enhanced assessment and uses excluded under the present analysis, without treating classification itself as authorisation for deployment.

Chapters Eight to Ten apply this analysis to the Jordanian context. Chapter Eight examines the potential functional role of AI in addressing the judicial needs identified earlier in the dissertation. It considers applications relating to case-file analysis and summarisation, legal research, judgment preparation and legal reasoning, and the examination of expert evidence.

These possible functions are examined in terms of their potential usefulness, their proximity to substantive judicial judgment, and the concerns expressed by the interviewed judges. Chapter Nine moves from functional suitability to practical feasibility. It examines the technological, financial, institutional, professional, and legal challenges that may affect the introduction of judicial AI in Jordan. This distinction is important because an application may appear useful in principle while remaining difficult or inappropriate to implement under existing institutional conditions.

Chapter Ten brings the preceding analysis together by setting out governance considerations and a phased evaluative approach for judicial AI in Jordan. It emphasises judicial control, safeguards, institutional responsibility, and evidence-based progression. Proposed uses should be assessed against identified needs and realistic alternatives and, where justified, tested before any limited institutional use. The chapter does not presume that AI is required for every judicial challenge or that successful testing should lead to wider adoption.

Finally, Chapter Eleven concludes the dissertation by bringing together the answers to the research questions and the principal findings of the study. It identifies the main academic and practical contributions, presents the principal recommendations arising from the research, and discusses the study's limitations and areas for future research. In this way, the dissertation progresses from identifying the conditions and challenges of judicial decision-making in Jordan to evaluating the possible role of AI and, ultimately, to considering the conditions under which particular applications may responsibly be considered.

2. Workload Challenges in Judicial Decision-Making in Jordan

A judge's time is among the most valuable and limited resources available to any judicial system. The effective use of that time is therefore central to judicial productivity and to the quality of adjudication. This chapter examines judicial workload from this perspective, focusing on how judges allocate the time and effort available for judicial work and on the tasks within the judicial decision-making process that consume a significant share of those resources. Particular attention is given to distinguishing between tasks that require the judge's direct legal judgment and responsibility and tasks in which the judge may potentially receive administrative, human, or technological support without transferring the judicial function itself.[16]

Judicial workload refers to the time and effort required to perform judicial duties within a specified period. Caseload is an important component of workload and concerns the number and composition of cases requiring judicial attention. The workload associated with a given caseload may vary according to factors such as case complexity, procedural demands, judicial functions, and the human, institutional, and technological support available. Raw case numbers therefore indicate the volume of judicial work but do not, by themselves, provide a complete measure of workload.

Judicial workload has different causes that contribute to its increase, including legislative factors, social and cultural factors, administrative and organizational factors, procedural factors, and factors related to litigants. Legislative change may affect both the number and complexity of matters reaching the courts, although the direction and magnitude of that effect depend on the nature of the reform. New legislation may create new categories of disputes or offences, while other reforms may simplify procedures or reduce the need for litigation. An example of this is when the law criminalizes certain acts that were not previously criminalized or did not previously exist, such as cybercrimes, which did not exist 30 or 40 years ago and have now come to constitute a large share of the cases brought before the courts.[17] The fragmentation of legislation also increases the complexity of a judge's work, because the judge becomes required to be familiar with a larger body of laws. This also results in complications related to conflicting provisions, jurisdiction, and an expanded scope for judicial interpretation, all of which contribute to increasing the litigation workload. There are also social and economic reasons linked to the economic situation, the size of debts, business activity, increased awareness of rights, and resorting to courts instead of settlement.[18] There are administrative reasons related to the number of judges and their assistants, infrastructure, and court administration. In addition, technical factors may contribute to judicial workload, particularly the limited automation of routine judicial and administrative tasks and the incomplete integration of electronic case-management systems.[19] There are also reasons related to

[16] Mack, Wallace and Roach Anleu 2012, p. 1.
[17] Aruan and Rahmayanti 2025, pp. 13–14.
[18] Eisenberg, Kalantry and Robinson 2013, p. 260.
[19] CEPEJ 2023, pp. 25, 37–39; Bosio and Upegui Caro 2024, pp. 6, 9–10; Rooze 2010, pp. 50, 55–58.

litigants' behaviour, such as procrastination and filing vexatious claims.[20] Other reasons relate to the limited resort to alternative dispute resolution (ADR) mechanisms such as mediation and arbitration, such that going to court is considered the first option for litigants.[21]

The rise in judicial workload is not merely indicators and numbers that can be ignored, as the consequences of an increase in judicial workload beyond a reasonable limit are many and varied. The first direct effect of an increased judicial workload is slow adjudication and the prolongation of litigation, which is a form of denial of justice.[22] Where incoming cases consistently exceed the capacity of courts to resolve them, judicial workload pressures may contribute to the accumulation of pending cases. Pending caseloads and clearance rates are therefore important indicators for assessing judicial performance and identifying potential backlogs.[23] Judicial workload also affects the overall quality of judicial work, from procedures through to the final judgment. It also has a clear and evident impact on judges and their assistants, and on the extent of physical and psychological fatigue they are exposed to; this has repercussions that make judicial service less attractive as a profession, leading many distinguished individuals to refrain from entering the judiciary. The JJC, as the official body concerned with appointing judges, has noted that one of the most important challenges it faces in addressing the shortage in the number of judges is the reluctance of many targeted groups to apply for admission and appointment competitions in the judiciary, given the large judicial workload placed on judges in Jordan.[24]

This chapter focuses on workload challenges arising within the judicial decision-making process rather than on the broader external causes of judicial workload outlined above. Drawing on official reports issued by the JJC and interviews conducted with 18 Jordanian judges, the analysis identifies three principal dimensions of workload relevant to this study: the high volume of cases handled by individual judges; the time and effort required for judicial decision-writing, particularly in the context of limited drafting support; and the demands of legal research where available research support remains limited in particular respects. These dimensions are examined in the following sections.

2.1 High Volume of Cases per Judge

The high volume of cases handled by individual judges is a major source of judicial workload. This section examines the issue through the relevant literature and official reports, followed by the findings of the interviews conducted with Jordanian judges.

[20] Belli 1981, p. 16.
[21] Gupta 2025, pp. 10–11, 15.
[22] Pedro 2024, p. 2.
[23] CEPEJ 2023, p. 12.
[24] Jordanian Judicial Council 2022, p. 98.

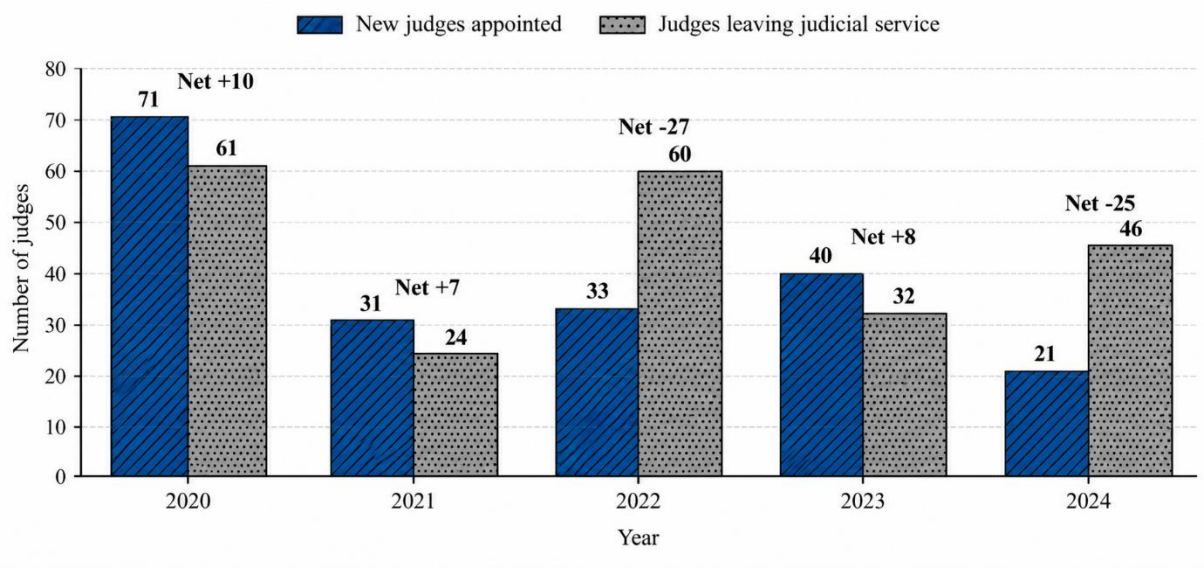
2.1.1 Literature and Official Reports

High caseloads and case backlogs have been reported in a number of judicial systems, although their scale, causes, and methods of measurement differ substantially across jurisdictions and court types.[25] Selected international examples are therefore used here only to illustrate different manifestations of case-volume pressure rather than as directly comparable benchmarks for Jordan. In India, more than 50 million cases were pending across the judicial system in 2023.[26] In the United States immigration court system, the backlog exceeded 3 million cases in November 2023, with individual immigration judges reportedly carrying very large caseloads.[27] Within the European Union (EU), the 2024 EU Justice Scoreboard also reports substantial differences among Member States in case duration and clearance rates, including lengthy proceedings in certain complex categories of cases.[28]

Jordan also faces substantial case-volume pressures. Although Jordan's population is almost 12 million, the total number of judges across the judicial system remains below 1,000.[29] Moreover, the annual increase in the number of judges is usually modest when compared to the number of judges whose service ends each year for various reasons.[30] As illustrated in Figure 1, which compares appointments to substantive judicial positions with judges whose service ended between 2020 and 2024, the figures show 196 appointments and 223 departures, producing a net flow balance of −27 judges over the period. This indicates that appointments did not fully offset the number of judges leaving judicial service during these five years.

[25] Xu 2022, pp. e2013652-1026–e2013652-1027.
[26] Government of India, Ministry of Law and Justice 2023, p. 1; see also Yasir 2024.
[27] TRAC 2023.
[28] European Commission 2024, EU Justice Scoreboard 2024, pp. 11-21.
[29] Department of Statistics (Jordan) 2025, p. 1; Jordanian Judicial Council 2024, p. 21.
[30] Jordanian Judicial Council 2024, p. 21, 24.

Figure 1 judicial appointment and departure in Jordan, 2020-2024



Cumulative balance (2020–2024): 196 appointed; 223 departures; net change −27 judges.

Source: Author's compilation based on the Annual Reports of the Jordanian Judicial Council, 2020–2024.

In contrast, the annual reports issued by the JJC indicate that the total number of incoming cases across all courts has not shown a significant increase over the past eight years. In 2024, the JJC reported 403,409 incoming cases and a total of 938 judges at the end of the year.[31] The same report separately recorded an average judicial caseload of 618 cases per judge in 2024.[32] The total number of resolved cases slightly exceeded incoming cases, with 417,145 cases resolved in 2024, resulting in a disposition rate of 103.4%.[33] The number of pending cases stood at 61,682 at the end of 2024, the lowest figure reported in the past decade.[34]

The Report of the Royal Committee for Developing the Judiciary and Enhancing the Rule of Law (2017) acknowledged that, despite the standing of the Jordanian judiciary, it faced a shortage of specialised judges and an increasing volume of cases requiring judicial determination.[35]

Despite the importance of the official statistics published by the JJC, these statistics appear to focus primarily on the number of cases rather than on differences in case complexity and the judicial time and effort required to resolve them. Case-weighting provides a more nuanced approach to measuring

[31] Jordanian Judicial Council 2024, p. 21, 27.
[32] Jordanian Judicial Council 2024, p. 31.
[33] Jordanian Judicial Council 2024, p. 28.
[34] Jordanian Judicial Council 2024, p. 29.
[35] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017, p. 25.

judicial workload by taking such differences into account, as reflected in the methodology examined by the European Commission for the Efficiency of Justice (CEPEJ).[36]

2.1.2 Interview Findings on Judicial Caseload

The interview findings with the participating judges show that the majority of judges believe they are facing a noticeable increase in the number of cases they hear. This perception was repeated among judges from both civil and criminal specialisations, as well as among some members of the public prosecution, and across courts inside and outside the capital, Amman, with the observation that the volume of incoming cases appears greater in Amman.

By contrast, some participants pointed to a relative decline in the judicial workload in the recent period as a result of certain legislation, while emphasizing that they continue to deal with a large number of claims, but within limits that remain "manageable" (P8).[37]

The interviews also showed variation in the number of new incoming cases. One participant in Amman reported receiving approximately 120 new criminal claims per month (P3), while another participant specializing in cybercrimes stated that he receives around 35 new claims per month (P14). A third participant reported that his incoming caseload is about 100 civil cases per month (P4).

In addition to the "monthly intake," some participants highlighted the "total/active caseload" as the total number of cases registered with the judge, including new cases as well as cases postponed from previous months; the total/active caseload for some ranged between 300 and 400 claims (P6).

The interviews further indicated that judicial workload differs not only in volume but also in composition. Although judges in major cities such as Amman and Irbid commonly face high monthly caseloads, judges in smaller towns and rural areas may be required to hear cases across a wider range of legal fields because of the lower degree of judicial specialisation in those areas (P5; P10; P16).

One participant described the judicial workload as follows: "In truth, the incoming caseload has in fact been, and still is, increasing—steadily increasing—each month more than the month before. In my view, it would take two judges to manage this volume of monthly cases; the current workload, whether the workload already pending or the new workload each month, exceeds the normal capacity that any judge can naturally bear." (P15)

Analytical summary: The official statistics and interview findings indicate that judicial caseload remains a substantial source of workload in Jordan. The issue is not necessarily a continuous annual increase in the total number of incoming cases, but rather the relationship between the volume and composition of cases, total/active caseload, and the judicial resources available to deal with them. The

[36] CEPEJ 2020, pp. 4–5.
[37] Participants are identified by numerical codes to protect their anonymity. Their general professional characteristics are presented in Table 1 in Chapter One.

interviews also show that workload varies between courts, geographical areas, and judicial specialisations, with some judges handling high monthly intake while others deal with a wider range of subject matters. These findings suggest that aggregate case numbers alone provide only a partial picture of judicial workload. A fuller assessment would also require attention to case complexity and weight, work performed inside and outside the courtroom, and administrative, research, and other professional tasks undertaken by judges.[38]

2.2 Decision-Writing as a Workload Challenge: Limited Drafting Support

This section examines judicial decision-writing in Jordan as a major contributor to judges' workload, focusing on how the time-intensive nature of drafting affects day-to-day judicial work. It is structured in two parts. Section 2.2.1 reviews the relevant literature, and reports to explain how decision-writing is characterised, what workload pressures are most frequently identified, and how existing drafting support is assessed. Section 2.2.2 then presents interview insights to show how Jordanian judges experience these pressures in practice, particularly the amount of time devoted to drafting and the extent to which available support mitigates (or fails to mitigate) that burden.

2.2.1 Literature and Official Reports

Despite the importance of all stages of the judicial decision-making process, and their impact on ensuring the quality of the judicial decision, not all tasks performed by judges when issuing a decision are complex mental activities that represent the core of judicial work. In relation to judicial decision-making, the drafting of the judicial decision stands out as one of the steps and stages of that process. The judicial decision is the intended purpose of resorting to the court, as it contains the operative part of the judgment, and it reflects what precedes the issuance of the judgment through the stages of the case, starting with its registration and passing through trial procedures, hearings, exchange of submissions, the hearing of witnesses and evidence, and other matters. The judicial decision represents the judge's legal reasoning and is proof of the judge's ability to understand the case, extract its facts, and deal with its evidence. In the judicial decision, the judge also demonstrates the ability to understand legal texts, interpret them, and apply them to the facts of the case. The judicial decision does not merely set out the legal and factual reasons for the ruling; it also discusses the parties' arguments, endorsing what the judge considers correct and refuting what the judge considers otherwise, always stating the reasons and justifications.

The importance of giving due care to drafting the judicial decision is highlighted by the significant effects that flow from it. The judicial decision is the first and most important material upon which higher courts, whether courts of appeal or the Court of Cassation, base their oversight of the judgment. There

[38] Mack, Wallace and Roach Anleu 2012, p. 182.

can be no judicial review without the existence of the judicial decision, and any deficiency in drafting the decision negatively affects the higher court's task of reviewing it.[39] The judicial decision is also important in clarifying rights and legal issues for the parties to the case, so that they are able to understand the decision and exercise their legal right to challenge it if they wish, or so that it may serve as a means to end the judicial dispute at this stage if they are convinced by its content and see no benefit in appealing it.

The judicial decision is likewise a means by which judges enrich legal knowledge and legal thought in general; how many legal principles have emerged from judicial decisions, and how many statutes and legal provisions are, in their origin, judicial decisions drafted by judges.[40] Legal scholarship builds and develops its studies and research by relying on judicial rulings. In this sense, the judicial decision has an aspect of general oversight over courts and the legal system, and over the right of access to justice in general.[41] In addition, the Consultative Council of European Judges (CCJE) notes that the purpose of a judicial decision is "not only to resolve a given dispute providing the parties with legal certainty, but often also to establish case law which may prevent the emergence of other disputes and to ensure social harmony."[42]

The Jordanian legislator has recognized this importance of the judicial decision and has therefore prescribed a set of required contents that the judicial decision must include. These are set out in Article 160 of the Jordanian Code of Civil Procedure, which provides: "The judgment shall state the court that issued it, the date of its issuance, and its place; the names of the judges who participated in issuing it and were present at its pronouncement; the full names of the parties; their attendance or absence; and the names of their representatives. The judgment shall also include an overall presentation of the facts of the case and the parties' claims, a brief summary of their defences and their essential arguments, the reasons for the judgment, and its operative part." These contents are legal requirements that judges must observe when drafting their decisions. The judiciary itself, represented by the Jordanian Court of Cassation as the highest court in Jordan, has affirmed in many of its decisions the necessity for the court to observe the judgment contents set out in that article. It has treated a failure to observe these contents as a defect that may give rise to different judicial consequences depending on the circumstances, and that may render the judicial decision void, or tainted by a defect of insufficient reasoning and justification.[43]

This importance surrounding the judicial decision makes drafting it one of the judicial tasks that require the greatest effort, time, and concentration from judges. A study that included magistrates and judges

[39] Assaf 2023, p. 225.
[40] For a doctrinal discussion of the role of judicial decisions and the scope of their authority in civil law systems, see Spaić 2018, pp. 28, 31–32.
[41] Mack, Wallace and Roach Anleu 2012, p. 81.
[42] CCJE 2008, para. 7.
[43] Court of Cassation (Jordan) 2024, Civil Cassation Decision No. 7721/2024, 9 December 2024.

of higher courts in Australia indicated that a large portion of judges' working time is consumed in drafting judicial decisions, noting that judges in higher courts and courts of appeal spend several hours drafting decisions.[44] The study also reported that some magistrates experienced insufficient time for judgment writing during ordinary working hours and consequently undertook this work after hours, including at home.[45] The study also shows that work pressure affects the time available for drafting judicial decisions and causes increasing pressure even during weekend breaks for judges.[46] One judge observed that the demanding work of writing a reserved judgment begins after the hearing has concluded.[47]

This study does not aim to verify the importance of drafting the judicial decision or the required contents mentioned above; rather, the researcher affirms the importance of these contents, given their role in ensuring that the judicial decision is sufficiently complete and provides an adequate reflection of the case, its proceedings, and the ruling and its reasons. However, this study calls for a deeper examination of these contents and for classifying them according to the criterion of the workload these tasks create, and according to the criterion of the possibility of assisting the judge in carrying out these tasks.

For the purposes of this study, the required contents of a judicial decision can be distinguished according to the degree of substantive judicial judgment involved in their preparation. Certain elements, such as the name of the court, the names of the judges and parties, the date of the decision, representation details, and parts of the procedural history, are largely factual or formal in nature and may not ordinarily require the same degree of legal reasoning as the evaluation of evidence, legal qualification of the facts, application of law, and formulation of the reasons for the judgment. This distinction does not diminish the legal importance of the formal elements, but it raises the question whether judges must personally perform every stage of their preparation or whether some could be prepared with appropriate support and subsequently verified by the judge. Some legal scholars have similarly argued that certain formal requirements applicable to judicial decisions could be simplified while preserving the essential requirements of judicial reasoning.[48] The time and effort required for decision-writing may also vary according to the level and jurisdiction of the court, judicial specialisation, available resources, and judicial workload.[49]

The most recent official reports issued by the JJC also identify a persistent shortage of personnel assigned to type hearing records and final judgments.[50] These reports do not, by themselves, establish

[44] Mack, Wallace and Roach Anleu 2012, p. 83.
[45] Mack, Wallace and Roach Anleu 2012, p. 86.
[46] Mack, Wallace and Roach Anleu 2012, p. 87.
[47] Mack, Wallace and Roach Anleu 2012, p. 88.
[48] Opeskin 2001, Appellate Courts and the Management of Appeals in Australia (Australian Institute of Judicial Administration, 2001), cited in Mack, Wallace and Roach Anleu 2012, p. 81.
[49] Mack, Wallace and Roach Anleu 2012, p. 4.
[50] Jordanian Judicial Council 2021, p. 119; Jordanian Judicial Council 2022, p. 99; Jordanian Judicial Council 2023, p. 153; Jordanian Judicial Council 2024, p. 140.

the extent to which substantive judgment drafting contributes to judicial workload. They do, however, demonstrate continuing limitations in the administrative and technical support available for the material preparation of judicial records and decisions. Significantly, the JJC has also called for technological solutions that could reduce reliance on the typist function in courts.[51] Taken together, these observations indicate an institutional concern with the human resources and practical effort required for the preparation of judicial decisions, while remaining analytically distinct from the substantive legal reasoning involved in drafting them.

2.2.2 Interview Findings on Decision-Writing

Participants expressed that drafting the judicial decision, in its material and practical sense, represents a major burden in terms of time and effort, albeit to varying degrees. One participant stated that drafting the routine procedural parts within the decision constitutes between 70% and 80% of the overall length of the judicial decision (P4). Another participant estimated that one-third of his daily time and effort is consumed by the material task of writing the judicial decision (P15). A third participant indicated that, during one year of his service, he used to work for six hours at home after finishing his work at court, and that he would spend those six hours preparing the contents of judicial decisions, including drafting the course of the trial, legal texts, and quotations (P13).

Another participant expressed the same idea differently, stating: “I remember when I used to hear some labour cases, the preamble would take between an hour and an hour and a half before I even started writing my decision. When we talk about an hour to an hour and a half, that is time I should be focusing on the conclusions from which the judgment is derived. But when I am dealing only with the preamble, for example, the course of the trial, or arranging witness testimonies, or things like that, I think it is exhausting for the judge, and that time could be put to something more useful.” (P8)

When one participant was asked about the challenge of drafting the judicial decision from his perspective, he responded: “There is a part of the judgment which, even if required, does not involve any mental or legal work that must be done by the judge. The case number; the names of the parties; the offences charged; a summary of the facts of the case as set out in the prosecution’s attribution or in the statement of claim; the course of the trial that took place; and the legal texts. There is no need for the judge to write these personally, because they do not require specialized legal mental work by the judge. Anyone can write or prepare them. The judge’s legal work is focused on identifying the established facts and how those facts were reached; the evidence in the case; and certainly, scrutinizing the evidence, examining it, weighing it, excluding what is not appropriate, and applying the law to the facts in order to reach the outcome of the judgment. Anything other than that constitutes a burden on the judge, because the judge is required to include it in the judgment as part of the required contents

[51] Jordanian Judicial Council 2024, p. 141.

stipulated by law, even though it is not part of the precise legal work that only the judge can uniquely carry out." (P14)

Some participants also emphasized that the length of trial proceedings is reflected in the time required to draft the judicial decision, since the judge must provide a summary of those proceedings in the final decision (P16). Another participant indicated that the required contents of a judicial decision include formal conditions that have no connection to the substance of the decision, and that they represent an old method of decision-writing that should change (P12).

From the angle of practical solutions, one participant considered that it is not possible to rely on the human element (i.e., staff) to assist him in drafting the judicial decision, because that would require him to proofread what the typist has produced, and that proofreading process is harder than drafting the decision himself; therefore, he prefers an electronic tool for recording the decision, such as voice typing (P1). Another participant expressed that, due to the challenge of drafting the judicial decision, he began using several electronic means that help him with decision-writing, including photographing certain paper-based judicial documents and converting them into text that can then be used and copied into the judicial decision, as well as using speech-to-text programs (P2).

Analytical summary :Jordanian legislation requires judges to follow a specific approach and format for drafting judicial decisions, which includes inserting certain prescribed contents. The official reports issued by the JJC have shown a challenge represented by the shortage of staff assigned to support judges in typing judicial decisions, and that this challenge has persisted for years due to limited financial allocations needed to appoint staff.

The interview findings indicate that drafting the judicial decision is one of the most prominent challenges facing the Jordanian judge, as well as one of the judicial tasks that consumes the greatest amount of time and effort. This conclusion was repeated among participants regardless of specialisation, workplace, or years of service. A number of them also expressed the need to introduce other mechanisms to assist them in drafting judicial decisions, especially in their formal and routine aspects, so that the judge's time and effort can be redirected toward the core elements of the judgment that cannot be performed except by the judge personally, such as scrutinizing and evaluating evidence, providing reasons, and applying the law to the facts in order to reach the final outcome.

2.3 Legal Research as a Workload Challenge: Limited Research Support

This section examines legal research as a major workload challenge for judges in Jordan, focusing on how limited research support increases the time and effort required to locate, verify, and apply relevant legal sources. It is structured in two parts. Section 2.3.1 reviews the relevant literature and reports to identify how judicial legal research is described, what obstacles are most frequently highlighted (including access to legal materials and research tools), and how support mechanisms are assessed.

Section 2.3.2 then presents interview insights to show how these issues are experienced in practice, particularly the extent to which judges must conduct research personally due to gaps in institutional or technological support.

2.3.1 Literature and Official Reports

One stage of judicial decision-making is identifying the legal texts that govern the facts or the dispute, so that the judge begins searching for the legal provisions relevant to the facts in order to apply the rule of law to them. What is meant by "legal texts" or the "rule of law" here is law in its broad sense, not only the statutes enacted by parliament. It includes legal rules starting with the Constitution, passing through international treaties, statutes enacted by parliaments, regulations issued by the government, instructions issued by the competent ministers, and bylaws, schedules, and other instruments. These laws are in constant and continuous movement: they are repealed at times, amended at others, and merged with other legislation. Although the laws directly related to judicial work are specific and defined, judges may sometimes need to refer to many organizational laws that are not directly connected to judicial work, due to practical need. This intense diversity and the constant movement of legislation make it difficult for judges to remain consistently up to date and familiar with these different laws and the amendments that affect them, particularly when judges exercise a general jurisdiction that is not limited to cases governed by specific laws, or when a judge moves from one specialisation to another that differs from his previous specialisation. In such cases, the judge is in greater need of tools that assist and support legal research for identifying the relevant legal texts.

Historically, and in the Jordanian context, the means by which judges accessed legal texts was by reading these laws in paper form from their sources, particularly the Official Gazette, which is responsible for the official publication of laws and upon which the entry into force of such laws is typically based on specific dates of publication. Paper publications issued by other official and unofficial bodies, such as booklets containing the text of laws, were also among the means used. What all of these means shared was that they were paper-based writings that required the judge to physically possess them in order to read and review their content.

Later, digital tools and computer programs emerged, or what is known as Computer-Assisted legal Research, which in fact began in the United States through Lexis (now LexisNexis) and Westlaw from the 1970s, then developed gradually through the 1980s and 1990s, and became among the most important legal research tools in the United States.[52]

[52] Hellyer 2005, pp. 285–288.
The European Union has also developed digital search tools through which legal texts and judicial decisions (case law) from EU Member States can be accessed and shared. These tools have created platforms for knowledge exchange, supported access to justice, and strengthened mutual trust. They may also contribute to developing a more common understanding and practice among Member States, despite their linguistic diversity. See Ontanu and Velicogna 2019, pp. 252–253.

In Jordan, the "Adalah" program appeared as a legal research tool for publishing legal texts and judicial precedents, enabling judges to read and access them.[53] Digital means then developed further with the spread of the internet, whether through official sources such as the Jordanian Legislation website or the Legislation and Opinion Bureau, or through non-official sources that expanded their services to provide significant capabilities for searching legal texts, the amendments made to them, and the related legislation connected to these laws such as the "Qistas" program, so that access to legal texts became easier than before.[54] The company owning the Qistas program also began a gradual introduction of new services supported by AI, among the most important of which are enabling search using natural language and providing legal chat tools and legal Q&A features.[55]

Despite the significant improvement in access to legal materials through digital research tools, the basic method of legal research remains largely similar to the traditional paper-based approach in one important respect: the judge must still initiate and conduct the search manually. The judge identifies the relevant legal issue, formulates the search terms, reviews the results, and determines which legal provisions or judicial precedents are applicable to the dispute. Existing tools therefore facilitate access to legal sources, but they do not generally operate as proactive decision-support systems capable of automatically identifying and presenting the legal texts and precedents most relevant to the facts and legal issues of the case. As a result, the judge remains responsible for manually filtering and evaluating the available material in order to reach the sources most closely connected to the dispute.

In fact, legal research in its broad sense is not limited to identifying legal texts only; it extends to searching for prior judicial decisions from diverse types of courts, and it also extends to legal doctrine. In Jordan, the judicial decision is a guiding source among the sources of law to which judges most often resort, to be guided by the rulings of other judges who came before them on the matter before them. If the judicial decision is issued by the General Assembly of the Court of Cassation in Jordan, it is issued by the highest judicial body, and it is often viewed as laying down legal principles that judges in other courts rarely depart from, because it is the final reference in deciding judicial appeals and has the conclusive word in that regard. As noted above regarding the search for legal texts, the same applies to research into judicial decisions and legal doctrine, which progressed from reading paper publications issued by official and unofficial bodies to later developments in computer programs and websites that provide search services for judicial precedents and legal doctrine.

In reality, legal research for legal texts may appear more complex than a standard search process. Judges, as human beings, are susceptible to error and forgetfulness. A judge may apply a general provision while overlooking the existence of a special provision that is more directly applicable and takes priority over the general provision. The fragmentation and diversity of legislation, across statutes,

[53] Adaleh Legal Information Center n.d.
[54] Qistas n.d.
[55] Qistas n.d.

regulations, instructions, and the amendments that affect them, make it impossible to fully ensure the judge's complete awareness of them. What applies to searching legal texts appears even more clearly in searching judicial precedents: thousands of judicial decisions are issued daily by different courts, and they cannot be tracked in the same way that legal texts are tracked, given that legal texts are issued by specific bodies. The same is true of legal doctrine, which is among the most challenging types of research for a judge. The sources of legal doctrine are dispersed in a random manner across libraries or digital sources, without classification of these works or evaluation of their reliability. Many of them are not available for free, and some works may not be available in Arabic, which necessitates translating them from other languages.

2.3.2 Interview Findings on Legal Research

The interviews conducted with the judges who are the subject of this study showed that there are a number of programs used by Jordanian judges as legal research tools, including the Qistas program and the Qararak program. These programs are commercial products and were not designed by an official body exclusively to serve judges; rather, the JJC subscribes to them in order to provide their services to judges (P5).

Most participating judges praised the programs provided by the Judicial Council in this regard, noting that they offer significant effectiveness and that judges rely heavily on them to keep up with legal texts and their amendments, as well as judicial jurisprudence (Ps 1; 2; 3; 4; 5; 6; 7; 8; 9; 14; 15; 16; 17).

However, a number of judges raised several observations about their use of these tools. Some considered these tools weak in terms of providing comparative criminal case law from outside Jordan, despite their need for such decisions (P11). The findings also show a clear variation in the type of research material and the challenges it poses. Most participating judges consider the current programs effective in providing legal research tools for legal texts and judicial jurisprudence; however, the real problem lies in researching legal doctrine, as the Jordanian judge lacks tools for research in legal doctrine, which they stated they need in some complex cases, though not in every case (Ps 1; 2; 3; 5; 6; 8; 15). By contrast, others found that legal doctrine is available digitally through the internet and did not face a problem in that regard (Ps 4; 7). Two judges stated that there is a challenge in providing tools for researching legal doctrine because some of those research platforms require special monthly subscriptions that are not currently provided to judges (Ps 9; 13).

One judge pointed to what is missing in the legal research tools he relies on for searching judicial precedents, stating: "You can easily search for a law, or a statutory provision, or a judicial decision that speaks generally about a provision or a legal template for an offence. But the circumstances or constraints that should narrow this search, I do not think there are search engines with enough intelligence to get you to what you want quickly; this needs more research. The results that search engines may give you are linked to the word or the legal text you request. So, for example, if it is an

offence related to unlawful access, search engines may give you a large number of judicial precedents related to that offence, but you are forced to search through all of them until you reach a factual or legal situation similar to your situation in a certain respect, the one you are looking for, because the search engine now, I do not think, can satisfy your request by giving you a precise search result that you are asking for." (P14)

This was confirmed by a number of judges, who stated that these tools do not provide direct results that match what judges are searching for; rather, a subsequent filtering stage is necessary, carried out by the judge, to refine the results produced by these tools based on search keywords (P3, P4, P6, P13). A judge may sometimes sift through 20 to 30 search results to reach the legal point he seeks (P13).

One judge distinguished between civil and criminal cases in relation to the legal research challenge, indicating that the greater challenge exists in civil cases because the laws governing those cases are more fragmented (P16). One judge also noted that the currently applied search engines may not display newly issued legal texts and judicial precedents, and that the appearance of recent decisions may take weeks from the date of issuance before other judges can access them (P12). The same judge indicated that the current programs do not support the idea of providing alerts to the judge that the case he is hearing has already been the subject of prior judicial decisions on the same matter, expressing the need to provide this feature with a focus on Court of Appeal decisions rather than Court of Cassation decisions, given that Courts of Appeal are in constant contact with courts of first instance, unlike the Court of Cassation, to which most judgments are not appealed (P12).

One judge indicated that some judges have begun using certain AI programs, such as ChatGPT, as a means of researching legal doctrine and summarizing legal research (P7). one judge suggested the need to provide an electronic tool capable of automatically suggesting the legal texts and judicial precedents related to the subject of the case to the judge, given its role in drawing the judge's attention to texts that the judge may have overlooked, so that the judge himself can then examine these suggestions in detail (P9).

One judge stated that his prior service in the technical office of the Court of Cassation, which is concerned with legal research, provided him with extensive experience in researching legal doctrine (P2). One judge expressed that he sometimes consults fellow judges to search for judicial precedents on certain issues, indicating that he asks some colleagues about prior judicial decisions, as they may be more familiar than he is with those precedents (P16). Another judge suggested that the idea of technical offices applied in the Courts of Appeal and the Court of Cassation be generalized to courts of first instance, to provide legal research tools supported by the human element (P1).

Analytical summary: The findings show that legal research tools have developed gradually for Jordanian judges, and that the current tools rely on private programs that provide search features for legal texts and judicial precedents in Jordan, as well as some comparative case law. At present, these

tools are centred around the Qistas program, which has begun a comprehensive development process to incorporate AI features into its services. The annual reports issued by the JJC did not identify judges' legal research as a distinct challenge. This may partly reflect the fact that legal research is embedded in judges' day-to-day professional work and may therefore be less visible in aggregate institutional reporting. The interview findings indicate that the challenges vary both among judges and according to the type of legal research undertaken. Most participants expressed general satisfaction with the existing tools for accessing legislation and judicial precedents, suggesting that the principal issue is not the absence of such tools but their remaining limitations. Participants identified scope for greater precision in search results, more effective filtering, faster access to recent materials, and functions capable of drawing judges' attention to potentially relevant legal provisions or precedents. A more significant gap emerged in relation to legal doctrine, for which several participants reported more limited access and research support.

2.4 Chapter Conclusion

The findings of this chapter demonstrate that judicial workload in Jordan cannot be understood solely by reference to the number of cases received by the courts. Although the caseload handled by individual judges remains substantial, the interviews show that workload also depends on total/active caseload, case complexity, judicial specialisation, geographical location, and the range of tasks performed by judges. At the same time, the available official statistics primarily measure case volumes and disposition rates and provide more limited information concerning case weight and the distribution of judges' time across different judicial activities.

Decision-writing emerged as a particularly time-intensive component of judicial work. The literature, official reports, and interview findings indicate that judges devote significant time not only to legal reasoning and the evaluation of evidence, but also to preparing formal, descriptive, and procedural elements of judgments. The interviews reveal an important distinction between these routine drafting elements and the core judicial functions of establishing the relevant facts, evaluating evidence, applying the law, and providing reasons for the decision. This distinction identifies decision-writing as an area in which different forms of support may warrant further examination, while responsibility for substantive judicial reasoning must remain with the judge.

Legal research constitutes another significant component of judicial workload, although the nature of the challenge varies according to the type of material being researched. The findings indicate that existing digital tools provide relatively effective access to legislation and substantial assistance in locating judicial precedents, while greater difficulties remain in relation to legal doctrine, the precision and filtering of search results, the availability of recent materials, and the time required to identify sources that are directly relevant to the facts and legal issues of a particular case. The interview evidence

therefore points less to an absence of legal research tools than to limitations in the depth, precision, integration, and range of the support currently available.

Taken together, the findings identify three interrelated dimensions of judicial workload relevant to the judicial decision-making process: the volume and composition of cases allocated to judges, the time required for decision-writing, and the effort involved in legal research. They also identify particular judicial tasks in which additional support may potentially reduce demands on judges' time and allow greater attention to functions requiring substantive legal judgment.

3. Quality Challenges in Judicial Decision-Making in Jordan

The level of quality of the judicial decision constitutes one of the most important indicators of the efficiency and effectiveness of the judicial system as a whole. It is not sufficient for a dispute to be adjudicated unless the resulting judgment is based on sound legal and factual grounds and is supported by adequate reasoning that enables the litigants and the appellate court to discern its justifications. Accordingly, the challenges connected to the quality of the judicial decision are no less serious than the challenges associated with judicial workload and volume of work; indeed, they often represent the other side of the same coin, as case pressure and the accumulation of files may directly affect the degree of care a judge devotes to reasoning the judgment.

In this context, this chapter addresses the challenges surrounding the quality of the judicial decision in the Jordanian judicial system. It does so by setting out the theoretical framework of the concept of judicial decision quality and its criteria, while also presenting the manifestations of shortcomings in this quality in practice as reflected in the judgments of the Court of Cassation. The chapter then proceeds to analyse the most prominent reasons that affect the quality of the Jordanian judicial decision and subsequently presents the results of what the interviewed judges disclosed by way of observations in this regard. This chapter also includes a separate section examining expert evidence as one of the factors affecting the quality of judicial judgments in Jordan, and this issue has been addressed in an independent section due to the need for further detail and analysis, and to present the interview findings relating to the challenges judges face in dealing with expert evidence.

3.1 Judicial Decision Quality in Jordan: Concept and Practice

The judicial decision is the principal product of adjudication and a central expression of the judicial function. Its quality is therefore an important indicator of the effectiveness of judicial work.

European institutional guidance demonstrates that judicial quality cannot be assessed through a single fixed approach. The CEPEJ, in its *Guide on Measuring the Quality of Justice*, describes quality as a broad concept that cannot be reduced to one technique or methodology and distinguishes the broader concept of the quality of justice from the narrower concept of the quality of judicial decisions.[56] The CCJE, in Opinion No. 11 (2008), similarly recognises considerable diversity among states in the methods used to assess and improve the quality of judicial decisions.[57] Likewise, comparative approaches such as the EU Justice Scoreboard confirm that there is no single method for measuring the quality of justice systems.[58]

[56] CEPEJ 2017, p. 8.
[57] CCJE 2008, para. 8.
[58] European Commission 2024, EU Justice Scoreboard 2024, p. 22.

For the purposes of this study, the analysis adopts the narrower focus on the quality of the judicial decision itself. Judicial decision quality is examined through three interrelated dimensions: the formal characteristics of the written decision, the procedural conditions under which it is produced, and its substantive legal and factual quality. This approach is consistent with the CCJE's view that a high-quality decision should reach a correct outcome to the extent permitted by the material before the judge and should be achieved with fairness, speed, clarity, and finality.[59]

The **formal dimension** concerns compliance with the legally required elements of the judgment, including the proper identification of the court and the parties, an adequate account of the procedural history, and a clear operative part. The **procedural dimension** concerns the conditions under which the decision is produced, including respect for defence rights, publicity of hearings, the adversarial principle, and timely adjudication. These safeguards contribute to the integrity of the arguments and evidence upon which the final decision is based. The **substantive dimension** concerns the legal and factual reasoning contained in the decision. It includes understanding the parties' arguments, examining and weighing evidence, identifying and interpreting the applicable legal rules, maintaining consistency with relevant legal principles, and correctly applying the law to the established facts. For the purposes of this study, particular emphasis is placed on substantive quality because it directly concerns the court's resolution of the dispute according to law.

Assessing substantive quality is more difficult than examining compliance with formal requirements because it involves several interconnected legal and factual elements that cannot easily be reduced to numerical indicators. The JJC's annual reports, for example, use the rate at which higher courts uphold lower-court judgments as an indicator of decision quality. The 2024 Annual Report records a quality rate of 66% for judgments of courts of first instance under this approach.[60] However, affirmation rates provide only a limited indicator and cannot, by themselves, offer a comprehensive assessment of judicial decision quality. A judgment may be reversed because of a legitimate difference in legal interpretation rather than an obvious judicial error. A lower court's position may also subsequently be confirmed by the Court of Cassation after being rejected by an appellate court, and the Court of Cassation itself may later depart from an earlier legal position.[61] Moreover, judgments that are not appealed are excluded entirely from such an assessment, while affirmation rates do not reflect other dimensions of quality, such as the time required to adjudicate the case.

A more comprehensive mechanism used by the JJC is judicial inspection. The Judicial Inspection Department annually evaluates sitting judges by examining a selection of their cases. This assessment covers elements such as the proper application of law, completion of litigation and evidentiary

[59] CCJE 2008, para. 3.
[60] Jordanian Judicial Council 2024, p. 9.
[61] This is one of the situations in which the General Assembly of the Court of Cassation convenes, namely when the Court departs from a previous precedent; see Hashemite Kingdom of Jordan 2001 (as amended), Law on the Establishment of Regular Courts No. 17 of 2001, Art. 9.

procedures, reasons for adjournment, time taken to resolve cases, adequacy of reasoning and justification, soundness of the conclusions reached, and the judge's annual disposal rate.[62] This approach therefore permits closer examination of the formal, procedural, and substantive dimensions of judicial work.

Nevertheless, judicial inspection reports are primarily designed for the individual administrative evaluation of judges, particularly for purposes related to judicial career progression. They are confidential and are not published or generally available to researchers.[63] This study therefore recommends that anonymised findings derived from judicial inspection be used, in addition to individual evaluation, to identify recurring patterns of strengths and deficiencies in judicial decisions without disclosing the identity of individual judges. Aggregated findings could also be incorporated into the JJC's annual reporting to provide a broader assessment of judicial decision quality than affirmation rates alone.[64]

This approach is consistent with CEPEJ guidance on evaluating the quality of judges' work. In relation to judicial decisions, the CEPEJ recommends examining written skills, the quality of legal reasoning, the type and complexity of cases, and success rates on appeal together with the reasons for reversal or modification. It therefore emphasises the importance of analysing why a judgment has been reversed rather than treating reversal as a purely numerical indicator. The guidance also considers workload, case-processing time, the number of hearings, judicial performance during hearings, and compliance with professional and ethical standards. It further recognises the possible use of external sources in evaluation, including court staff and appropriately qualified advisory members from outside the judiciary.[65]

Accordingly, this study does not rely primarily on affirmation rates to determine the quality of Jordanian judicial decisions. In the absence of comprehensive empirical studies or publicly available institutional assessments, it draws on decisions of the higher courts, particularly the Jordanian Court of Cassation, official reports, and interviews with Jordanian judges. Future statistical and legal studies based on decisions of the Court of Cassation and courts of appeal would nevertheless be valuable in identifying the frequency and distribution of different grounds for reversal and the variables associated with them.

The following discussion therefore does not seek to provide an exhaustive or statistical classification of deficiencies in Jordanian judicial decisions. Rather, based on the Court of Cassation decisions reviewed for this study, it identifies several manifestations that appeared repeatedly within the Court of Cassation decisions reviewed and that are particularly relevant to judicial decision quality.

[62] Hashemite Kingdom of Jordan 2015 (as amended), Judicial Inspection Regulation No. 43 of 2015, Art. 4(2).
[63] Hashemite Kingdom of Jordan 2015 (as amended), Judicial Inspection Regulation No. 43 of 2015, Art. 5.
[64] Rascão 2022, p. 64.
[65] CEPEJ 2024, Guidelines on the evaluation of the quality of work of judges, pp. 7–8, 12–13.

First: Legal Qualification of the Facts. Legal qualification is the process through which the judge determines the appropriate legal classification of the established facts and brings them within the scope of the applicable legal rule, after analysing their nature, elements, and constituent components.[66] For example, the judge may be required to determine whether a particular relationship constitutes employment or independent contracting, whether an agreement is a sale or lease, or whether established conduct amounts to theft or breach of trust. Legal qualification is therefore a demanding judicial task because it requires a combined understanding of both the established facts and the applicable law. Closely related legal classifications may also depend on subtle distinctions that require careful judicial analysis.[67]

A review of Jordanian Court of Cassation decisions reveals instances in which lower-court decisions were found defective because of errors in legal qualification. As a general rule, the Court of Cassation is a court of law rather than a court of fact; while establishing the facts principally belongs to the trial courts, the legal qualification given to those facts remains subject to cassation review.[68] The Court of Cassation has accordingly affirmed that the legal description advanced by the parties does not bind the judge and that correctly qualifying the dispute is a judicial task because it determines the legal rule that should be applied.[69]

Second: Insufficiency of Reasoning and Justification. This deficiency arises where the factual or legal reasons supporting a judgment are incomplete, unclear, contradictory, or otherwise insufficient to explain the basis upon which the court reached its conclusion and to permit effective appellate review. Giving reasons also operates as an important safeguard against arbitrary decision-making.[70] The Court of Cassation decisions reviewed for this study repeatedly address deficiencies such as failure to explain the facts and evidence relied upon, failure to address essential arguments, contradictions within the reasoning, or inconsistency between the reasons and the operative part of the judgment.[71] The appearance of similar deficiencies in decisions from different years indicates that such problems have arisen on more than an isolated occasion, although the reviewed decisions do not permit an assessment of their prevalence across Jordanian judgments generally.

Third: Premature Adjudication. This occurs where a court decides a case before resolving a preliminary or essential matter necessary for determining the dispute. Examples found in the Court of

[66] Al-Sharif 2024, p. 283.
[67] Al-Sharif 2024, p. 290.
[68] Regarding the situations in which an appeal by cassation is permitted, see Hashemite Kingdom of Jordan 1988 (as amended), Code of Civil Procedure No. 24 of 1988, Art. 198.
[69] Al-Sharif 2024, p. 289; see also Court of Cassation (Jordan) 2010, Civil Cassation Judgment No. 877/2010; Court of Cassation (Jordan) 2010, Civil Cassation Judgment No. 2272/2010.
[70] CCJE Opinion No. 11 (2008), para. 35.
[71] Court of Cassation (Jordan) 1987, Criminal Cassation Decision No. 4/1987; Court of Cassation (Jordan) 1958, Civil Cassation Decision No. 149/1958; Court of Cassation (Jordan) 1995, Criminal Cassation Decision No. 481/1995; Court of Cassation (Jordan) 2009, Civil Cassation Decision No. 2055/2009; Court of Cassation (Jordan) 2025, Civil Cassation Decision No. 2782/2025.

Cassation decisions reviewed include adjudicating before verifying whether another relevant judgment has become final, before examining a party where such examination is necessary, or before verifying evidence concerning matters of public order.[72] Such omissions may undermine the factual or procedural basis upon which the final decision is made.

Fourth: Inconsistency with Established Court of Cassation Jurisprudence. Another issue concerns decisions that depart from established positions of the General Assembly of the Court of Cassation on questions for which legislation does not provide a clear answer. Statutory provisions necessarily take priority over judicial precedent, and the jurisprudence of the General Assembly is not formally binding on judges. Nevertheless, it serves as an important reference for promoting consistency and stability in the interpretation and application of law. Unexplained divergence from established jurisprudence may therefore affect the consistency of judicial decision-making.

Fifth: Deficiencies Relating to Expert Evidence. Court of Cassation decisions also reveal recurring deficiencies concerning technical expert evidence. These include failure to obtain expert evidence where it was legally or technically necessary, incorrectly defining the expert's task, relying on reports that do not satisfy legal requirements, and failing to comply with procedural requirements governing expert work. Given the particular importance and complexity of expert evidence and its relationship with judicial decision quality, these challenges are examined separately in Section 3.3.

Sixth: Other Errors in the Application of Law. Court of Cassation decisions also identify broader errors in applying the law, including applying an inappropriate legal provision or overlooking a provision more directly applicable to the dispute. This category necessarily overlaps to some extent with the manifestations discussed above, since incorrect legal qualification, insufficient reasoning, premature adjudication, and deficiencies in expert procedures may themselves involve failures to apply legal rules correctly.[73] It is therefore best understood as a residual category covering legal errors that do not fall clearly within the more specific manifestations identified above.

3.2 Factors Affecting the Quality of Judicial Decisions

The previous section identified several manifestations of deficiencies in the quality of judicial decisions in Jordan. This section examines some of the principal factors that may affect judicial decision quality, drawing on relevant literature, official reports, and the views of the Jordanian judges interviewed for this study.

[72] Court of Cassation (Jordan) 2024, Civil Cassation Judgment No. 1959/2024; Court of Cassation (Jordan) 2024, Civil Cassation Judgment No. 4643/2024; Court of Cassation (Jordan) 2024, Civil Cassation Judgment No. 3396/2024.
[73] Court of Cassation (Jordan) 2024, Civil Cassation Decision No. 36/2024; Court of Cassation (Jordan) 2021, Civil Cassation Decision No. 9421/2021.

3.2.1 Judicial Workload

The previous chapter demonstrated the scale of the workload borne by Jordanian judges. While that analysis focused primarily on the volume of judicial work, the present section examines its potential impact on the quality of judicial decisions. Judicial work has been compared to a gas that expands to fill the time available: as workload increases, judges face greater pressure to dispose of cases, whereas a lower workload may allow more time for examining files, considering evidence, conducting legal research, and providing fuller reasoning.[74] Judicial work is therefore often not confined to official court hours, as judges may need to review cases and prepare decisions outside the courtroom.[75]

The relationship between efficiency and judicial quality has also become relevant in the context of what has been described as "new judicial management", which introduces managerial techniques, performance indicators, and efficiency objectives into court administration.[76] Such approaches may improve organisation and clarify institutional needs, but excessive reliance on numerical productivity indicators may also create unintended effects. Studies from European jurisdictions have reported judicial resistance to treating courts in purely managerial terms and have cautioned that production-based indicators may encourage attention to simpler cases at the expense of more complex ones.[77] Similarly, Flynn's Australian study warned that reforms designed to increase court efficiency may, in some circumstances, prioritise efficiency gains over other interests of justice.[78]

Comparative research involving judges in Finland, Italy, and the Netherlands further illustrates the relationship between workload and judicial quality. Judges in those jurisdictions reported substantial work pressure, which affected the time available to study cases and, in some instances, encouraged simplified reasoning in order to distribute limited time across a larger number of cases.[79] The study reported approximately 100 cases annually for Finnish judges, around 360 criminal cases for Dutch judges, and approximately 250 criminal cases for Italian judges.[80] Although direct numerical comparison between different judicial systems should be

[74] Viapiana, van Dijk and Diephuis 2023, p. S357.
[75] Viapiana, van Dijk and Diephuis 2023, p. S357.
[76] Viapiana, van Dijk and Diephuis 2023, p. S350.
[77] Viapiana, van Dijk and Diephuis 2023, p. S350.
[78] Flynn 2009, p. 244.
[79] Viapiana, van Dijk and Diephuis 2023, p. S365.
[80] Viapiana, van Dijk and Diephuis 2023, pp. S364–S365.

approached cautiously because of differences in jurisdiction, case type, and methods of calculation, the figures nevertheless provide useful context for the workload reported in Jordan.

In Jordan, the Judicial Council reported an average caseload of approximately 618 cases per judge in 2024. This figure is itself an approximation and may not reflect the actual workload of judges in particular courts. Some interviewed judges reported caseloads approaching 100 cases per month. The available figures therefore illustrate the considerable volume of work handled by Jordanian judges, although they should not be treated as directly equivalent to workload figures from other jurisdictions.

The interviews identified several mechanisms through which workload may constrain the time and effort available for judicial work. Most participants reported that workload could affect the overall quality of judicial performance (P1, P3, P4, P5, P6, P7, P9, P11, P12, P13, P14, P15, P16, P17 and P18). Judges referred particularly to its effect on the time available to examine facts, hear witnesses, evaluate evidence, conduct legal research, and prepare decisions. A public prosecutor explained:

“If the number of cases were less … I would be able to give each case its due, carry out the investigation fully while I am comfortable, gather all its evidence, and then issue my decision in it. But with this large number, I practically cannot give every case its full due in terms of investigation.” (P13) Workload was also linked to the conduct of proceedings themselves. One judge stated: “For example, in a day I may hear 40 sessions, so I do not have enough time to clarify from people as much as possible, except to focus on the essential issues in their cases.” (P3) Another participant emphasised that deficiencies occurring before the judgment may ultimately affect the quality of the judicial decision:

“The sequence of procedures itself is not in an ideal state, because you are forced not to give every case its full due. And when there is a certain defect in the sequence of procedures, even if unintended, this ultimately reflects on the quality of judicial work as a whole.” (P9)

The effect may also extend to substantive legal analysis. One judge gave a particularly relevant example: “Sometimes, we overlook certain legal characterizations of offences within the same case, even among the simplest offences, because of work pressure and the workload placed on us.” (P16) Similarly, another participant linked workload directly to the scope of legal research:

"The more the judicial workload increases, the less time is available to study each file adequately, and this affects the quality of the decision and may deprive the judge of expanding recourse to settled judgments, doctrine, and books. As a result, the judge is sometimes forced to decide quickly in order to handle the large number of incoming requests." (P17)

The findings were not entirely uniform. Some participants did not consider workload to have a direct effect on the quality or fairness of their decisions, explaining that judges may compensate by working longer hours and exerting additional effort (P2 and P10). (P1) also noted that judges may compensate for increased workload through additional time and effort:

"We try to compensate for the increased volume by increasing the time we spend on cases; most of our time is spent on cases so that we try to make up for it … But in general, there is no doubt that such an increase in volume may lead to a reduction in the quality of judgments, although, in my view, it will not necessarily be reflected in the fairness of the outcome."

Overall, the findings identify judicial workload as a prominent factor that may affect decision quality by reducing the time available for factual examination, evidential assessment, legal research, and judicial reasoning. Reducing or better distributing workload may therefore create greater space for judges to engage more deeply with individual cases, although workload should not be treated as the sole determinant of judicial quality.

3.2.2 Complexity of Modern Disputes

Changes in social and technological conditions are increasingly reflected in the nature of disputes brought before courts. Criminal proceedings now include cybercrime and traditional offences committed through digital means, while civil litigation increasingly involves matters such as e-commerce, digital assets, blockchain, and intellectual property in the digital environment. The forms of evidence used in such disputes have similarly expanded to include digital records, geolocation information, electronic communications, and other forms of technical evidence.[81]

These developments have created fields of knowledge that may fall outside the traditional legal education and professional preparation of judges. The increasing use of judicial specialisation

[81] Council of Europe 2019, p. 13.

itself reflects the growing complexity of particular categories of disputes and the additional knowledge required to adjudicate them effectively.

The Council of Europe Guidelines on electronic evidence in civil and administrative proceedings recognise the increasing diversity and procedural complexity of electronic evidence and emphasise the importance of specialised training.[82] Studies similarly suggest that the proper assessment of digital evidence requires at least a basic understanding of relevant technologies and the risks of manipulation or misinterpretation. As Kessler observed, appropriate training may enable judges to "better understand the arguments presented by lawyers [and] testimony offered by technical witnesses."[83] A lack of sufficient technical understanding may therefore affect the court's ability to assess evidence and, in technically complex cases, may raise broader concerns relating to procedural fairness.[84]

Modern disputes may consequently require judges to devote additional time and effort to understanding unfamiliar subject matter and assessing the probative value of specialised or digital evidence. The JJC has similarly emphasised in its annual reports the need to strengthen judicial capacity in fields including money laundering, trafficking in persons, and cybercrime, and to ensure the availability of appropriately trained judges.[85]

The interviews broadly confirmed this challenge. Most participants who had encountered modern disputes described difficulties associated with their technical or technological dimensions. P9 summarised the problem as a growing gap between traditional legal preparation and contemporary technological developments:

"We are now going through a phase of 'contemporary judicial disputes.' … The enormous technological development, whether in the context of electronic contracts or the means of committing crime, has sometimes led to a gap between the human capabilities of those working in the legal field … and these modern technological means."

The participant added that this development requires additional judicial time and effort simply to acquire a sufficient understanding of the features of such disputes (P9). P1 drew a distinction between criminal and civil disputes. In criminal matters, the principle of legality requires

[82] Council of Europe 2019, p. 27.
[83] Kessler 2011, p. 67.
[84] Custers 2024, p. 1,
[85] Jordanian Judicial Council 2022, p. 98.

technological developments in criminal conduct to be addressed through legislation, and the participant considered that Jordanian criminal legislation had responded to many such developments. Civil disputes, however, were regarded as potentially broader because legislation cannot necessarily anticipate every new form of private transaction. A public prosecutor provided a concrete example concerning AI-generated evidence: "Among the examples I see today are AI applications in editing and merging images: a person gives the program an image and asks it to modify it or generate an image in a certain way. The experts we have today often do not have the capacity to tell me: is this image real, or originally fabricated by AI?" (P13)

Judges described different methods of dealing with unfamiliar disputes. Some viewed expert evidence as an important means of obtaining the technical knowledge required by the court (P3, P5 and P6). Others reported consulting university academics, law offices, judicial precedents, and specialised legal literature when confronted with unfamiliar legal or technical questions (P16 and P18). By contrast, judges working primarily in more traditional areas of litigation reported encountering this challenge less frequently (P7).

Overall, the findings suggest that the growing technical and technological complexity of disputes creates additional demands on Jordanian judges, particularly in understanding unfamiliar subject matter and evaluating specialised or digital evidence. The challenge is therefore not that judges must become technical experts themselves, but that they require sufficient knowledge, training, and access to reliable sources of support to understand and evaluate the issues necessary for judicial decision-making.

3.2.3 Digital Tools and the Judicial Digital Environment

The quality and efficiency of judicial work are increasingly connected to the technological environment in which judges operate. Modern judicial work requires not only electronic management of case files but also timely access to legislation, judicial precedents, and other legal sources. European guidance recognises that information and communication technologies may contribute to judicial quality where they improve access to reliable legal information and facilitate judicial work.[86] Velicogna and Bogdani similarly concluded that "if properly used,

[86] CCJE 2011, Opinion No. 14, para. 27.

ICT can be a powerful tool to increase transparency, court efficiency, and the quality of services delivered by the courts."[87]

The usefulness of the digital environment, however, depends on the availability, completeness, and searchability of its resources. Where legal databases are incomplete, insufficiently updated, or difficult to search, judges may spend additional time locating relevant legislation and precedents. Limited search capabilities may also increase the risk of relying on easily accessible authorities without sufficiently determining whether they represent the most recent or relevant legal position. Digital support may therefore affect not only efficiency but also the judge's ability to conduct comprehensive legal research.

Jordanian courts already use several technological systems. The principal example is "Mizan", an electronic case-management system first introduced in 2005 and used across different levels and types of courts. It supports the management of the case file from registration to judgment, including electronic records, documents, notifications, witness and expert summonses, and links with other public institutions.[88] Its principal function, however, remains case and procedural management rather than substantive support for judicial decision-making.

The interview findings show considerable appreciation of the progress achieved through judicial digitalisation. P2 explained that existing systems had: "… helped greatly in some matters: reducing paper, reducing the burden of people having to attend the courts, and reducing the time wasted searching for a file or for a specific piece of information. So, they are effective systems, but they require continuous development, and they also require intensive training for users."

P7 similarly referred to developments in the Mizan system, particularly electronic submissions and electronic signatures, explaining that the electronic exchange of submissions had:

"… facilitated and shortened a great deal of time in hearings; instead of lawyers appearing before you directly, they now exchange submissions electronically from their offices, and in the end the case file reaches the judge with the submissions complete, so that he can issue his decision…"

[87] Velicogna and Bogdani 2017, p. 1.
[88] Ministry of Justice (Jordan) n.d., Computerization of Court Work.

Nevertheless, some participants reported continuing technical difficulties, including slowness, temporary freezing, and interruptions in the Mizan system (P3, P15 and P16). Others called for stronger electronic integration between courts and other state institutions to reduce time spent on official correspondence (P6). P8 proposed the introduction of speech-to-text technology to record courtroom proceedings directly, thereby reducing dependence on manual transcription.

These examples primarily concern procedural and administrative digital support. The interviews also indicate a distinction between such tools and substantive decision-support tools. Most systems currently available to Jordanian judges are designed to manage files and court procedures rather than to assist directly with activities such as advanced legal research, analysing large case files, identifying relevant authorities, or summarising complex materials. With the exception of legal research services such as Qistas, participants generally did not identify specialised digital systems designed specifically to support the substantive stages of judicial decision-making (P2, P3, P4, P5, P9, P11, P12 and P13).

Overall, Jordan has made significant progress in the digital management of court proceedings, particularly through electronic case management, filing, communication, and related procedural services. However, the findings indicate a continuing distinction between the digitalisation of court administration and the development of digital tools that directly support judicial analysis and decision-making. This distinction is particularly relevant in light of the workload and complexity challenges identified above and provides a basis for examining, in later chapters, whether more advanced technologies can support judges in particular judicial tasks while preserving the judicial nature of the decision-making function.

3.3 Expert Evidence and Judicial Decision Quality

Expert evidence plays an important role in technically complex disputes where judicial fact-finding depends on specialised knowledge beyond the court's ordinary experience. Experts therefore connect scientific, professional, and technical knowledge with legal decision-making. However, reliance on expert evidence also creates procedural and practical difficulties concerning how such evidence is produced, presented, tested, and evaluated by the court.

This section first examines the role and duties of expert witnesses, their independence, methodological transparency, and responsibility to assist the court rather than advance a party's

position. It then analyses the principal challenges affecting expert evidence. The discussion also incorporates findings from interviews with Jordanian judges to connect the legal framework with judicial practice.

3.3.1 The Concept, Role, and Duties of Expert Witnesses

An expert may be defined as a person who has a defined level of expertise in their chosen field of study, achieved through education, training, skill, or experience, and possesses knowledge beyond that of the typical person.[89] Expertise therefore refers to specialised knowledge that exceeds the ordinary knowledge of the court. It may be demonstrated through formal qualifications, professional training, practical experience, or a combination of these. The court is primarily concerned with the existence and relevance of the claimed expertise rather than the particular manner in which it was acquired.[90] In civil proceedings, Article 83(3) of the Jordanian Code of Civil Procedure sets out several central requirements governing expert work. It requires the expert to possess the scientific, technical, professional, or practical competence necessary to perform the assigned task and to act impartially, truthfully, and honestly. The expert must also disclose any circumstances that may reasonably raise doubts concerning independence or impartiality in relation to the parties, their representatives, or the court. Failure to make an accurate disclosure may result in the invalidation of the report and the recovery of the fees paid to the expert.[91]

Comparative case law also provides useful illustrations of how courts in other jurisdictions have approached questions of expert qualification and the evaluation of expert evidence. For example, in *R v Silverlock*, Vaughan Williams stated, "No one should be allowed to give evidence as an expert unless his profession or course of study gives him more opportunity of judging than other people".[92] Ultimately, determining whether a person possesses the necessary expertise falls within the discretion of the court. Where a party introduces an expert, that party must establish that the expert has the appropriate qualifications or experience in the relevant field.[93]

Specialised knowledge is useful only when it is communicated clearly. An expert must therefore be capable of explaining technical matters in a manner that enables the judge and the parties to understand and critically examine the opinion.[94] This explanation may be provided in the written report or during oral examination. The report should clearly identify the facts and evidence relied upon, the methodology applied, and the reasoning leading to its conclusions. The Jordanian Court of Cassation has affirmed

[89] Speight 2008, p. 2.
[90] Law Reform Commission 2008, p. 139.
[91] Hashemite Kingdom of Jordan 1988 (as amended), Code of Civil Procedure No. 24 of 1988, Art. 83(3).
[92] R v Silverlock [1894] 2 QB 766, 769. See also Law Reform Commission 2008, p. 139.
[93] A'yun 2014, p. 352. See also: Law Reform Commission 2008, p. 146.
[94] See Rockwater Ltd v Technip France SA & Anor [2004] EWCA Civ 381, para. 12; see also Furst 1997, p. 8.

that an expert report should not be accepted unless the expert explains the basis on which its conclusions were reached.[95] Such transparency allows the parties to challenge the opinion and enables the court to assess its reliability rather than merely accept its conclusions.

The principal role of expert evidence is to assist the court in understanding scientific, technical, or professional matters that fall outside ordinary judicial knowledge.[96] Judges are not expected to possess extensive expertise in every technical field. Even where a judge has relevant personal knowledge, relying on information outside the case record may deprive the parties of the opportunity to examine and challenge it. Judicial specialisation may provide judges with greater familiarity with the technical context of particular disputes and may sometimes reduce the extent of expert assistance required.[97] However, a distinction should be maintained between legal specialisation, which the judge may properly apply, and personal technical knowledge that has not been introduced and tested within the proceedings. Where determining a disputed fact requires specialised analysis beyond ordinary judicial knowledge, expert assistance remains required.

The contribution of experts varies according to the nature of the case. In criminal proceedings, experts may analyse fingerprints, DNA, blood samples, firearms, or other forensic evidence. In civil disputes, they may assess damages, determine the value of property, or estimate depreciation following an accident. Courts generally do not appoint experts to determine questions of domestic law, since the interpretation and application of the law remain judicial functions, although expert assistance may sometimes be used in relation to foreign law.[98] Experts may strengthen the case of the party relying on them, but courts generally confine expert evidence to what is necessary to resolve the dispute, an approach affirmed by the Jordanian Court of Cassation.[99]

In addition to competence and independence, experts are subject to several procedural duties. Their opinions should be based on the facts and evidence available in the proceedings and should not rely on undisclosed external information.[100] Experts may consult scientific literature or other specialists, provided that such consultation is disclosed where appropriate and the resulting analysis remains connected to the case evidence. They must complete their work within the prescribed period, take the required legal oath, provide reasons rather than unsupported conclusions, and attend hearings when summoned to explain or defend their reports.[101] As the UK Supreme Court stated in *Kennedy v Cordia*

[95] Court of Cassation (Jordan) 2022, Civil Cassation Decision No. 2401/2022 (General Assembly).
[96] Dillon 2018, p. 255.
[97] Radley-Gardner 2022, paras. 6–8.
[98] Radley-Gardner 2022, paras. 6–8.
[99] Katz 2014, p. 6; see also Lewis Silkin LLP 2025, p. 15; Court of Cassation (Jordan) 2009, Civil Cassation Decision No. 2910/2009.
[100] See also Kuchler 2010, p. 160.
[101] Hashemite Kingdom of Jordan 1988 (as amended), arts. 83(3), 84(7), 85(2), 86(1), (3).

LLP, "An expert must explain the basis of his or her evidence".[102] These duties ensure that expert evidence remains transparent, contestable, and capable of meaningful judicial evaluation.

3.3.2 Current Challenges in Expert Evidence

In the Jordanian judicial context, reliance on expert evidence presents several practical challenges that may affect both the reliability of judicial fact-finding and the efficiency of proceedings. These challenges concern not only the competence of experts, but also the court's ability to evaluate technical opinions, the cost and duration of expert procedures, and the risk of bias. The following discussion examines the principal difficulties associated with expert evidence before turning to the findings of the interviews with Jordanian judges.

3.3.2.1 Reliability and Judicial Evaluation of Expert Evidence

The reliability of expert evidence depends substantially on the expert's knowledge, experience, and ability to remain familiar with developments in the relevant scientific or technical field. The quality of expertise may therefore vary considerably between experts, particularly where access to reliable and up-to-date professional knowledge is limited. Moreover, because expert opinions frequently depend on individual knowledge and professional judgement, different experts may reach different conclusions in similar cases. Such differences may affect the consistency and predictability of judicial outcomes.

A related difficulty concerns the court's ability to assess the reliability of expert work. Judges must examine the expert's qualifications and assess the relevance and reliability of the opinion and the extent to which it assists the court.[103] The Jordanian Court of Cassation has emphasised that judicial supervision of expert proceedings must be substantive rather than formal. Courts should therefore consider the experts' competence, professional knowledge, seriousness, and actual contribution to the report when selecting experts and assessing their work.[104]

This task becomes particularly difficult where the expert opinion depends on complex scientific methods or competing technical theories. Judges may not possess sufficient scientific knowledge to identify methodological weaknesses, outdated assumptions, or inaccuracies in the expert's reasoning. In such circumstances, there is a risk that assessment may be influenced by non-technical considerations, such as the expert's credibility or presentation skills, particularly where competing

[102] Kennedy v Cordia (Services) LLP [2016] UKSC 6, para. 48.
[103] Katz 2014, p. 6.
[104] Court of Cassation (Jordan) 2018, Civil Cassation Decision No. 1032/2018.

experts reach conflicting conclusions.[105] A different comparative example is provided by the Daubert framework in the United States, which concerns the judicial evaluation of scientific expert evidence. Experience under this framework illustrates the broader difficulty legally trained judges may face when assessing specialised scientific methodology.[106]

It has been suggested that scientifically trained judges could reduce this difficulty.[107] However, this solution appears difficult to implement in practice because modern scientific and technological knowledge is increasingly specialised. Similarly, Custers argues that judges dealing with technologically complex disputes require at least a basic understanding of the relevant technology, while recognising that it is unrealistic to provide every judge with deep expertise across multiple technical fields. Judicial training and specialisation may therefore assist, but they cannot by themselves eliminate the difficulty of evaluating complex expert evidence. Institutional and procedural forms of support remain necessary.[108]

3.3.2.2 The Cost of Expert Evidence

Expert evidence may also impose a significant financial burden on litigants and, in some circumstances, on public resources. Experts are compensated for the specialised time and work required to examine the materials, conduct the necessary analysis, and prepare their reports. The cost is generally borne by the party requesting the expertise, although publicly funded expert assistance may arise in certain circumstances where expert input is required by the court.

The financial impact may become particularly significant in technically complex disputes requiring specialised or multiple experts.[109] In some cases, expert fees may be disproportionate to the value of the dispute itself. This may discourage parties from seeking necessary expert assistance or from effectively challenging the expert evidence presented by the opposing party.[110] Expert costs may therefore operate as a practical barrier to access to justice and to the effective examination of technical issues.

3.3.2.3 Delays in Expert Proceedings

Timely adjudication is an important element of judicial effectiveness, yet expert proceedings may contribute significantly to delays. Time may be required to select and appoint experts, clarify the scope of their tasks, conduct examinations, analyse evidence, consult relevant professional materials, and

[105] Katz 2014, p. 8.
[106] Katz 2014, pp. 20–22.
[107] Brewer 1998, p. 1681.
[108] Custers 2024, pp. 5–8.
[109] Howlin 2004, pp. 25–26.
[110] Imwinkelried 2007, p. 1.

prepare the final report. Expert evidence may also generate additional technical disputes between the parties, effectively creating a secondary dispute within the principal proceedings and increasing both complexity and duration.[111]

Jordanian legislation expressly recognises this risk. Under Article 86(1) of the Jordanian Code of Civil Procedure, an expert who fails to submit a report within the prescribed period must explain the steps taken and the reasons for the delay. Where the explanation is accepted, the court may grant additional time. Otherwise, the court may impose a fine, establish a new deadline, or replace the expert and require the return of amounts already received.

The problem has also been acknowledged institutionally. The JJC's 2010 Annual Report called for clearer standards governing court experts and for faster and more effective expert procedures.[112] Similarly, the Royal Committee for Developing the Judiciary and Enhancing the Rule of Law recommended establishing a regulated system of court experts, including an updated register covering different specialisations and geographic areas. [113]

These concerns initially led to the adoption of Expert Evidence Bylaw No. 35 of 2018, which established an institutional framework for the accreditation, registration, and supervision of court experts.[114] A further reform was introduced in 2026 through Expert Evidence Bylaw No. 48 of 2026, which added organisational and administrative mechanisms concerning the registration, accreditation, selection, and monitoring of experts.[115] Although these measures are intended to improve the administration, efficiency, and quality of expert evidence, their practical effect has not yet been established, and the new framework does not introduce a distinct mechanism for assisting judges in the substantive technical evaluation of expert reports.

3.3.2.4 Bias and Impartiality of Expert Witnesses

Impartiality is a fundamental requirement of expert evidence. However, the risk of bias may arise in different forms. The first involves identifiable conflicts of interest, such as personal, financial, professional, or employment relationships with one of the parties.[116] The existence of such a connection does not automatically disqualify an expert or render the expert evidence inadmissible. Rather, the nature and extent of the connection must be assessed in determining whether the expert remains willing and able to discharge the primary duty owed to the court.[117]

[111] Law Reform Commission 2008, pp. 234–235.
[112] Jordanian Judicial Council 2010, p. 36.
[113] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017, p. 101.
[114] Hashemite Kingdom of Jordan 2018, Expert Evidence Bylaw before the Regular Courts No. 35 of 2018.
[115] Hashemite Kingdom of Jordan 2026, Expert Evidence Bylaw for the Regular Courts No. 48 of 2026.
[116] Chin, Lutsky and Dror 2019, p. 29.
[117] Armchair Passenger Transport Ltd v Helical Bar Plc & Anor [2003] EWHC 367 (QB), para. 29.

A second and more difficult form is unconscious cognitive bias. Experts may be influenced by contextual information, professional background, organisational culture, expectations, or other factors without consciously intending to favour a particular outcome. Cognitive research suggests that even experienced professionals may be affected by selective attention, fixation, or irrelevant contextual information when interpreting evidence.[118] Consequently, formal instructions requiring impartiality may not, by themselves, eliminate all forms of bias.[119]

Jordanian law provides several safeguards intended to protect expert independence. Experts are required to take the prescribed oath and to disclose any circumstances that may raise doubts concerning their impartiality or independence in relation to the parties, their representatives, or the court.[120] The Jordanian Court of Cassation has also held that failure to comply with legal requirements intended to safeguard impartiality may invalidate the expert report.[121] Nevertheless, legal disclosure requirements principally address identifiable conflicts of interest and may be less effective in addressing unconscious forms of bias. Practical safeguards therefore remain important in strengthening the reliability and impartiality of expert evidence.

3.3.3 Interview Findings on Expert Evidence

The interviews revealed several practical challenges concerning the use of expert evidence in Jordanian courts. The most prominent related to the selection and technical competence of experts, the availability of specialised expertise, the court's capacity to evaluate expert work substantively, and, to a lesser extent, questions of impartiality and cost.

A recurring concern related to the initial selection of competent experts. Some judges explained that formal qualifications are readily visible to the court, whereas the expert's actual practical competence is more difficult to assess before appointment (P1 and P6). One judge noted that expert opinions may differ considerably on the same technical issue, increasing uncertainty for the court (P1). Another described relying on previous experience with particular experts, appointing them initially on a trial basis and continuing to use them where their performance proves satisfactory (P3). These observations suggest that formal qualifications alone may not provide judges with sufficient information to distinguish between different levels of practical competence.

Several judges also expressed reservations about the existing system of accredited experts. They noted that experts appearing on the Ministry of Justice's approved list may be unknown to the judge and that inclusion in the list does not necessarily enable the court to assess differences in actual technical ability (P1, P3, P7 and P15). As P3 explained, an unfamiliar expert may lack the necessary technical skill or

[118] Chin, Lutsky and Dror 2019, p. 29; see also Dror, McCormack and Epstein 2015, pp. 8–9.
[119] Chin, Lutsky and Dror 2019, p. 31.
[120] Hashemite Kingdom of Jordan 1988 (as amended), Code of Civil Procedure No. 24 of 1988, Art. 83(3).
[121] Court of Cassation (Jordan) 2024, Criminal Cassation Decision No. 1252/2024, 16 July 2024; Court of Cassation (Jordan) 2023, Civil Cassation Decision No. 9099/2023, 28 December 2023.

may delay the proceedings, despite being formally eligible for appointment. Nevertheless, not all participants were dissatisfied with the existing framework. P17 considered the system generally well regulated and emphasised that judges retain procedural mechanisms to reject a report, request its completion, or appoint another expert where deficiencies arise.

The availability of specialised experts also emerged as an important practical issue, particularly outside Amman and other major urban centres. Judges serving in more distant areas reported difficulties in obtaining experts in narrowly specialised fields, either because suitable experts were unavailable locally or were reluctant to travel from Amman. This could increase both the cost and duration of expert procedures (P4, P5 and P16). Similar difficulties were reported in medical liability cases, where some physicians may be reluctant to participate in determining whether a medical error occurred (P9). These findings indicate that access to expertise is not distributed evenly across courts and fields of specialisation.

The technical competence of experts was another significant concern. Several judges referred to considerable differences between experts working in the same field and to weaknesses in the technical capacity of some experts (P13, P15, P16 and P18). Limited access to appropriate technical tools was also mentioned, particularly in technology-related matters (P13), while one judge reported instances in which experts relied on assistance from other specialists without clearly disclosing this in the report (P16). At the same time, technical competence and familiarity with court procedures do not necessarily coincide. P11 observed that many accounting and tax experts possess strong professional qualifications but may lack sufficient experience with judicial procedures, which can result in problems arising from non-compliance with formal legal requirements rather than deficiencies in their technical knowledge. The same participant estimated that expert evidence is required in approximately 90% of tax disputes.

The most significant finding, however, concerned the court's capacity to evaluate expert evidence. A substantial number of judges acknowledged that their limited knowledge of specialised technical fields can make substantive evaluation difficult (P1, P3, P4, P5, P6, P7, P9, P13, P14 and P15). P15 described this difficulty particularly clearly: "It is difficult for one person to encompass all of these sciences. Therefore, I think that oversight in reality is closer to formal oversight, and it is difficult for it to become fully substantive oversight."

Similarly, P1 considered the more serious difficulty to be determining whether an expert is genuinely technically competent, since experts may possess comparable formal qualifications and experience while differing considerably in actual capability. These responses reveal an important distinction between the court's formal authority to supervise expert evidence and its practical ability to assess the scientific or technical substance of the expert's work.

Judges reported using several methods to address this difficulty. They may summon the expert to clarify specific points or order a new expert examination where necessary (P1 and P13). Some participants also

stressed the value of judicial specialisation and technical training as means of improving the court's capacity to formulate expert tasks and assess their performance (P1, P3, P9 and P18). P9, for example, suggested that a judge or prosecutor specialising in cybercrime would be better able to understand the essential features of technical expertise in that field and to supervise its execution.

Of particular relevance, several judges stated that they sometimes consult external sources when attempting to verify technical assertions or estimates contained in expert reports. These sources included other specialists and online searches (P2, P5 and P6), while one participant reported using ChatGPT for this purpose (P18). This finding should not be understood as demonstrating that such external tools can substitute for expert evidence. Rather, it indicates that some judges already seek supplementary sources of technical information when they consider the available expert material insufficient for effective evaluation.

This practice also raises a procedural question concerning information obtained outside the case record. A distinction should be drawn between using external material for general background understanding and relying on an external factual proposition material to the dispute. Where such information may influence the decision, issues of disclosure and the parties' opportunity to challenge it arise.

The interviews presented a more mixed picture concerning expert impartiality. Several judges did not regard bias as a major practical problem in the current system (P1, P3, P13, P15 and P18). They referred to safeguards such as the expert's legal oath and the court's ability to exclude and replace an expert where impartiality is in doubt. Nevertheless, some participants acknowledged that human decision-making cannot be assumed to be entirely free from personal preference, external influence, or other forms of bias. Concerns were also raised regarding relationships between certain experts and repeat litigants, particularly insurance companies in vehicle-damage claims and parties involved in medical liability disputes (P8 and P9). Accordingly, although bias was less prominent in the interviews than concerns about technical competence, it cannot be regarded as entirely absent from practice.

Cost was also discussed, although less frequently than competence and judicial evaluation. Participants indicated that expert fees vary according to the nature and complexity of the task. Costs were generally considered more manageable in straightforward damage-assessment cases, but potentially higher in areas such as forensic accounting and medical expertise and where geographic distance is involved (P8 and P10). Conversely, P11 noted that some specialists decline court appointments because the fees offered are insufficient. This suggests that the challenge is not simply that expert evidence may be expensive for litigants; inadequate remuneration may also reduce the willingness of highly specialised professionals to undertake court work.

Overall, the interviews broadly support several concerns identified in the literature and official reports, while also revealing features specific to Jordanian judicial practice. The most prominent challenges

concerned the initial identification of competent experts, substantial differences in technical ability, shortages of specialised experts in some regions and fields, and, above all, judges' limited ability to evaluate complex expert work substantively. By contrast, expert bias was not generally perceived as a major practical difficulty, although some participants acknowledged that impartiality cannot be fully guaranteed. Cost also received less attention, despite recognised variations between different forms of expertise. Judicial specialisation and technical training were repeatedly identified as possible means of strengthening the court's capacity to engage with specialised evidence.

3.4 Chapter Conclusion

This chapter has identified several challenges affecting the quality of judicial decisions in Jordan. It has also revealed limitations in the available research and institutional approaches for assessing judicial decision quality. Drawing on official reports, decisions of the Jordanian Court of Cassation, and interviews with judges, the analysis indicates that judicial workload emerged as a prominent factor that may constrain the capacity of judges to examine cases thoroughly, assess evidence, conduct legal research, and provide sufficiently reasoned decisions.

The chapter has further shown that the increasing complexity of modern disputes places additional demands on judges, particularly where cases involve technological, scientific, or other specialised matters that fall outside traditional legal training. This creates a growing need to strengthen judges' access to reliable legal and technical knowledge and appropriate forms of professional support. At the same time, the current digital environment within the Jordanian judiciary remains focused primarily on case management and procedural administration, with comparatively limited support for the substantive stages of judicial decision-making.

Expert evidence represents a further challenge. The findings indicate substantial variation in experts' technical competence, difficulties in ensuring the timely completion of expert work, unequal access to specialised experts across different regions, and practical limitations on judges' ability to evaluate complex expert opinions substantively. Although recent regulatory reforms seek to strengthen the organisation and supervision of court expertise, their practical impact is too recent to assess. The persistence of these challenges therefore supports continued examination of additional institutional and technological means of assisting judges in dealing with specialised evidence.

Taken together, the findings demonstrate that the challenges affecting judicial decision quality in Jordan are interconnected. Heavy workload, increasingly complex disputes, limited decision-support tools, and difficulties surrounding expert evidence may each affect the time, information, and analytical capacity available to judges. In response to these pressures, Jordan has adopted a number of judicial reform programmes and policies. The next chapter examines the principal reforms introduced by the JJC and evaluates the extent to which they address the challenges identified in this chapter.

4. Conventional Responses to Judicial Challenges and Their Limitations

Jordan has long recognised a number of challenges affecting the work of its judiciary. In response, the JJC has adopted various policies and reform measures intended to mitigate their effects. A broader reform initiative was undertaken through the establishment of the Royal Committee for Developing the Judiciary and Enhancing the Rule of Law. The Committee submitted its final report in February 2017, providing a comprehensive framework for judicial development and proposing legislative, institutional, procedural, and administrative reforms.

The Royal Committee's report became an important framework for subsequent judicial reform. It examined the existing situation of the Jordanian judiciary, identified factors contributing to the challenges facing the courts, and proposed recommendations and implementation programmes addressing judicial organisation, procedures, human resources, infrastructure, and other aspects of judicial work. Its recommendations were directed principally to the government and the JJC and informed a number of subsequent legislative and institutional reforms.

In addition, the JJC issues annual reports examining court workload, achievements, challenges, and developments during the preceding year. These reports provide an important institutional source for identifying recurring difficulties within the Jordanian judiciary and the measures proposed or adopted to address them. Against this background, this chapter examines the principal conventional responses adopted in Jordan to address challenges affecting judicial decision-making and evaluates the extent to which those responses address the problems identified in Chapters Two and Three.

4.1 Procedural Reforms

For the purposes of this study, responses to judicial workload and delay may broadly be divided into two approaches. The first seeks to reduce the number of disputes requiring judicial determination through ADR, including mediation and arbitration. The second seeks to improve the capacity and efficiency of courts through procedural and institutional reform.[122] Although ADR constitutes an important response to court congestion, its effectiveness and regulation raise separate questions that fall beyond the scope of this study. The present discussion therefore focuses on reforms directed at the judicial process itself.

Procedural reforms have altered several characteristics of traditional litigation. They commonly include more active judicial case management, procedural coordination between judges and parties, measures designed to prevent unnecessary delay or abusive procedural conduct, and deadlines for submitting evidence, arguments, and applications.[123] Some systems also establish target periods for disposing of

[122] Martinuzzi 2017, p. 67.
[123] Martinuzzi 2017, p. 65.

cases or use case-disposal indicators in evaluating judicial performance. The underlying objective is to reduce unnecessary procedural time and improve the efficient progression of cases.

Jordanian civil and criminal procedural legislation similarly contains numerous provisions establishing time limits for parties to submit evidence, applications, pleadings, and other procedural materials.[124] Failure to comply with some of these statutory periods may result in the loss of the procedural opportunity concerned.[125] Jordanian legislation also prescribes timeframes for the determination of certain categories of cases. The nature and legal consequences of these timeframes vary according to the relevant statutory provision, but collectively they reflect a legislative effort to organise litigation and reduce unnecessary delay.

Comparable reforms have been adopted in other jurisdictions. In New South Wales, Australia, procedural rules governing expert evidence encourage the early management of expert issues and the use of joint expert conferences. Such procedures are intended to narrow the matters in dispute, reduce hearing time, and enhance the prospects of settlement in technically complex cases.[126]

Italy provides another example of large-scale procedural and institutional reform in response to lengthy proceedings and substantial case backlogs.[127] Supported by EU funding, reforms have sought to simplify judicial procedures, reduce pending caseloads and disposition times, strengthen alternative dispute resolution, and provide additional human and administrative resources to the courts.[128] Such measures illustrate the scale of institutional intervention that may be required to address persistent judicial delay. At the same time, reforms of this nature require substantial and sustained financial resources.

Financial capacity is itself relevant in Jordan. The JJC has identified limitations in its financial allocations as an obstacle to the implementation of some development and modernisation projects and has called for increased funding to support technological, and institutional reforms.[129] This demonstrates that the effectiveness of conventional judicial reform may depend not only on the design of the relevant policy but also on the resources available for its implementation.

Procedural case-management measures also involve important trade-offs. Greater judicial control over the progression of litigation may improve efficiency, but it may also restrict the ability of parties to determine how their cases are presented and may create tension between procedural speed and fairness.[130] More importantly for the present study, procedural deadlines do not necessarily address the

[124] Hashemite Kingdom of Jordan 2017, Magistrate Courts Law No. 23 of 2017, Art. 5; Hashemite Kingdom of Jordan 1988 (as amended), Code of Civil Procedure No. 24 of 1988, Arts. 59, 72, 187 and 191.
[125] Court of Cassation (Jordan) 2022, Civil Cassation Decision No. 8344/2022, 29 December 2022.
[126] New South Wales 2005 (as amended), Uniform Civil Procedure Rules 2005, r. 31.24.
[127] Giavazzi and Goretti 2024.
[128] Fabri 2022, p. 1017.
[129] Jordanian Judicial Council 2024, p. 140.
[130] Sourdin and Burstyner 2014, p. 54.

underlying limits on a judge's capacity to resolve a large number of complex disputes while maintaining adequate quality.

The findings presented in the preceding chapters suggest that the central constraint is not simply the willingness of judges to dispose of cases, but their practical capacity to do so while maintaining sufficient judicial quality. That capacity is affected by the number of cases requiring attention, the time available for each file, the increasing complexity of disputes, the need to evaluate specialised evidence, and the availability of appropriate legal and technical support.[131] Measures that primarily require judges to resolve cases within shorter periods may therefore improve procedural discipline without necessarily expanding the substantive capacity available to judges.

This distinction is particularly important because an excessive emphasis on speed may produce unintended consequences. Deficiencies in first-instance judgments may increase the likelihood of appeal and require more extensive examination by higher courts, thereby transferring rather than eliminating part of the judicial workload. A study of the Greek judicial system similarly observed that "improving the quality of first-instance rulings may reduce the appeals rate."[132] This suggests that quality and efficiency should not be treated as competing objectives: improving the quality of decisions at an earlier stage may itself contribute to reducing subsequent judicial workload.

Jordan has attempted to limit the volume of appellate litigation by imposing eligibility requirements or monetary thresholds for access to higher courts.[133] Such measures may reduce the number of cases reaching appellate or supreme courts, but they also reduce opportunities for appellate correction. They therefore require a careful balance between judicial efficiency and effective access to judicial review.

Increasing the number of judges may appear to provide a more direct response to excessive caseloads. However, judicial expansion involves significant financial, administrative, and logistical costs. New judges must be selected, trained, supported, and integrated into the judicial system, while additional appointments may also require expanded court facilities, staff, and technological resources. The relatively stable size of the Jordanian judiciary over recent years illustrates some of the practical limits surrounding continued expansion. Studies have also suggested that judicial productivity may adjust to staffing levels, meaning that an increase in the number of judges does not necessarily produce a proportionate increase in the number of cases resolved.[134]

[131] Time standards alone are insufficient to assess court delay because they do not account for case type, complexity, or case-finalisation processes; see Sourdin and Burstyner 2014, pp. 50–51.
[132] Mitsopoulos and Pelagidis 2007, p. 219.
[133] Jordan has restricted access to cassation appeals in civil matters: only judgments issued by the Courts of Appeal in cases exceeding twenty thousand dinars may be appealed directly. In all other cases, the appellant must first obtain permission from the Court of Cassation for the appeal to be heard, in accordance with Article 191 of the Code of Civil Procedure. See Hashemite Kingdom of Jordan 1988 (as amended), Code of Civil Procedure No. 24 of 1988, Art. 191.
[134] Bosio 2023, p. 25.

Procedural deadlines, active case management, increased judicial staffing, and other conventional reforms may therefore make important contributions to judicial efficiency, but none of these measures alone eliminates the structural pressures associated with high caseloads. Effective reform must address not only how quickly judges are expected to resolve cases, but also the capacity available to them to perform that task effectively. This requires attention to the time, resources, knowledge, tools, and institutional support available to judges throughout the judicial decision-making process. Further detailed and in-depth studies should also be conducted to assess the impact of these procedural reforms on the challenges faced by judges, an area that remains largely absent from the Jordanian context.

4.2 Judicial Specialisation as a Reform Policy

Judicial specialisation represents one of the principal institutional responses adopted in Jordan to strengthen judicial competence, efficiency, and consistency. This section examines the rationale and implementation of this policy before evaluating its practical effectiveness in light of the interviews conducted with Jordanian judges.

4.2.1 Literature and Policy Analysis

Judicial specialisation is commonly regarded as a means of strengthening judges' familiarity and efficiency within particular fields of adjudication. Repeated exposure to similar categories of cases may enable judges to develop greater substantive knowledge, become more familiar with relevant legislation and precedents, and resolve cases more efficiently. Research by Decio Coviello and colleagues illustrates this effect in Italian courts, observing that "when judges receive more cases of a certain type, they become faster, that is, more likely to close cases of that type in any one of the corresponding hearings."[135]

Specialisation may also allow judicial work to be allocated according to differences in judges' experience and professional strengths. An Australian study found that, although judges should retain the ability to undertake different forms of judicial work, it is unrealistic to assume that every judge will perform equally well in every field.[136] The same study identified court size as an important condition for effective specialisation: larger urban courts may permit narrower allocation of case types, whereas judges in smaller courts often need to deal with a broad range of matters. It also cautioned that excessive specialisation may gradually weaken judges' broader legal skills and reduce their ability to deal effectively with cases outside their usual field.[137]

[135] Coviello, Ichino and Persico 2019, p. 403.
[136] Mack, Roach Anleu and Wallace 2012, pp. 75–76.
[137] Mack, Roach Anleu and Wallace 2012, p. 76.

Judicial specialisation in Jordan operates at different institutional levels. At the broader jurisdictional level, the legal system contains distinct judicial jurisdictions and specialised courts, including the administrative judiciary and courts or judicial bodies dealing with areas such as tax, customs, and juvenile matters.[138] Within the regular judiciary, a more direct form of specialisation is achieved through the allocation of judges and judicial chambers to particular categories of cases. The latter form is particularly relevant to this study because it concerns the organisation of judges' daily work and their capacity to develop expertise in specific fields.

The policy received further emphasis following the 2017 report of the Royal Committee for Developing the Judiciary and Enhancing the Rule of Law, which recommended expanding judicial specialisation.[139] In practice, judges may first be allocated to broad civil or criminal divisions and then to narrower areas, including commercial and economic disputes, cybercrime, corruption, human trafficking, money laundering, domestic violence, labour disputes, insurance claims, and landlord–tenant disputes.[140]

The JJC's 2024 Annual Report indicates that 87% of judges were classified as specialised. The report also presents the distribution of judicial specialisations across civil chambers (41%), criminal chambers (40%), commercial chambers (5%), public-treasury cases (1%), and mixed specialisations (13%).[141] These broad classifications encompass narrower forms of specialisation, as also reflected in the interviews conducted for this study.

Jordan has pursued both horizontal and vertical forms of judicial specialisation. Horizontal specialisation refers to the allocation of different subject areas within the same level of jurisdiction, while vertical specialisation seeks to preserve subject-matter expertise across successive levels of the judicial hierarchy. Accordingly, specialised chambers operate not only at first instance but also, to varying degrees, at appellate and cassation levels and within the Public Prosecution.[142] Specialised civil

[138] Tax and customs disputes in Jordan provide a clear example of institutional judicial specialisation. The Tax Court of First Instance and the Customs Court of First Instance exercise specialised jurisdiction over disputes falling within their respective statutory fields, and their judges are appointed by the Judicial Council. Appeals are heard by separate specialised appellate courts, namely the Tax Court of Appeal and the Customs Court of Appeal, rather than by the ordinary regional Courts of Appeal. The Public Prosecution also includes specialised tax and customs prosecution offices, with designated prosecutors serving before these courts. Decisions of the specialised appellate courts may ultimately be challenged before the Jordanian Court of Cassation in accordance with the applicable statutory requirements. This structure demonstrates a hierarchical form of judicial specialisation extending from the first-instance level to specialised appellate review, while maintaining ultimate review by the Court of Cassation. See: The Hashemite Kingdom of Jordan 2014, Income Tax Law No. 34 of 2014, arts. 42, 48; The Hashemite Kingdom of Jordan 1998, Customs Law No. 20 of 1998, as amended, arts. 222–225; The Hashemite Kingdom of Jordan 2001, Law on the Formation of Regular Courts No. 17 of 2001 (as amended by Law No. 12 of 2019), art. 14(b)(2), (c)(2).

[139] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017, p. 46.

[140] Jordanian Judicial Council 2024, p. 23.

[141] Jordanian Judicial Council 2024, p. 23.

[142] Jordanian Judicial Council 2021, p. 13.

and criminal chambers within the Court of Cassation deal with categories such as labour, economic and commercial disputes, leases, economic crimes, corruption, and cybercrime.[143]

Maintaining specialisation across judicial levels may contribute to greater familiarity with particular fields, more consistent legal interpretation, and the development of specialised jurisprudence. However, these advantages depend on the practical conditions under which the policy is implemented, particularly the degree of continuity in judicial assignments. Specialisation is unlikely to produce its full institutional benefits where judges are frequently moved between different chambers or areas of jurisdiction, as this may limit the accumulation of experience within a particular field. This concern has been expressly recognised in Jordan's Justice Sector Strategy 2022–2026, which identifies the lack of stability in the career paths of judges serving in civil and commercial chambers as a factor limiting the development of the cumulative expertise required in commercial chambers.[144]

Despite its benefits, judicial specialisation also presents several limitations. Effective allocation requires attention to differences in judges' abilities, experience, working methods, and professional preferences.[145] The comparative literature also warns that inefficient distribution may create workload inequalities, particularly where judges who demonstrate greater competence or speed are assigned additional cases because of their effectiveness. In such circumstances, specialisation may unintentionally result in disproportionate burdens.[146]

A further limitation is that high overall workload and limited judicial staffing may prevent courts from maintaining specialisation in practice.[147] Where a court has only a small number of judges, it may be necessary for each judge to hear several categories of cases regardless of formal specialisation. The effectiveness of specialisation therefore depends not merely on establishing specialised classifications, but also on having sufficient judicial capacity to preserve those classifications in day-to-day court work.

4.2.2 Interview Findings on Judicial Specialisation

A large majority of the interviewed judges regarded judicial specialisation as beneficial for judicial competence, efficiency, and decision quality (P1, P2, P3, P4, P5, P6, P7, P9, P10, P12, P13, P14, P15, P16 and P17). Participants particularly associated specialisation with greater familiarity with the relevant legislation and jurisprudence and with more rigorous decision-making. As P12 explained, "The drafting of the decision becomes more rigorous, and the judge becomes more familiar with the judgments and precedents related to that field."

[143] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017, p. 25.
[144] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022, p. 103.
[145] Mack, Wallace and Roach Anleu 2012, pp. 141-143.
[146] Mack, Wallace and Roach Anleu 2012, p. 141.
[147] Mack, Wallace and Roach Anleu 2012, pp. 142.

The interviews nevertheless revealed concerns about excessive specialisation. P9 described the risk as follows:

"The negative aspect is that, over time, we create judges who do not have sufficient knowledge outside their specialisation; and as the judge progresses, he may later face difficulty dealing with other specialisations. Another drawback is that specialisation may lead the judge to rely on the information he already has and reduce his motivation to conduct legal research beyond the scope of his specialisation."

Similar concerns were expressed by P16 and P17. These observations suggest that specialisation may deepen knowledge within a particular field while, if applied too rigidly or for prolonged periods, narrowing broader judicial exposure.

More importantly, several participants distinguished between the benefits of specialisation and its capacity to address judicial workload. P15 stated that "The challenges remain, whether specialisation exists or not, given the heavy workload on the judge—whether within his field of specialisation or without specialisation," a view also reflected by P17. Specialisation may therefore improve the manner in which a judge handles particular cases without necessarily reducing the number of cases requiring judicial attention.

Court size also emerged as a major practical constraint. P1 explained:

"Applying specialisation in Jordan is difficult; it can only be applied in certain courts, such as the Amman Court of First Instance—the main court—and perhaps Irbid and Zarqa as large courts. Outside these courts, it is almost impossible to apply specialisation, because the court may have two or three First Instance judges, or four, and five magistrates, so how do you want to specialize them? It is difficult to allocate a particular judge to each subject." P10 and P15 expressed similar views. This finding closely reflects the comparative literature, which likewise identifies the number of judges and the size of the court as important conditions for meaningful specialisation.

The interviews also revealed difficulties in maintaining an equitable distribution of workload within specialised arrangements (P1). In addition, continuity of specialisation across judicial levels is not always guaranteed. P1 observed that specialisation is generally easier to apply in larger first-instance courts, whereas courts with fewer judges may have less flexibility to preserve narrow areas of expertise.

A further distinction emerged between formal specialisation and specialisation in practice. P3 observed that a judge may officially be assigned to only two categories of cases but, because of practical needs, ultimately deal with six or seven different categories. Formal classification as a specialised judge therefore does not necessarily mean that the judge's actual caseload is confined to the designated field. Some participants consequently proposed greater use of specialised courts, rather than relying exclusively on specialised individual judges (P3). This should, however, be understood as an alternative

institutional model proposed by participants rather than as a solution whose effectiveness can be assumed in advance.

Overall, the evidence indicates that judicial specialisation can strengthen judges' familiarity with particular areas of law, improve efficiency within those areas, and contribute to greater consistency and decision quality. The interview findings broadly support these advantages. At the same time, specialisation cannot by itself resolve the broader challenges of heavy workload and increasingly complex litigation. Its effectiveness depends on factors including court size, the number and distribution of judges, appropriate matching of judges to fields of specialisation, continuity across judicial levels, and the extent to which specialised caseloads can actually be maintained in practice.

Judicial specialisation should therefore be understood as a valuable but partial response to the challenges identified in Chapters Two and Three. It may strengthen judges' expertise and may reduce the time or effort required for particular judicial tasks, even where the number of incoming cases remains unchanged. Its practical contribution therefore depends on the nature of the cases, the tasks involved, and the conditions of implementation. The evidence examined in this study does not quantify these effects in Jordan, and specialisation cannot by itself provide every judge with expertise across the growing range of technical and technological issues arising in contemporary litigation.

4.3 Continuous Judicial Training as a Reform Policy

Continuous judicial training represents another institutional response to the challenges affecting judicial competence and decision quality. This section examines the rationale and implementation of judicial training in Jordan and evaluates its practical benefits and limitations in light of the interview findings.

4.3.1 Literature and Policy Analysis

Judges inevitably enter and progress through judicial service with different educational backgrounds, professional experiences, and areas of expertise. Moreover, legal and judicial work itself continues to evolve through legislative change, emerging forms of litigation, technological developments, and new methods of evidence. Judicial formation should therefore not be confined to academic education or pre-appointment preparation. Continuous training serves an important role in maintaining and developing the legal, analytical, technical, and professional knowledge required throughout judicial service.[148]

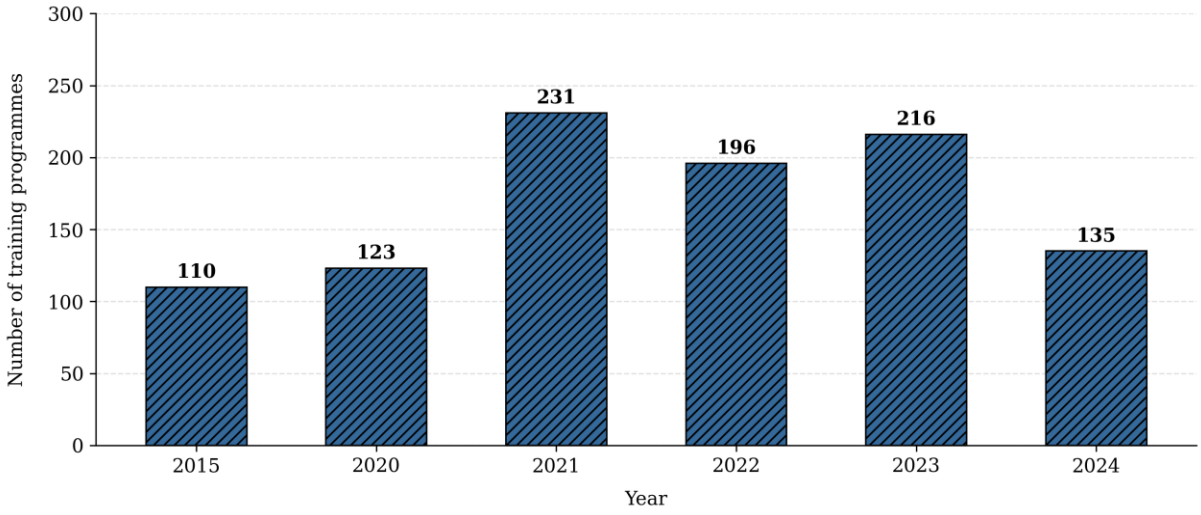
Judicial training may address both substantive legal knowledge and practical judicial skills. Particularly relevant to the challenges identified in Chapter Three are areas such as judgment drafting, coherent

[148] Hammergren 1998, pp. 5–7, 20–21.

legal reasoning, legal qualification of the facts, the analysis and weighing of evidence, modern forms of proof, technological developments, and the use of relevant judicial precedent. Training directed at these areas may strengthen judges' capacity to engage with increasingly complex litigation while maintaining the quality of judicial reasoning.

In Jordan, the JJC, in cooperation with the Jordanian Judicial Institute, has adopted annual continuous training programmes for serving judges.[149] Training plans are developed in light of identified judicial needs, including recommendations from the Judicial Inspection Directorate, which is institutionally positioned to identify recurring areas in which judicial performance may require further development.[150] The JJC's annual reports also record the number of specialised courses and workshops and the judges participating in them. In addition, Jordanian judges may participate in external training programmes and international judicial exchanges intended to expose them to comparative experiences and developments in other judicial systems. The scale and continuity of judicial training activity reported by the JJC are illustrated in Figures 2 and 3, which present, respectively, the number of judicial training programmes and reported judicial participation in selected years between 2015 and 2024.

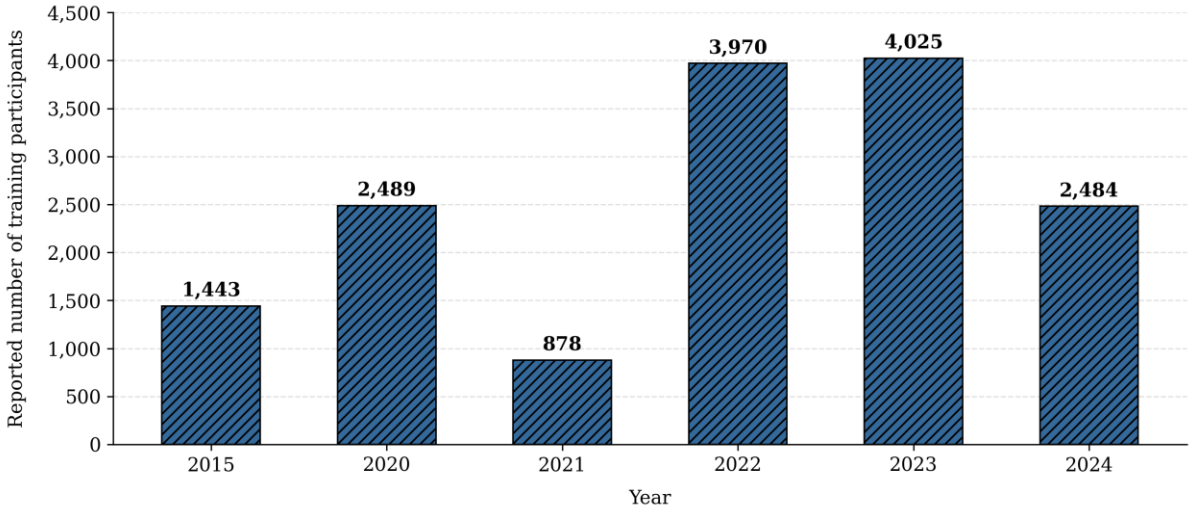
Figure 2 Judicial Training Programmes in Jordan (2015–2024)



Source: Author's compilation based on the Annual Reports of the Jordanian Judicial Council, selected years.

[149] Jordanian Judicial Institute n.d.
[150] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017, p. 45.

Figure 3 Reported Judicial Participation in Training Programmes in Jordan (2015–2024)



Note: The figures are reported as presented in the JJC Annual Reports. The 2021 figure counts judges without duplication, whereas figures for other years may include repeated participation by the same judge in more than one training programme.

Source: Author's compilation based on the Annual Reports of the Jordanian Judicial Council, selected years.

The continuing need for judicial development is also reflected in the broader literature. As one study observed, "Judges have become more commonly viewed as human, not merely as 'oracles' of the law residing in ivory towers but as experts in law subject to an ever-changing world …"[151] Continuous training is therefore not necessarily a response to deficient judicial competence, but a normal consequence of the changing legal, social, scientific, and technological environment in which judges perform their functions.

A more significant issue concerns how the effectiveness of such training is evaluated. The JJC's annual reports regularly provide quantitative information on training activities, including the number of programmes delivered and judges participating in them.[152] The 2022 Annual Report, however, identified among the existing challenges the absence of specific measurement tools for determining whether training programmes produce the intended change in judges' performance.[153] More recent reports have begun to include information concerning training quality, but the available indicators remain largely focused on matters such as trainers' performance, programme organisation and supervision, general perceptions of content, and logistical arrangements.[154]

[151] Cros and Enright 2023, p. 88.
[152] See the objectives, plans, and various programmes of the Jordanian Judicial Institute on its official website. Jordanian Judicial Institute n.d.
[153] Jordanian Judicial Council 2022, pp. 98-100.
[154] Jordanian Judicial Council 2024, p. 121; Jordanian Judicial Council 2023, p. 130.

These indicators are useful for evaluating the delivery of training but do not necessarily demonstrate its impact on judicial performance. A distinction should therefore be drawn between training activity and satisfaction indicators, such as the number of courses, participation rates, or participants' assessment of a programme, and training outcome indicators, which seek to determine whether training has produced sustained improvements in judicial work. In the present context, relevant questions might include whether training contributes to stronger judicial reasoning, more effective analysis of evidence, better engagement with technically complex disputes, or a reduction in recurring deficiencies identified through judicial inspection.

Comparative guidance developed by the European Judicial Training Network provides a useful benchmark in this respect. It emphasises evaluation at different stages and through different methods, extending beyond participants' immediate reactions to consider the subsequent application and impact of acquired knowledge and skills.[155] Such an approach suggests that the principal issue in Jordan is not the absence of judicial training, which is provided extensively, but the need for stronger mechanisms to assess its longer-term effect on judicial performance.

Continuous training therefore remains an important component of judicial capacity-building.[156] Its contribution may be strengthened by closer alignment between training content and judges' practical and specialised needs, greater emphasis on applied judicial skills, and more systematic evaluation of outcomes rather than reliance primarily on programme numbers and immediate participant assessments.

4.3.2 Interview Findings on Judicial Training

The interviews confirmed the importance attached by judges to continuous professional training. Several participants considered training courses valuable for developing judicial knowledge and competence (P6, P16 and P18). At the same time, the interviews identified limitations concerning the technical depth of some programmes, their relationship with judges' practical needs, and the difficulty of combining training with already demanding judicial workloads.

One concern related to training in technical and technological matters. P7 observed that some programmes addressing technologically complex issues remain focused primarily on their legal dimension:

"Especially in technical matters, they present only the legal side; as for technical matters, the vast majority of judges are not familiar with technology and AI in a way that enables them to confront these issues in the courtroom."

This observation is particularly relevant to the challenges concerning modern disputes identified in Chapter Three. Training may strengthen judges' understanding of the legal framework governing

[155] European Judicial Training Network 2023, pp. 8–9, 20–21.
[156] Judicial Studies Alliance 2007, pp. 3, 6.

emerging technologies, but technically complex litigation may also require knowledge extending beyond purely legal analysis.

P13 expressed a similar view while emphasising the combined importance of experience and training:

“I believe that when a judge handles a particular type of case and accumulates experience in it, and receives training courses in the same subject, that training and accumulated experience may address about 50% of the problem. But many issues are new and emerging and fall outside purely legal aspects—technical and technological matters—and I think the training courses we receive do not fully address these aspects.”

The reference to “50%” reflects the participant’s personal assessment rather than a quantitative measurement. More importantly, the observation demonstrates that training and accumulated judicial experience were perceived as valuable but insufficient to provide judges with expertise across all emerging technical fields.

The interviews also highlighted the practical tension between training and judicial workload. P15 provided a particularly balanced assessment:

“The courses are nice, good, and awareness-raising; they strengthen our ideas and legal knowledge, and open space for discussion on matters that may not be fully formed for us. From that angle, the courses are excellent. But, on the other hand, they take some time from our working hours, and sometimes the number of hours is not sufficient. Balancing all of this is difficult; they are not fully sufficient, but they also cannot be abandoned.”

This observation captures an important institutional constraint. Training requires judges to devote time away from their existing judicial duties, while heavy caseloads may restrict both opportunities to participate and the depth of training that can realistically be provided. The problem is therefore not simply whether training should be offered, but how it can be integrated into judicial work without creating additional pressure on already limited judicial time.

Overall, the interview findings confirm the value of continuous judicial training while also revealing important limitations. Training can strengthen legal knowledge, encourage professional discussion, and support judges in developing expertise in particular fields. However, its effectiveness depends on the relevance and practical depth of the content, the competence of trainers in specialised subjects, the time available for meaningful participation, and the extent to which programmes respond to the actual challenges encountered by judges.

The evidence therefore supports the continuation and further development of judicial training, particularly through closer alignment with judges’ practical and specialised needs and stronger methods for evaluating its impact on judicial performance. Training may reduce the time or effort required for particular tasks and improve their quality, even where the number of cases remains unchanged. Its

practical contribution therefore depends on the relevance and depth of the training, the conditions of implementation, and its effect on judicial performance. The evidence examined in this study does not quantify these effects in Jordan, and training alone cannot provide every judge with specialised knowledge across the expanding range of scientific and technological issues that may arise in contemporary litigation.

4.4 Technical Offices as an Institutional Support Mechanism

Unlike reforms directed primarily at procedure, judicial specialisation, or training, technical offices provide judges with direct legal and research support in the performance of judicial work. The JJC adopted this institutional model through the establishment of a specialised technical office within the Jordanian Court of Cassation in 2010, reflecting the particular importance of research and legal support at the highest level of the regular judiciary.[157] The office consists of judges and legal researchers who perform specified functions in support of the Court's judicial panels.[158]

The office provides both procedural and substantive support. At the procedural level, it conducts a preliminary review of incoming cassation appeals, including matters relating to filing deadlines, court fees, legal representation, and classification of the subject matter of the appeal.[159] This review takes place before cases are distributed to judicial panels. Although the panel remains responsible for determining admissibility, preliminary screening can reduce the time required for routine procedural examination and allow greater attention to the substantive issues raised by the appeal.

At the substantive level, the technical office reviews draft judgments for unintended material, linguistic, and formal errors and prepares summaries of the legal principles contained in Court of Cassation judgments. It also conducts legal studies concerning particular or emerging issues, including questions on which judicial or legal opinions differ.[160] These studies are made available to judges as non-binding advisory material.[161] The office may also prepare studies on specific legal questions referred to it by judicial panels and analyse judicial precedents in support of greater consistency in legal principles.[162] The scale and diversity of these functions in 2024 are illustrated in Table 2.

[157] Jordanian Judicial Council 2010, p. 9.
[158] Hashemite Kingdom of Jordan 2010 (as amended), Regulation No. 7 of 2010, Arts. 4(2) and 5(1).
[159] Hashemite Kingdom of Jordan 2010 (as amended), Regulation No. 7 of 2010, Art. 3(1).
[160] Jordanian Judicial Council 2024, p. 33.
[161] Hashemite Kingdom of Jordan 2010 (as amended), Regulation No. 7 of 2010, Art. 3(1).
[162] Hashemite Kingdom of Jordan 2010 (as amended), Regulation No. 7 of 2010, Art. 3(3).

Table 2 Work of the Technical Office of the Court of Cassation in 2024

Activity	Incoming	Completed	Completion rate from incoming
Classification of civil cases	7,078	7,163	101.2%
Legal studies submitted in civil, criminal, customs, and tax cases	1,114	1,302	116.9%
Summarising judgments	14,158	13,664	96.5%
Reviewing judgments	17,639	17,365	98.4%
Other studies	114	117	102.6%
Total	40,103	39,611	98.8%

The reported activities demonstrate a substantial volume of operational support provided by the Technical Office, but they do not by themselves measure the net time saved for judicial panels or the effect of that support on decision quality.

A particularly important characteristic of this model is that the office provides support without transferring judicial authority. Its studies, preliminary observations, and other outputs are advisory and do not bind the judicial panel. The judge therefore remains responsible for examining the appeal, evaluating the legal issues, and reaching the final decision. At the same time, preliminary procedural review and targeted legal research may reduce the time judges spend on supporting tasks and provide additional material for substantive consideration, particularly in the context of the substantial workload of the Court of Cassation.[163]

The Royal Committee for Developing the Judiciary and Enhancing the Rule of Law recommended in 2017 that the technical office of the Court of Cassation be strengthened through additional judges and legal researchers.[164] The model was subsequently expanded by amendments introduced in 2020 to

[163] The periodic annual reports issued by the Jordanian Judicial Council indicate that the workload of the Court of Cassation has remained a significant institutional concern over time. The Council referred to the workload of the Court in its 2010 Annual Report, while the 2024 Annual Report records 15,958 incoming cases and an annual workload of 2,071 cases per judicial panel and 365 cases per judge, See Jordanian Judicial Council 2010, p. 9; Jordanian Judicial Council 2024, p. 32.
[164] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017, p. 44.

permit technical offices in the Courts of Appeal and the High Administrative Court. These offices have since commenced work and perform functions broadly similar to those of the technical office of the Court of Cassation.[165]

The principal limitation of this model concerns its capacity for wider implementation. The effectiveness of human-based technical support depends on the availability of sufficient judges and legal researchers to serve the judicial panels requiring assistance. Annual JJC reports indicate that the reported volume of work undertaken by technical offices in the Courts of Appeal remains more limited than that of the Court of Cassation.[166] These differences may reflect variations in staffing, jurisdiction, caseload, demand, or reporting practices, and the available data do not isolate their respective effects. The availability of sufficient judges and legal researchers nevertheless remains an important practical consideration in extending human-based technical support more widely.

Moreover, this form of institutional support has not been extended to first-instance courts or the Public Prosecution, although both operate under substantial workloads and perform functions requiring significant legal and evidential analysis. This is particularly relevant to first-instance courts because improving the quality and efficiency of adjudication at the earliest judicial stage may reduce the need for extensive appellate correction and thereby ease part of the workload transferred to higher courts.

Technical offices therefore represent a distinctive form of judicial reform. Rather than merely imposing procedural requirements or seeking to develop judges' knowledge in advance, they provide ongoing, task-specific support during judicial work itself. Their experience demonstrates the potential value of direct judicial assistance while also revealing the practical difficulty of extending a human-resource-intensive support model throughout the judicial system.

4.5 Chapter Conclusion

This chapter has examined four principal conventional responses adopted in Jordan to address the challenges identified in Chapters Two and Three: procedural reform, judicial specialisation, continuous judicial training, and technical offices. The analysis indicates that each measure addresses an important dimension of judicial work, but each also has practical and institutional limitations.

Procedural reforms may improve case progression, discourage unnecessary delay, and promote more efficient management of litigation. However, deadlines and case-management measures do not by themselves expand the substantive capacity available to the judges.

Judicial specialisation and continuous training address a different dimension of judicial capacity. Specialisation may strengthen familiarity, efficiency, and consistency within particular areas of law,

[165] Jordanian Judicial Council 2024, pp. 33, 36–37.
[166] Jordanian Judicial Council 2022, p. 26.

but its practical application depends on court size, staffing levels, workload distribution, and the ability to preserve specialised assignments in practice. Continuous training similarly remains an important means of developing judicial knowledge. However, its affect depends on the relevance and practical depth of training content, the time available for participation, and the development of stronger methods for evaluating its longer-term impact on judicial performance.

Technical offices represent a different form of response because they provide direct assistance during the performance of judicial tasks. Their functions demonstrate how particular procedural, research, and review activities can be supported without transferring responsibility for the judicial decision itself. The limitation of this model lies principally in its dependence on additional human resources and, consequently, the difficulty of extending equivalent support across all courts and judicial bodies.

Taken together, these findings show that the conventional reforms examined in this chapter have made important contributions to addressing different aspects of the challenges affecting judicial work. Procedural reform, judicial specialisation, training, and institutional research support each respond to a particular dimension of judicial needs. Nevertheless, the findings indicate that some challenges persist despite these reforms. This does not necessarily mean that the reforms themselves are inappropriate or ineffective, as the continuing effects of some challenges may be associated with factors relating to implementation, resources, continuity, or scope of application, or with limits on the extent to which a particular reform can address a specific type of judicial need.

The persistence of some of these challenges opens the way for examining additional forms of support, particularly in tasks that require substantial time, intensive information processing, or specialised technical knowledge. From this point, the following chapters turn to contemporary developments in AI, the capabilities that these technologies now offer, their relevance to judicial work, and the risks that may arise from their use in this context. This analysis provides the basis for a later examination of whether some of these capabilities may be relevant to the judicial needs identified in the preceding chapters.

5. AI in Judicial Decision-Making: Concepts and Relevant Technologies

The previous chapters identified the principal challenges affecting judicial workload and decision quality in Jordan and examined the benefits and limitations of the main reforms adopted in response. Against this background, the study now turns to AI as a further category of technology whose characteristics and capabilities must first be understood before its potential relevance to judicial decision-making can be assessed.

AI does not refer to a single technology or mode of operation. Different AI systems rely on different computational approaches and produce different forms of output, with important consequences for the judicial tasks to which they may potentially be relevant. A conceptual and functional understanding of these technologies is therefore necessary before their possible benefits, risks, and appropriate conditions of use can be evaluated.

Accordingly, this chapter provides the conceptual and technological foundation for the analysis developed in the subsequent chapters. Section 5.1 examines the concept, definitions, and historical development of AI. Section 5.2 then explains the principal AI technologies relevant to judicial decision-making and their core functional characteristics. The chapter does not seek to determine whether these technologies should be adopted in judicial practice; their potential benefits, risks, and suitability for particular judicial tasks are examined separately in the subsequent stages of the study.

5.1 Concept and Development of Artificial Intelligence

AI does not refer to a single technology, but to a broad and evolving range of computational systems and techniques that share certain characteristics associated with forms of intelligent behaviour.[167] This diversity is particularly important in the present study because different AI technologies operate in different ways and may therefore have different implications when considered in a judicial context.

This section does not attempt to provide an engineering or computer-science analysis of AI. Rather, it establishes the conceptual background necessary for the legal and judicial analysis that follows. Section 5.1.1 considers the principal definitions of AI, while Section 5.1.2 briefly traces its historical development and contemporary scope.

[167] Boucher 2020, p. 1.

5.1.1 Concept and Definitions of Artificial Intelligence

The term artificial intelligence is widely used and well established, yet its precise meaning remains unclear, as there is no single definition that enjoys universal acceptance.[168] One reason for this lack of consensus lies in the rapid development of AI itself and its applications, which makes detailed definitions quickly outdated.[169] In addition, the meaning of AI varies significantly depending on the perspective or framework through which it is viewed.

From the perspective of thinking humanly, AI has been defined as "the exciting new effort to make computers think ... machines with minds, in the full and literal sense".[170] From the perspective of acting humanly, it has been described as "the art of creating machines that perform functions that require intelligence when performed by people".[171]

In addition to these conceptual approaches, more formal and descriptive definitions have also been developed. It has been defined as a field of science in which multiple disciplines, including computer science, computer engineering, philosophy, psychology, mathematics, neuroscience, linguistics, and biology, converge with the aim of creating systems capable of learning, building models based on that learning, making predictions using those models and new data, and then making autonomous decisions or supporting human decision-making based on those predictions and available environmental data.[172]

A widely accepted classical definition describes AI as the field in which machines are developed that can perform tasks which would otherwise require human intelligence.[173] This definition remains particularly useful in applied contexts due to its breadth and practical flexibility.

In addition to academic definitions, formal institutional approaches have also been developed. The European Commission has defined AI as systems that display intelligent behaviour by analysing their environment and taking action, with some degree of autonomy, in order to achieve specific goals.[174] Furthermore, the EU has adopted a more precise legal definition of AI systems, describing them as machine-based systems designed to operate with varying levels of autonomy, which may exhibit adaptability after deployment, and which infer from the inputs

[168] Nowotko 2021, p. 2221.
[169] Nowotko 2021, p. 2221.
[170] Haugeland 1985, p. 2.
[171] Kurzweil 1990, p. 14.
[172] Arias 2022, p. 24.
[173] Matheson 2023, p. 2.
[174] European Commission 2018, COM(2018) 237 final, p. 1.

they receive how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments[175]. These formal legal definitions are particularly significant, as they do not merely describe the concept, but establish binding legal criteria within the framework of the relevant legislation. Accordingly, any system that meets the characteristics set out in such definitions may fall within the scope of the applicable legal rules.

5.1.2 Historical Development and Contemporary Scope of AI

To better understand the diversity of definitions of AI, it is useful to briefly trace its historical development. Although the widespread use of AI applications in recent years may suggest that it is a relatively recent phenomenon, the idea of creating systems capable of simulating certain aspects of human behaviour significantly predates its contemporary applications.

The intellectual roots of this idea can be traced to early philosophical and cultural conceptions concerning the possibility of artificial beings or mechanical devices performing functions traditionally associated with human capabilities.[176] Although these early conceptions did not concern AI in its modern technical sense, they contributed to the underlying idea that certain forms of behaviour and thought might be explained or reproduced mechanically, an idea that later developed into more structured scientific inquiry.[177]

The transition from theoretical conception to scientific investigation began to take clearer shape during the first half of the twentieth century, alongside developments in mathematical logic, theories of computation, and the emergence of modern computers.[178] A major milestone in this development was Alan Turing's 1950 paper, *Computing Machinery and Intelligence*, in which he examined the possibility of machines simulating intelligent behaviour and proposed what became known as the Turing Test as a means of evaluating such behaviour.[179]

A further institutional milestone followed in 1956 with the Dartmouth Conference, which is widely regarded as marking the emergence of AI as an independent scientific field.[180] John McCarthy played a central role in organising the conference and is also credited with coining the term "AI".[181] From this point onwards, the field began to develop as a distinct research

[175] European Union 2024, Regulation (EU) 2024/1689, Art. 3.
[176] Buchanan 2005, p. 53.
[177] Buchanan 2005, p. 54.
[178] Buchanan 2005, p. 54.
[179] Baker, Hobart and Mittelsteadt 2023, p. 7.
[180] Baker, Hobart and Mittelsteadt 2023, p. 7.
[181] Baker, Hobart and Mittelsteadt 2023, p. 7.

programme concerned with building systems capable of performing tasks traditionally associated with human intelligence.

This development was not linear. AI passed through periods of optimism and progress followed by periods of reduced momentum and stagnation.[182] At certain stages, limited computational capacity, insufficient data, and the failure of early expectations to materialise contributed to declining interest and investment in the field, giving rise to periods later described as "AI winters".[183]

As computational capacity improved, data became increasingly available, and algorithms and machine learning techniques advanced, the field began to achieve more substantial practical progress. Over the following decades, applications emerged that demonstrated the ability of computational systems to perform tasks previously regarded as closely associated with human capabilities. Chess became a particularly prominent testing ground because of the strategic planning and reasoning it requires, culminating symbolically in the victory of IBM's Deep Blue over former world chess champion Garry Kasparov in 1997.[184]

During the past two decades, this development has accelerated considerably as a result of advances in computational power, algorithmic development, the rapid expansion of available data, and the growth of machine learning and deep learning techniques.[185] These developments have moved AI beyond relatively limited and specialised applications into a much wider range of scientific, commercial, and institutional uses.

This historical development also reflects the interdisciplinary character of AI. The field has drawn upon contributions from engineering, mathematics and statistics, biology, neuroscience, psychology, philosophy, economics, and linguistics.[186] Over time, AI has not only benefited from these disciplines but has also begun to influence their development and the methods of research and application used within them.[187]

[182] Russell and Norvig 2010, p. 30.
[183] Matheson 2023, p. 2.
[184] Buchanan 2005, p. 54.
[185] Baker, Hobart and Mittelsteadt 2023, p. 8.
[186] Philosophers contributed early ideas about mind, knowledge and reasoning; mathematicians provided tools for logic, probability and computation; economists developed formal models of decision-making; neuroscientists and psychologists contributed models of cognition and information processing; linguists examined language as a structured system; and computer engineers provided the machines that enabled practical AI applications. See Russell and Norvig 2010, pp. 5–16, especially p. 30 for a summary.
[187] Buchanan 2005, p. 54.

In light of this development, it is important not to regard AI as an independent or mysterious force.[188] Rather, it operates through computational systems and technologies designed to process data and perform particular tasks. One of its principal capabilities lies in processing, storing, analysing, and retrieving large volumes of data efficiently, which has contributed significantly to the expansion of its applications.[189]

In its contemporary form, AI is commonly distinguished between narrow or weak AI and strong AI. Most systems currently in use fall within the first category, as they are designed to perform specific tasks or defined groups of tasks. Strong AI, by contrast, refers to the theoretical possibility of systems possessing a general capacity to perform a wide range of tasks at a level comparable to human intelligence. Such systems remain theoretical and have not yet been achieved in current AI technologies.[190]

5.2 AI Technologies Relevant to Judicial Decision-Making

AI technologies relevant to judicial decision-making can be grouped, for analytical purposes, into several overlapping technological families, including rule-based and expert systems, machine learning, natural language processing, multimodal and speech-based systems, and emerging agentic AI systems.[191] These categories are not mutually exclusive. Modern AI applications frequently combine several of these technologies; for example, language models generally rely on machine learning and deep learning, while multimodal systems may integrate language processing, computer vision, and speech technologies.

The classification adopted in this section is therefore functional rather than exhaustive. Its purpose is to explain the principal technological approaches that are relevant to judicial tasks and to clarify how their core operational characteristics differ. This provides the technical foundation necessary for the later assessment of their potential suitability, benefits, and risks in judicial decision-making.

5.2.1 Rule-Based and Expert Systems

Rule-based systems and expert systems are among the earliest AI technologies developed to support decision-making processes. They rely on predefined logical rules that guide the system

[188] Reddy 2022, p. 1767.
[189] Foit 2022, p. 47.
[190] Boucher 2020, p. 13.
[191] Arias 2022, p. 25.

toward specific outputs. Rule-based AI is the simplest form of AI and is now considered a traditional approach within the field of AI.[192] Rule-based systems form part of the broader tradition of symbolic AI, which dominated AI research from the 1950s through the 1990s. Despite the rise of modern techniques such as machine learning and artificial neural networks, rule-based systems continue to be used in various domains, ranging from simple control systems such as thermostats to advanced robotics applications.[193]

In essence, rule-based AI operates through structured logic trees built around "if–then" statements. As Campbell explains, this approach "involves the building of sophisticated logic trees, incorporating 'if A, then B' kind of orders."[194] The "if" component represents a condition, while the "then" component represents the resulting action. For example, if an animal is active at night, then it is classified as nocturnal.[195] Once a fact or condition is identified, the system applies the relevant predefined rule. Accordingly, a rule-based system is generally composed of two core elements: factual information about the situation and the rules governing how these facts are processed. In some cases, a third component is included, namely a termination criterion, which determines when a solution has been reached or when no valid solution exists, thereby preventing infinite loops.[196]

From an operational perspective, rule-based systems do not independently formulate the rules through which they reason. Instead, their reasoning structure is predefined by human designers or domain experts who translate relevant knowledge into explicit rules that the system can apply.[197] Expert systems frequently employ this rule-based architecture in order to represent and apply specialised human knowledge within a defined domain.[198] The terms are therefore closely related but not strictly synonymous: rule-based reasoning describes a method of computation, whereas an expert system refers more broadly to a system designed to reproduce or support aspects of expert problem-solving.

In legal contexts, any system that replicates or simulates the analytical reasoning of a legal expert can be described as a legal expert system.[199] These systems are primarily used for relatively structured and repetitive legal tasks.[200] Indeed, expert systems remain among the

[192] Grosan and Abraham 2011, p. 149.
[193] Boucher 2020, p. III.
[194] Campbell 2020, p. 326.
[195] Reddy and Fields 2022, p. 168.
[196] Grosan and Abraham 2011, p. 150.
[197] Kasap 2021, p. 212.
[198] Matheson 2023, p. 3.
[199] Timmer and Rietveld 2019, p. 520.
[200] Matheson 2023, p. 3.

most widely applicable AI tools in legal practice, particularly because most routine legal work is highly codified and rule-based systems are well suited to such structured environments.[201]

One of the principal characteristics of rule-based systems is their relative interpretability. Compared with many data-driven AI models, their outputs can generally be traced through the explicit rules and logical steps applied by the system, making them less susceptible to the type of opacity commonly associated with the "black box" problem.[202]In highly complex systems, tracing a large number of interacting rules may still be difficult in practice, but the underlying reasoning path remains, at least in principle, inspectable. This characteristic is particularly significant in legal and judicial contexts, where the basis of technologically supported outputs may need to be understood, scrutinised, and justified by human decision-makers.[203]

This interpretability also aligns with the adversarial nature of legal proceedings, where competing arguments must be examined in detail before a final decision is reached. In practice, rule-based legal systems can assist in tasks such as verifying the admissibility of claims, checking compliance of legal documents with predefined standards, or supporting preliminary legal analysis.

Moreover, such systems can be applied in contract analysis, where predefined rules assess whether contractual clauses comply with statutory requirements or established case law.[204] Rule-based systems can also assist in evaluating legal arguments by verifying whether the factual conditions underlying a claim are met. They can apply multiple interconnected rules before reaching a conclusion.[205]

At a broader level, rule-based systems operate through step-by-step deduction and are particularly suitable for problems that follow predefined reasoning structures. Their effectiveness therefore depends heavily on the clarity, completeness, and formalization of expert knowledge, which must remain understandable to both developers and end users.

However, despite these advantages, rule-based systems also have important limitations. First, they are inherently sequence-dependent and therefore only suitable for problems that can be expressed through "if–then" logic.[206] Many complex or unique legal issues cannot easily be

[201] Matheson 2023, p. 4.
[202] Timmer and Rietveld 2019, p. 524.
[203] Pérez Gómez 2022, p. 20.
[204] Pérez Gómez 2022, p. 27.
[205] Pérez Gómez 2022, p. 26.
[206] Grosan and Abraham 2011, p. 149.

reduced to fixed rules and instead require contextual human judgment and practical experience.[207] Furthermore, these systems are relatively rigid, as they are limited to the knowledge encoded into them at the time of development.[208]

Another significant limitation is the continuous effort required to maintain and update them.[209] Human experts must regularly revise the system to incorporate new legal rules, interpretations, or changes in legislation.[210] Additionally, when the number of rules becomes too large, system efficiency may decrease, making it less suitable for overly broad or complex domains.[211]

Historically, these systems were also criticised in legal contexts for requiring significant maintenance resources and for failing to fully replicate the nuanced reasoning of human legal experts. However, such limitations are closely linked to the technological and institutional context in which they were originally developed, particularly when legal information was largely paper-based and legal systems were far less digitised than they are today.[212]

A further technical challenge lies in the representation of legal knowledge in a way that balances expressive richness with computational efficiency.[213] Legal language is inherently ambiguous and translating it into structured rules while preserving its legal meaning remains a significant difficulty. Ensuring accuracy also requires systematic validation against real cases, doctrinal interpretations, and statutory sources.[214]

The most persistent limitation of rule-based systems is their difficulty in handling novel legal arguments or unexpected factual variations that fall outside predefined rules.[215] For this reason, hybrid approaches combining rule-based reasoning with machine learning techniques are increasingly seen as a promising direction.[216] Timmer and Rietveld (2019) reported plans by Dutch legal publishers to develop software combining rule-based document construction with data-driven suggestions of relevant case law.[217]

[207] Matheson 2023, p. 6.
[208] Matheson 2023, p. 6.
[209] Kasap 2021, p. 212.
[210] Kasap 2021, p. 212.
[211] Grosan and Abraham 2011, p. 149.
[212] Timmer and Rietveld 2019, p. 521.
[213] Pérez Gómez 2022, p. 19.
[214] Pérez Gómez 2022, p. 20.
[215] Pérez Gómez 2022, p. 21.
[216] Pérez Gómez 2022, p. 21.
[217] Timmer and Rietveld 2019, p. 533.

Despite these limitations, rule-based systems continue to evolve and remain relevant, particularly when integrated with other forms of AI.[218] In this regard, system scope is a crucial consideration. While it is theoretically possible to encode broad legal domains, in practice, the effectiveness of rule-based systems depends on avoiding excessive generalisation.[219] Overuse of a single system across multiple legal domains may lead to inefficiency or insufficient coverage of specialised legal areas. Consequently, many institutions prefer to develop domain-specific expert systems focused on recurring legal problems.[220] Finally, the involvement of legal experts remains essential in verifying and evaluating system outputs, particularly in complex cases involving layered reasoning or discretionary judgment.[221] Despite their limitations, rule-based systems continue to offer significant value in legal practice, and the legal sector has not yet fully exploited their potential.[222]

5.2.2 Machine Learning and Deep Learning

Machine learning (ML) is one of the most important, applied branches of AI. It has a major impact on modern technological developments, especially in fields that require processing large volumes of data and making complex inferential decisions.[223] This field is based on a core idea: enabling computer systems to learn from data, detect patterns, and identify statistical relationships. This allows them to produce outputs, make decisions, or provide predictions without being explicitly programmed for each individual case.[224]

In this context, this represents a fundamental shift compared to traditional rule-based systems. Rule-based systems apply rules that are explicitly encoded by programmers. Machine-learning systems, by contrast, estimate patterns and relationships from data according to a specified learning objective rather than relying solely on predefined rules.[225]

A practical example of this approach is a spam email filtering system. The system stores emails that were previously classified as spam. When a new email arrives, it is not only checked against this stored list. Instead, the system analyses past emails and extracts words or patterns

[218] Reddy and Fields 2022, p. 171.
[219] Pérez Gómez 2022, p. 29.
[220] Pérez Gómez 2022, p. 29.
[221] Pérez Gómez 2022, p. 29.
[222] Matheson 2023, p. 16.
[223] Domingos 2012, p. 79.
[224] Campbell 2020, p. 326.
[225] Campbell 2020, p. 326.

that indicate spam. It then uses these patterns to classify new emails. In this way, it can deal with data it has never seen before.[226]

These systems are highly effective in sorting unwanted messages, although they may sometimes classify legitimate emails as spam. In some systems, user corrections may be used as feedback for online learning or later retraining, while in others the deployed model remains fixed and the correction affects only local filtering settings. Post-deployment adaptability therefore depends on system design rather than being an inherent feature of machine learning.[227]

AI research has developed through partly overlapping traditions, including symbolic, statistical, and data-driven approaches. Over time, advances in available data, computational capacity, and statistical methods increased the practical importance of machine-learning approaches, particularly in tasks where relationships could be estimated from examples rather than fully specified through explicit rules.[228]

ML is a branch of AI because the ability to transform experience into knowledge and discover meaningful patterns in complex data is a core aspect of human intelligence.[229] AI has undergone a gradual conceptual shift from "pre-programmed knowledge" to "data-driven learning," driven by advances in statistical methods and ML models.[230] However, this shift remained limited in practical impact for years. It was the emergence of big data, along with rapid progress in computational power, especially graphics processing units, and advances in statistical algorithms and deep learning models, which created a turning point. This moved ML from a narrow research area to a widely used core technology.[231]

This development enabled efficient processing of massive and complex datasets, sometimes exceeding human capabilities. This is evident in medical record analysis, genetic data, and astronomical data.[232] It is also used in traffic management, and experimental sciences such as biology and neuroscience.[233]

Accordingly, ML can be divided into three main types, depending on the nature of the data and the learning method. Supervised learning, in this type, the system is trained on data that

[226] Shalev-Shwartz and Ben-David 2014, p. 19.
[227] Shalev-Shwartz and Ben-David 2014, pp. 286–287.
[228] Jordan and Mitchell 2015, p. 255.
[229] Shalev-Shwartz and Ben-David 2014, p. 24.
[230] Zekos 2022, p. 203.
[231] Jordan and Mitchell 2015, p. 256.
[232] Shalev-Shwartz and Ben-David 2014, p. 22.
[233] Jordan and Mitchell 2015, pp. 256–257.

contains both inputs and correct outputs.[234] In other words, it learns from fully labelled examples. In the email example mentioned earlier, the system is trained using emails labelled as spam or not spam. Based on this data, it learns a rule that allows it to classify new emails when they arrive.[235] The goal here is to predict missing information in new data.

In a legal context, this can be applied to case data that includes facts and final judgments. The model learns the relationship between facts and outcomes, so it can later predict the outcome of a new case based on similar patterns. This type is widely used in legal applications such as judgment prediction, case classification, and risk assessment.[236]

Unsupervised learning, in this type, the system is not provided with correct answers. Instead, it receives unlabelled data and is asked to find patterns and internal relationships.[237] It may group similar data together or detect hidden structures within it.[238] In the email example, the system receives a large set of unlabelled emails. Its task is to identify unusual or abnormal messages.[239] The goal is to extract a simplified representation of the data.

The future of unsupervised learning is expected to be highly important. Human and animal learning is largely unsupervised. Humans understand the structure of the world by observing it, not by receiving labels for everything.[240] In the legal field, this method can be used to analyse judicial trends or group similar cases without direct human classification.[241]

Reinforcement learning, in this approach, the system receives feedback during training in the form of a reward signal. This signal indicates how good an action was, without explicitly providing the correct alternative. In more complex cases, a sequence of actions is evaluated as a whole, without separating the contribution of each action.[242] Although these three paradigms, supervised, unsupervised, and reinforcement learning, are commonly used to structure the field, many recent studies adopt hybrid approaches that combine them.[243]

Deep learning is an advanced extension of ML. It is based on artificial neural networks with multiple layers. Compared with many traditional machine-learning approaches, deep-learning methods can reduce the need for manual feature engineering by learning useful representations

[234] Shalev-Shwartz and Ben-David 2014, pp. 22–23.
[235] Shalev-Shwartz and Ben-David 2014, pp. 22–23.
[236] Medvedeva, Wieling and Vols 2023, p. 207.
[237] Jordan and Mitchell 2015, p. 258.
[238] Shalev-Shwartz and Ben-David 2014, p. 307.
[239] Shalev-Shwartz and Ben-David 2014, p. 23.
[240] LeCun, Bengio and Hinton 2015, p. 442.
[241] V and Raghuveer 2013, pp. 27–28.
[242] Jordan and Mitchell 2015, p. 258.
[243] Jordan and Mitchell 2015, p. 258.

from data.[244] This process nevertheless remains dependent on human choices concerning the data, model architecture, learning objectives, training, and evaluation.

Deep learning has achieved major progress in solving problems that were difficult for AI for many years. It is effective in discovering complex structures in high-dimensional data. It has also achieved record performance in image recognition, speech recognition, and natural language processing, especially in topic classification, sentiment analysis, question answering, and translation.[245]

In the judicial field, deep-learning methods can be used to extract semantic features from legal texts and compare cases on the basis of their facts and underlying legal principles. These representations can then be used to measure similarity and identify cases that are relevant to the matter under review.[246] The most similar cases are presented first, helping judges and lawyers quickly access relevant precedents and saving time in legal research.

Despite its major benefits, ML faces several challenges. The most important include bias: if historical data contains biased patterns, the model may reproduce or amplify them, depending on the data, modelling choices, and context of deployment.[247] Another challenge is explainability: it is sometimes difficult to explain how a model reached a specific decision.[248] These risks and others will be examined in a separate section, as they require detailed discussion due to their importance in the judicial context.

5.2.3 Natural Language Processing Systems

Natural Language Processing (NLP) is considered one of the core branches of AI. It aims to enable computers to understand, analyse, interpret, and generate human language, whether written or spoken, in a manner that approximates human understanding.[249] NLP can be viewed as a bridge between natural human language and the formal language used by computer systems, as it transforms unstructured linguistic data into representations that can be processed computationally.[250]

Understanding human language remains one of the most complex challenges in computer science. Yoav Goldberg explains that humans are highly skilled at using and understanding

[244] Jordan and Mitchell 2015, p. 257.
[245] LeCun, Bengio and Hinton 2015, p. 436.
[246] Anitha, Krupasagari and Shahin 2025, pp. 2659–2661.
[247] Shamsan Saleh, AlMurtadha and Elfaki 2026, p. 2.
[248] Boucher 2020, p. III.
[249] Khurana et al. 2023, p. 3714.
[250] Van Ruymbeke et al. 2026, p. 4.

language, yet they often struggle to formally describe the rules governing it.[251] This makes the development of systems capable of understanding and generating language an inherently difficult task. The difficulty is further increased by the compositional nature of language, where letters form words and words form sentences, but the meaning of a sentence is not simply the sum of the meanings of its individual words. Rather, meaning emerges from complex structural and contextual relationships between them.[252] NLP systems also face the problem of data sparsity, since the possible combinations of words are nearly infinite, while language itself constantly evolves through the emergence of new terms, expressions, and linguistic patterns.[253]

Daniel Jurafsky and James H. Martin further emphasize that NLP involves multiple levels of linguistic knowledge, including phonology, morphology, syntax, semantics, pragmatics, and discourse.[254] This demonstrates the complexity faced by computational systems attempting to process and understand human language accurately.[255]

NLP systems are generally divided into two main categories: Natural Language Understanding and Natural Language Generation.[256] The first focuses on analysing texts and extracting meanings, entities, and relationships from them, and is commonly used in tasks such as legal document classification, information extraction, legal search, and citation analysis.[257] The second focuses on generating new coherent text, including summarisation, paraphrasing, question answering, and legal drafting.[258]

Within this context, modern language models, particularly Large Language Models (LLMs) and Small Language Models (SLMs), represent an advanced stage in NLP development. These models rely on deep learning techniques, especially Transformer architectures, and are trained on massive amounts of textual data in order to learn linguistic patterns, contextual relationships, and text generation capabilities that resemble human language production.[259]

Large language models are distinguished by their ability to perform a broad range of tasks without requiring separate task-specific training, including legal text analysis, question answering, and legal drafting. Smaller language models, by contrast, are designed to achieve

[251] Goldberg 2017, p. 1.
[252] Goldberg 2017, p. 1.
[253] Goldberg 2017, p. 1.
[254] Jurafsky and Martin 2008, p. 5.
[255] Jurafsky and Martin 2008, p. 5.
[256] Khurana et al. 2023, p. 3714.
[257] Khurana et al. 2023, p. 3714.
[258] Khurana et al. 2023, p. 3714.
[259] Dehghani et al. 2025, pp. 1–10.

greater efficiency in terms of computational resources and speed, making them more suitable for environments with limited technical capabilities. Nevertheless, these models remain part of the broader NLP framework rather than independent systems, as they primarily extend and enhance language understanding and generation capabilities.[260]

The origins of NLP can be traced back to the 1950s, alongside the early development of AI. Since language was closely associated with reasoning and human intelligence, NLP became central to discussions about intelligent machines.[261] Early approaches relied heavily on rule-based systems grounded in linguistic rules. However, these systems struggled to deal with ambiguity and contextual variation, leading to their gradual decline.[262] By the late 1980s, statistical approaches emerged due to increasing computational power and the availability of digital data. This transition later evolved into machine learning and deep learning approaches.[263]

NLP is therefore closely linked to machine learning, which provides the methodological framework for most modern systems, while deep learning represents the most advanced stage of this development.[264] NLP systems generally involve the processing and linguistic analysis of text, its transformation into numerical representations that can be processed computationally, and the application of machine-learning methods to tasks such as classification, prediction, and information or meaning extraction.[265]

In the legal field, NLP has particular importance because law itself is fundamentally expressed through natural language.[266] NLP technologies are therefore used in analysing legislation, judicial decisions, contracts, and other legal documents.[267] These applications support legal research, information extraction, text summarisation, document analysis, and certain forms of legal prediction.[268]

Legal texts can generally be divided into several categories, including constitutional texts, legislation, judicial decisions, administrative regulations, and contracts.[269] These categories differ in their structure and consistency, which may affect the way in which they can be

[260] Dehghani et al. 2025, pp. 1–10.
[261] Jurafsky and Martin 2008, pp. 9–15.
[262] Arias 2022, p. 25.
[263] Goldberg 2017, p. 1.
[264] Goldberg 2017, p. 1.
[265] Nay 2018, pp. 4–5.
[266] Nay 2018, p. 1.
[267] Nay 2018, p. 1.
[268] Frankenreiter and Nyarko 2023, pp. 85–87.
[269] Nay 2018, pp. 2–3.

processed computationally. Judicial decisions present particular challenges because relevant information is often embedded in lengthy and complex textual narratives, including facts, parties, legal reasoning, and the judgment itself.[270] Contracts may vary considerably in complexity, but relatively standardised and predictable contractual documents are particularly amenable to automated review, including the extraction and comparison of individual clauses and provisions.[271]

In this regard, Jens Frankenreiter and Julian Nyarko argue that legal texts do not all possess the same degree of structural consistency, which requires AI systems to account for the nature of each type of legal text when designing legal NLP models.[272] Although modern AI systems have become significantly more capable of handling long and complex legal texts, relying on a single unified model for all forms of legal language may still lead to variations in accuracy and effectiveness.[273]

The same authors further argue that NLP techniques tend to perform best in tasks where sufficient training data is available, since prediction tasks then become largely statistical inference problems based on identifying patterns within the data. This is particularly visible in routine cases involving similar factual scenarios.[274] However, such success remains limited when deeper legal reasoning is required, because automated legal reasoning depends not only on linguistic processing, but also on understanding the underlying legal ontology reflected in legal language itself.[275]

Despite the remarkable progress of NLP technologies, they still face several structural and ethical challenges, especially in the legal domain. Modern language models are generally trained on massive internet-based datasets that do not necessarily represent society fairly or accurately.[276] Instead, they may reproduce existing social biases and stereotypes embedded in online data.[277] In addition, such datasets are often insufficiently documented, making it difficult to identify sources of bias or hold systems accountable for their outputs.[278]

[270] Adhikary et al. 2026, p. 246.
[271] Dale 2019, p. 214.
[272] Frankenreiter and Nyarko 2023, pp. 85–87.
[273] Frankenreiter and Nyarko 2023, pp. 85–87.
[274] Frankenreiter and Nyarko 2023, pp. 89–90.
[275] Frankenreiter and Nyarko 2023, pp. 89–90.
[276] Bender et al. 2021, p. 614.
[277] Bender et al. 2021, p. 614.
[278] Bender et al. 2021, p. 614.

These challenges become even more significant in legal applications because legal datasets are often limited, fragmented, and difficult to organise systematically.[279] Judicial data, for example, frequently suffers from what scholars describe as "selective availability of information," since available datasets usually include only disputes that reached litigation, while straightforward or unresolved cases remain excluded. This creates imbalanced representations that may negatively affect the neutrality and reliability of predictive models.[280]

Specialised legal benchmarks now exist, including LegalBench and ArabLegalEval.[281] However, their scope and evaluation settings limit what can be inferred about judicial use in Jordan. LegalBench primarily evaluates legal reasoning through tasks developed largely in English, while ArabLegalEval focuses on Arabic legal knowledge using tasks derived from Saudi legal materials. Performance on these benchmarks therefore does not establish reliability in Jordanian law, Arabic case files, or actual judicial working conditions, making task- and jurisdiction-specific evaluation necessary. Moreover, fluent and convincing output does not establish the correctness of legal interpretation, the soundness of reasoning, or the reliable use of legal authority.[282]

Recent literature has also highlighted the environmental and financial costs associated with training large language models, due to their extensive energy consumption and computational requirements, in addition to concerns related to bias, misuse, misinformation, and the generation of misleading content.[283]

For these reasons, the literature increasingly calls for a more responsible approach to developing NLP systems.[284] This includes improving data curation and documentation practices, integrating ethical, social, and environmental considerations into system design from the earliest stages, and adopting methodologies aimed at proactively evaluating risks and biases.[285]

[279] Frankenreiter and Nyarko 2023, pp. 87–88.
[280] Frankenreiter and Nyarko 2023, pp. 87–88.
[281] Guha et al. 2023, LegalBench: A Collaboratively Built Benchmark for Measuring Legal Reasoning in Large Language Models; Hijazi et al. 2024, ArabLegalEval: A Multitask Benchmark for Assessing Arabic Legal Knowledge in Large Language Models, pp. 225–249.
[282] Bender et al. 2021, p. 615.
[283] Bender et al. 2021, p. 612.
[284] Bender et al. 2021, pp. 618–619.
[285] Bender et al. 2021, pp. 618–619.

5.2.4 Multimodal AI Systems, Speech Technologies, and Agentic AI Architectures

As AI continues to evolve, its applications have expanded beyond traditional Natural Language Processing (NLP) into more integrated and complex frameworks, including Multimodal AI systems, speech technologies, and emerging agentic AI architectures. These developments collectively reflect a shift from isolated data processing toward more holistic and context-aware computational systems.

Multimodal AI Systems combine text, audio, images, and video in order to achieve a more comprehensive understanding of information.[286] These systems rely on deep learning, computer vision, and language models, and attempt to imitate the human ability to interpret the world through multiple interconnected sources of information rather than isolated data streams.[287]The literature on multimodal machine learning explains that the objective is not merely to process different forms of data separately, but to build models capable of linking and interpreting relationships between texts, sounds, and visual information.[288] At the same time, Automatic Speech Recognition systems have undergone major improvements due to deep learning techniques, significantly reducing error rates compared to traditional systems. end-to-end automatic speech recognition models have emerged as a prominent approach, using unified neural architectures that directly convert speech into text without relying on separate acoustic and language models.[289] These developments have improved the efficiency and applicability of speech recognition technologies.[290] In the judicial context, such technologies can support tasks such as transcribing court hearings, analysing audio and visual digital evidence, and organizing legal documentation and pleadings.

Beyond multimodal and speech-based systems, recent developments in AI have introduced the concept of agentic AI architectures. These systems are characterized not only by their ability to process information but also by their capacity to plan, reason, and execute multi-step tasks through interaction with external tools and environments.[291] Unlike traditional AI models that generate outputs in response to isolated inputs, agentic systems operate in a more autonomous

[286] Baltrušaitis, Ahuja and Morency 2019, p. 423.
[287] Baltrušaitis, Ahuja and Morency 2019, p. 423.
[288] Baltrušaitis, Ahuja and Morency 2019, p. 423.
[289] Prabhavalkar et al. 2024, p. 325.
[290] Prabhavalkar et al. 2024, p. 325.
[291] Murray 2026, p. 290.

and goal-oriented manner, often coordinating multiple sub-tasks to achieve a defined objective.[292]

5.3 Chapter Conclusion

This chapter has established the conceptual and technological foundation for examining AI in judicial decision-making. It has shown that AI does not constitute a single technology, but encompasses different and often overlapping approaches, including rule-based and expert systems, machine learning and deep learning, natural language processing and language models, and multimodal, speech-based, and agentic systems. These technologies differ substantially in their mechanisms, capabilities, and limitations.

These differences are important for the subsequent analysis because the suitability of AI cannot be assessed in the abstract. Rather, particular technologies must be examined in relation to particular judicial tasks. The following chapters therefore build on this conceptual foundation to assess the potential applications, effectiveness, and risks of AI in judicial decision-making.

[292] Tibbetts and Jones 2026, p. 1.

6. Ethical and Judicial Risks of AI in Judicial Decision-Making

A growing range of AI systems has been developed for legal and judicial contexts, including tools for legal consultation, legal research and case analysis, risk assessment, decision support, and predictive applications. Their potential attraction to justice systems lies particularly in their capacity to process information, support particular judicial tasks, and potentially improve the efficiency and accessibility of judicial services.[293] The extent to which these potential benefits can actually be realised, however, depends on the nature of the tool, the task for which it is used, and the conditions governing its deployment.

The integration of AI into judicial decision-making is accompanied by a range of risks and concerns. Some arise from the characteristics and operation of AI systems themselves, others from the manner in which they are used, and others from the particular legal and institutional requirements of judicial decision-making. Identifying these risks is therefore necessary for assessing the potential benefits and harms of different AI applications and for determining the conditions under which their use may or may not be acceptable.

Judicial decision-making is particularly sensitive to such risks because errors or inappropriate technological influence may affect fundamental rights and judicial guarantees, including equality before the law, access to justice, judicial independence, and the right to a fair trial. These principles are protected by the Jordanian Constitution and relevant international standards. Any significant impairment of judicial integrity may also affect public confidence in the administration of justice.[294] AI applications in judicial decision-making therefore require particularly careful assessment before and during their use.

Studying the risks associated with AI integration in judicial decision-making is not a one-time effort that precedes implementation, but rather a continuous process carried out before, during, and after the use of these tools. Practical experience often reveals challenges that theoretical studies cannot fully anticipate, especially given the constant evolution of AI technologies. Continuous research is therefore essential to keep pace with these developments and to ensure that judicial systems remain both effective and safe from unintended consequences.

[293] **See** Susskind 2019, p. 299.
[294] Barysė 2022, pp. 1–2.

This chapter adopts an analytical and empirical approach to examine AI-related risks and their potential implications for judicial decision-making.[295] It combines relevant literature and comparative experience with interviews conducted with Jordanian judges in a pre-deployment context. The analysis is guided by three related questions: first, what are the principal risks identified in the literature as relevant to AI-assisted judicial decision-making? Second, how are these risks perceived by Jordanian judges before the formal deployment of AI within judicial decision-making? Third, to what extent do judicial perceptions converge with or differ in emphasis from the risks identified in the literature, and how may relevant theoretical concepts help to interpret the patterns observed?

6.1 Risks Identified in Literature

The literature identifies a range of risks associated with AI in judicial decision-making. This study organises them into two interrelated categories according to their principal manifestation. Operational risks concern the performance of judicial tasks and the use of AI outputs, including inaccuracy and overreliance. They may arise from system limitations, user behaviour, or working conditions. Structural risks concern the broader institutional and normative implications of AI use, including its effects on judicial independence, transparency, equality, and individualised justice. The categories may overlap and are used to organise the literature and its comparison with the interview findings.

6.1.1 Structural Risks of AI in Judicial Decision-Making

This section addresses the broader Structural implications of AI integration in judicial systems.

6.1.1.1 Judicial Independence

Historically, judges have been distinguished by a high degree of independence in their judicial functions, and constitutions, laws, and customs have guaranteed this independence, which is considered essential for ensuring the fairness of judicial rulings. However, breaching this judicial independence has always been an aspiration of many political and economic forces seeking to impose their influence on the justice sector.[296] In the Jordanian Constitution, Article

[295] Parts of this chapter draw on the author's related research: Alqatawna, Ammar, “Risks of Using Artificial Intelligence in Jordanian Judicial Decision-Making,” International Journal for Court Administration, forthcoming.
[296] Satterthwaite 2025, p. 15.

(97) stipulates that judges are independent and subject to no authority in their judgments other than the law. This independence is manifested through legislative and criminal guarantees that criminalize threatening, blackmailing, or influencing judges in any form. It is observed that the quality and fairness of judicial rulings are closely tied to the degree of independence enjoyed by the judge issuing them. This matter needs no further confirmation, for a judge who is not subjected to influence, or pressure is more likely to reach a fair ruling based on the requirements of the law and the principles of justice. Any attempt to undermine judicial independence has grave consequences that begin to appear in the fairness of the rulings issued and extend to affect the reputation of the judiciary, public trust, economic growth, and other matters directly or indirectly influenced thereby.

The use of AI tools in judicial decision-making may raise risks to judicial independence, particularly where systems are designed, supplied, trained, or controlled by actors outside the judiciary. Private developers or public authorities may influence system objectives, design choices, training data, or deployment conditions in ways that do not necessarily correspond with the values and requirements of judicial decision-making.[297] This concern has also been highlighted by the United Nations Special Rapporteur on the independence of judges and lawyers, who stated that "judicial independence may be undercut by the influence exerted by political branches of government and even by private companies in the design, development, training and deployment of AI solutions used in judicial systems."[298] The same report identified the possibility of pressure on judges who depart from automated or AI-assisted recommendations,[299] as well as broader risks arising where technological systems are used for institutional monitoring, performance management, surveillance, or other forms of influence over judicial activity.[300]

Similar concerns arise in relation to the data on which AI systems depend. Data may contain existing biases or may be selected, structured, or managed in ways capable of influencing the outputs produced by the system.[301] The significance of this risk depends substantially on the function assigned to AI within judicial decision-making. A system used for limited legal research may influence the materials presented to a judge by prioritising some sources over others, whereas systems that generate legal reasoning, recommendations, or proposed

[297] Artigot i Golobardes, Grasso, Iamiceli and Maugeri 2024, pp. 71–72.
[298] Satterthwaite 2025, p. 5, para. 12.
[299] Satterthwaite 2025, p. 5, para. 12.
[300] Satterthwaite 2025, p. 5, para. 12.
[301] Canadian Judicial Council 2024, p. 6.

judgments may exert a considerably more direct influence. The risk to judicial independence should therefore be assessed according to the nature of the task, the degree of system autonomy, and the transparency of its operation.

Within this context also falls the use of AI tools designed to unify judicial approaches and opinions on certain cases. An example is found in several Chinese courts that have integrated AI into judicial processes under the declared aim of promoting standardization. These AI tools monitor and assess judges' rulings, thereby incentivizing alignment with the outputs of such tools.[302] This practice is considered part of political oversight of the judiciary and restricts its independence.[303] Furthermore, the emergence of predictive AI tools that assess judges' work, orientations, and legal reasoning creates a general impression of a judge's tendencies, producing undesirable pressure on judges to avoid falling within the scope of such predictions.[304] This constitutes another form of encroachment upon judicial independence. Confidentiality is also relevant to judicial independence where AI use exposes draft judgments or other protected judicial information to unauthorized access or misuse. Such exposure may enable monitoring or pressure on judges before a decision is issued.

6.1.1.2 Transparency and Explainability

Judicial transparency operates through several distinct mechanisms: public hearings, access to case records, reasoned judgments, and opportunities for judicial review and appeal. Public hearings permit scrutiny of proceedings, subject to applicable exceptions, but do not themselves establish unrestricted access to case documents.[305] Access to those documents remains governed by procedural and confidentiality rules, while reasoned judgments explain the basis of the court's decision and enable its examination and challenge.

Moreover, judicial decisions, whether preparatory, preliminary, or final, are reasoned and motivated. The Jordanian legislator obliges judges, when issuing their rulings, under Article 160 of the Code of Civil Procedure, to include the reasons and grounds upon which the

[302] Shi 2022, p. 125; see also Satterthwaite 2025, pp. 17–18.
[303] Satterthwaite 2025, pp. 11–18.
[304] Sourav 2025, p. 3.
[305] Article 101(3). of the Constitution of the Hashemite Kingdom of Jordan stated that "Courts sessions are public unless the court decides that they should be secret in consideration of public order or morals and in all cases the verdict shall be pronounced in an open session." Hashemite Kingdom of Jordan 1952 (as amended), Constitution, Art. 101(3).

judgment is based. Otherwise, the judgment is considered flawed due to lack of reasoning, which may lead the higher court to annul it, since this flaw affects the soundness of the judicial decision even if its outcome is correct. All of this is an integral part of the transparency system reflecting the procedures and decisions of the judiciary.[306] Providing reasons for judgments is also of utmost importance for the parties to understand how judges reached the final decision. These reasons clarify how the judge arrived at the ruling, which can enhance the parties' sense of justice, convince many of them of the judgment's outcome, and discourage them from appealing it. It also helps the parties exercise their right to challenge the decision by highlighting the reasons they may consider incorrect, presenting these reasons as points for appeal. For this reason, reasoned judgments are considered a safeguard of a fair trial.[307] On the other hand, reasoning and motivation in judgments reflect judicial trends and reasoning in the matters before the court. The outcome of a decision is specific to each case and does not always reveal the court's position on the issue or its cause, a role fulfilled by legal reasoning and motivation. Furthermore, reasoning and motivation are necessary to enable direct judicial review of decisions by the higher courts by examining the grounds and bases upon which a judgment is founded.[308] They are also necessary to provide indirect oversight for legal scholarship, which usually plays a vital role in developing and improving judicial reasoning through commentary on court decisions and the bases upon which they are built. Overall, providing reasons for judgments is a safeguard against arbitrary and unreasonable decisions and serves the concept of the rule of law.[309] Thus, it becomes clear that reasoning and motivation of judicial decisions are a core issue affecting the guarantees of a fair trial for the parties and contribute to judicial and non-judicial oversight of judgments, representing a form of transparency required in the justice sector. Nevertheless, judges are obliged to provide reasons that address the decisive arguments influencing the case outcome, though not every point raised must be addressed. The scope of reasoning varies with the decision's nature and

[306] Hashemite Kingdom of Jordan 1988 (as amended), Code of Civil Procedure No. 24 of 1988, Art. 160; see also Court of Cassation (Jordan) 2024, Civil Cassation Judgment No. 5372/2024 (Civil Division).
[307] At the European level, the duty to state reasons is grounded in Article 6 of the *European Convention on Human Rights* and Article 47 of the *Charter of Fundamental Rights of the European Union*. Although not expressly provided, both the European Court of Human Rights (ECtHR) and the Court of Justice of the European Union (ECJ) have recognised it as an essential element of the right to a fair trial, often referred to as the right to a reasoned judgment ((European Convention on Human Rights, Art. 6(1); Charter of Fundamental Rights of the European Union, Art. 47; García Ruiz v Spain [GC], App. No. 30544/96, ECtHR, 21 January 1999, para. 26; HYA and Others, Case C-349/21, CJEU, 16 February 2023, paras. 55, 59–61; CCJE 2008, Opinion No. 11, para. 35.).
[308] Court of Cassation (Jordan) 2021, Civil Cassation Judgment No. 3488/2021 (Civil Division).
[309] Hendrickx 2025, p. 3.

circumstances, and in some cases, judges may rely on lower court reasoning or implicit rejection of arguments.[310]

AI use may complicate judicial transparency because the basis of an output can be difficult to examine. This opacity may arise from commercial secrecy, the technical complexity of the model, or users' limited understanding of its operation.[311] These sources require different responses, including appropriate institutional access to system documentation, technical evaluation, and user training. The information needed also depends on the task: identifying the sources supporting an output may enable verification even where the model's internal operation remains difficult to explain.

When applied to judicial proceedings and the issuance of rulings, the ability to explain and justify judicial decisions based on AI tools or recommendations presents a real challenge. In reality, whether AI tools function as an independent instrument for issuing judicial decisions or as an aid to judges, providing recommendations for the judge to consider, they offer an explanation or justification for the decision made. However, this explanation does not necessarily reflect the true reason why the algorithm produced that outcome. The system may provide an explanation that appears convincing to humans but does not actually reflect the internal reasoning process of the system.[312] It may simply be a linguistic output based on statistical patterns, rather than a genuine legal understanding as a judge would provide.[313]

A generated explanation may be difficult to assess even with technical expertise. Commercial restrictions may create a further barrier by limiting access to information needed for independent scrutiny.[314] As noted by the Judicial Commission of New South Wales, "it is very difficult to challenge a computer's decisions, because whoever owns the algorithms owns the trade secrets associated with them, and is neither going to reveal the source code, nor likely be willing to even discuss the secret source and how it makes the algorithm function. What justifies the algorithm from an economic viability perspective is its success or perceived success, which is an entirely different question from whether or not it operates in biased ways."[315]

[310] Hendrickx 2025, p. 3.
[311] JUSTICE 2025, p. 34; Hogan-Doran 2021, p. 1136.
[312] Re and Solow-Niederman 2019, p. 261.
[313] Artigot i Golobardes, Grasso, Iamiceli and Maugeri 2024, p. 77.
[314] Artigot i Golobardes, Grasso, Iamiceli and Maugeri 2024, p. 77.
[315] Gravett 2020, p. 15.

All of this impacts the principle of transparency discussed above, affecting the parties' and the public's right to understand and trace judicial decision-making, comprehend its reasoning and rationale, exercise the right to appeal, and strengthen judicial oversight, among other serious consequences.[316]

The impact of AI's opacity in judicial processes varies depending on the role of these tools and the degree of their involvement in decision-making. This variation is key to the successful integration of AI in judicial processes. AI tools that exercise a high degree of independence in judicial decision-making cannot be accepted without judicial review of their operation if they do not provide a high level of transparency and the ability to justify their decisions. In contrast, AI tools used for legal research may provide valuable judicial support where their outputs are verifiable and judges retain control over their interpretation and use.[317] Nevertheless, some AI tools, even if they assist judges and do not operate independently, must provide a high degree of transparency. This ensures that judges can explain their decisions based on these tools' recommendations. An example of this is risk assessment tools that provide guidance on bail or pretrial detention decisions.[318] Therefore, transparency is one of the requirements highlighted by the EU's High-Level Expert Group on AI in their Ethics Guidelines for Trustworthy AI.[319] Overall, some scholars have linked the success of integrating AI tools in the judicial process to their ability to provide transparency and to offer explanations for the outcomes they produce.[320]

6.1.1.3 Algorithmic Bias and Discrimination

Equality and non-discrimination are fundamental requirements of judicial decision-making. Article 6 of the Jordanian Constitution establishes equality before the law, while judges are expected to decide disputes impartially and without discrimination. Human decision-making is not itself free from bias, and some scholars have therefore suggested that AI may offer greater consistency or objectivity in certain contexts. Xu, for example, argues that "Compared with human judges, judicial AI is more neutral and objective."[321] However, the use of AI does not eliminate the problem of bias. AI systems may themselves produce discriminatory or

[316] Hendrickx 2025, p. 7.
[317] Artigot i Golobardes, Grasso, Iamiceli and Maugeri 2024, p. 77.
[318] Grimm, Coglianese and Grossman 2024, p. 70.
[319] European Commission High-Level Expert Group on AI 2019, p. 18.
[320] Yamada 2023, p. 172.
[321] Xu 2022, p. 1030.

systematically distorted outcomes capable of affecting judicial fairness and fair-trial guarantees.[322]

Algorithmic bias may arise through at least two closely related pathways. First, bias may result from choices made during system design and development, including the selection of variables, weighting of factors, classification methods, model objectives, and other decisions that influence how the system processes information.[323] Such effects do not necessarily involve an intention to discriminate, although deliberate influence over system design cannot be excluded in particular circumstances.[324] More fundamentally, system designers must decide what objectives the system is intended to reproduce or optimise,[325] raising the question expressed by one commentator: "Should it reproduce the world as it is with maximum accuracy based on collected data, or should it be a tool to correct the world's imperfections by taking decisions that have been somehow 'enhanced'?"[326]

Second, bias may be inherited from historical data used to train or operate AI systems.[327] Where judicial, police, administrative, or other datasets reflect previous patterns of unequal or discriminatory treatment, a data-driven system may learn and reproduce those patterns even without any deliberate intention on the part of its developers. In this sense, algorithmic bias may represent the technological reproduction or amplification of existing human and societal biases.[328]

In the judicial context, bias does not only appear in predictive tools, risk assessment tools, or sentencing and bail recommendation tools, but also in tools like legal research systems that may prioritize certain results over others. The most famous real-life example of discriminatory risks in AI tools comes from the statistical study of the COMPAS program used in several U.S. courts. It revealed that the tool disproportionately classified Black defendants as higher risk compared to white defendants, due to historical biases embedded in the judicial and police data on which the system operated.[329] This prompted Sandra G. Mayson to observe: *"Algorithmic methods have revealed the racial inequality that inheres in all forms of risk assessment, actuarial and subjective alike. Neither colorblindness, nor algorithmic affirmative action, nor*

[322] Pietropaoli 2023, p. 11.
[323] Rejmaniak 2021, p. 28.
[324] Xu 2022, p. 1035.
[325] Rejmaniak 2021, p. 32.
[326] Rejmaniak 2021, p. 32.
[327] Rejmaniak 2021, p. 32.
[328] Rejmaniak 2021, p. 29.
[329] Xu 2022, p. 1035.

outright rejection of actuarial methods will solve the underlying problem. As long as crime and arrest rates are unequal across racial lines, any method of assessing crime or arrest risk will produce racial disparity."[330]

Some scholars also noted a critical distinction between human bias and algorithmic bias: humans have the ability to reflect and self-correct, while AI systems lack this capacity, which can lead to the persistence and recycling of biases in their operation.[331] Overall, it appears that humans are responsible for most instances of bias—both intentional and unintentional—because they are the ones who design, train, and select the data and features of these systems.

6.1.1.4 Individualised Justice and the Risk of Standardisation

Justice delivered by human judges is distinguished by being justice customized for each case. When the judge issues a ruling, he is not merely executing the legal text; otherwise, the function of the judiciary would be simpler than it is in reality. There is a state of direct interaction between the judge and the elements of the case, the texts of the law, the principles of justice, judicial precedents, the evidence, and the arguments of the parties, among others, all contribute to the formation of a personal conviction in the judge regarding the truth of the matter and what is required in the ruling. This conviction differs from one judge to another and from one case to another. Even before the same judge, the subjects of the cases may be similar, yet their rulings differ according to their circumstances, details, and particularities. This appears more clearly in criminal cases, in which the judge enjoys greater freedom in forming his personal conviction, in managing the evidence, in the authority granted to him to issue the ruling, in individualizing the punishment, and in other related matters. Andrea Roth described that by saying, "no dispute that the law as written does not perfectly capture 'justice.' Thus, equitable discretion is not understood by moral philosophers as a flouting of the law, but as a necessary part of making it whole".[332] Judicial discretion nevertheless carries risks of bias and unjustified inconsistency. The assessment of AI-assisted adjudication should therefore take account of both the strengths and limitations of actual judicial practice.

Against this background, an important question arises: Does predictive justice provided by AI tools constitute a challenge in producing customized justice? And will its application lead to the emergence of codified justice, where the priority is unifying results at the expense of

[330] Mayson 2019, p. 2296.
[331] Xu 2022, p. 1035; see also Rejmaniak 2021, p. 30.
[332] Roth 2016, p. 1285.

considering the special circumstances of each case?[333] And the more important question: is customized justice still desirable at all? In reality, it seems that the strategies and declared goals of some states aim at achieving the unification of judicial interpretations through the introduction of AI tools that achieve such an end. This is what was previously referred to in Chinese courts, where the authorities there wish to monitor judicial rulings with the aim of unifying interpretations.[334] Even within the judiciary itself, some have pointed out that there is a disparity between courts of first instance and appellate courts in this regard, as appellate courts appear more willing to move away from the literal application of legal texts and more inclined to adopt a broader interpretation that takes into account the principles of justice[335]. Also, it can also be considered that AI is capable of replacing human judges if what is intended is the issuance of judgments in which ethical considerations have no effect.[336] Yet, the growth of codified justice may not be the intended aim of states, but it may be the inevitable result of using AI tools that work according to algorithmic logic, which depends on patterns, correlations, and algorithmic rules, and does not capture the ethical and social dimensions and the special circumstances that human judges interact with.[337] This, in the end, will lead to an excess of uniformity in rulings and to rulings that do not harmonize with the special circumstances of cases, even if the unification of rulings has the advantage of eliminating human bias and arbitrariness. Also, the methodology of algorithms, which relies on previous historical judicial and legal data, may reinforce the biases or errors carried by this data without giving human judges the opportunity to engage and confront these earlier rulings with new ones that are fairer or more suitable. Human judges benefit from their life experiences, their interaction with society, and their ability to assess emotions, intentions, and the social impact of the case. AI lacks this dimension, for it does not live in society nor does it experience the effects of the decision on human beings.[338] Therefore, any social or ethical evaluation will be an imitation of previous patterns, not a real understanding.

[333] Re and Solow-Niederman use the idea of "codified justice" to describe the routine application of standardised procedures to recurring factual situations, in a manner that can resemble a non-digital legal algorithm. See Re and Solow-Niederman 2019, p. 253.
[334] The Supreme People's Court of China has linked the development of artificial intelligence to the objective of promoting greater consistency in sentencing, including the principle of "same case, same sentence," which is reflected in the Sentencing Guidelines on Frequent Crimes as a means of structuring and constraining judicial discretion. See Shi 2022, pp. 125–131.
[335] Yawar and Sadat 2025, p. 408.
[336] Yawar and Sadat 2025, p. 407.
[337] Re and Solow-Niederman 2019, pp. 287–289.
[338] Roth 2016, pp. 1285–1289.

Some have also pointed out that the legal opinion on which the human ruling relies is always subject to development and improvement through legal critique that interacts with all the components and elements of the ruling in a way that may not be available when attempting to critique the legal opinion generated by AI tools.[339] Likewise, the rigidity of justice resulting from algorithmic justice is undesirable compared to the evolution in the work of judges, their professional mobility, and their differences, where there is a state of continuous change across generations, compared with the stability and rigidity of justice produced by AI tools despite major events and changes.[340]

This leads to the conclusion that updating the legal system and thought will be slower when AI takes charge of issuing rulings. The best evidence for this is what we see in the change of judicial approaches and interpretations in issues that had long been marked by stability, until a new legal opinion proved more suitable, or new circumstances arose that made the application of the previous interpretation inappropriate. In all this, the human ruling is capable of evolution and better reflecting reality compared to justice resulting from algorithms that work on past data. This is why some have warned that the absence of an updating mechanism reflecting changes in these tools will lead to negative rigidity in the legal system.

More profoundly, insisting on granting AI tools the authority to issue rulings may, over time, create increasing pressure to amend laws to make them more suitable for application by these tools, and to make all their pillars and elements measurable and distinguishable through these tools at the expense of social, emotional, and psychological elements that are difficult for these tools to recognize.[341]

In addition, the application of codified justice generated by AI tools will highlight the flaws of human justice that may arise from human biases or mistakes, in a way that undermines other positive aspects of human judicial rulings. This may even be done deliberately by profit-driven

[339] Re and Solow-Niederman 2019, pp. 268–269.
[340] Re and Solow-Niederman 2019, p. 269.
[341] Re and Solow-Niederman 2019, pp. 253–254, 272. A comparable, although entirely non-AI-driven, tendency can be observed in Jordanian legislation, where certain statutes expressly restrict judicial discretion in sentencing. For example, the Traffic Law prevents courts from using discretionary mitigating reasons to reduce penalties below the statutory minimum; the Standards and Metrology Law likewise prohibit reliance on discretionary mitigating reasons; and the Economic Crimes Law prevents such reasons from reducing penalties below the statutory minimum for specified economic crimes. See The Hashemite Kingdom of Jordan 2008, Traffic Law No. 49 of 2008, as amended, art. 42(c); The Hashemite Kingdom of Jordan 2000, Standards and Metrology Law No. 22 of 2000, as amended, art. 34(c); The Hashemite Kingdom of Jordan 1993, Economic Crimes Law No. 11 of 1993, as amended, art. 4(c).

companies producing these tools, which could reflect in undermining trust in the legitimacy of the judicial system.[342] For example, any ruling issued by a human judge might come to be viewed as flawed by one of the deficiencies highlighted through codified algorithmic justice. This could influence the legislative authority's position in granting judges discretionary powers in criminal matters, for instance.[343] Furthermore, the growth of AI as a judge and source of rulings has negative repercussions on judges' view of themselves, reducing their status and authority, making them a support team for these tools rather than the reverse.[344] This psychological effect will reflect on the courage of judges, making them more inclined to apply equitable discretion less often compared to their reliance on codified legal rules and standardized criteria.[345]

What must be noted, however, is that this issue is not limited to predictive justice tools but extends to tools of legal reasoning and justification, legal interpretation, and risk assessment in bail decisions and others, since all these tools involve a part of the process of issuing judicial decisions and rulings.[346]

Moreover, the litigation process cannot be reduced merely to the issuance of a judicial ruling; rather, it represents a sequence of procedures that are primarily intended to achieve a fair and just decision. These procedures also aim to satisfy the litigants' sense of justice through the confrontation of claims and evidence and by allowing them to express their statements, complaints, and allegations. This is what Kevin S. Burke and Steven Leben expressed, stating:

Social science research shows that when judges apply procedural fairness (procedural justice) principles while handling cases, litigant satisfaction with the court system and willingness to comply with court orders increases. These principles call for judges to be sure people in court have a chance to be heard, are dealt with by a neutral but empathetic judge, and have a good explanation of both procedures and outcome".[347]

The parties do not simply seek ready-made judicial decisions rendered at the push of a button—even if such judgments are legally sound. Instead, they need to fulfil their innate sense of justice by having their grievances heard and their evidence thoroughly examined. Therefore,

[342] Re and Solow-Niederman 2019, p. 273.
[343] Re and Solow-Niederman 2019, p. 273.
[344] Re and Solow-Niederman 2019, p. 274.
[345] Re and Solow-Niederman 2019, p. 274.
[346] For more details about the effect on risk assessment tools, see: Mayson 2019, pp. 2218-2300.
[347] Burke and Leben 2020, p. 685.

the use of AI tools may abbreviate some of the procedural steps that satisfy this intrinsic sense of justice among the parties, leading litigants to feel that their voices and concerns have not been adequately heard. Yutaka Matsuo, a Japanese scholar, expressed a similar view in the context of seeking legal advice, noting that "I suspect that many people would prefer to have a face-to-face conversation with a lawyer, which may be more acceptable to the client, rather than having a machine tell you, 'There is a 15% chance that your claim will be accepted by the court.'"[348]

6.1.2 Operational Risks of AI in Judicial Decision-Making

This section addresses risks arising from the performance and functional limitations of AI systems in judicial contexts.

6.1.2.1 Overreliance on AI

Some risks associated with the use of AI may not stem from defects in AI tools themselves but rather from the way they are used and relied upon. Nevertheless, due to the seriousness of some of these issues, they are discussed as one of the risks of using AI in the judiciary. Overreliance on AI is one of the real dangers that may result from integrating AI tools in the judiciary, and it also has implications for questions of accountability and the allocation of responsibility arising from the use of such tools.[349] This risk is reinforced when one of the reasons for introducing these tools into the judicial sphere is to address the heavy burden placed on judges in resolving disputes.[350] One of the main objectives of using such tools is to ease this judicial workload, allowing judges more time and energy to focus on complex legal issues, with the ultimate goal of improving the overall quality of the judicial process. Achieving this aim, however, presupposes the optimal use of these tools by judges. Optimal use varies depending on the methodology and strategy adopted by each state in integrating these tools into the judges' work environment.

If we speak of AI tools designed to assist judges, the main role in decision-making still rests with the judges themselves. This naturally requires judges to supervise all stages of decision-making, ensuring the accuracy and soundness of the procedures followed. For example, if a judge uses an AI tool to summarize or draft part of a judgment, they must verify the correctness of what the tool has generated. On another note, if some AI tools

[348] Matsuo 2016, quoted in Xu 2022, p. 1036.
[349] Carnat 2024, pp. 1, 4.
[350] Xu 2022, p. 1040.

have not been formally introduced into the judicial process, or have not been customized, tested, and verified for reliability and safety, then a judge's reliance on them poses a significant risk.

Judges may become overly reliant on AI outputs for several reasons, including workload pressure, repeated exposure to apparently reliable recommendations, or an incomplete understanding of how the underlying systems operate. The literature on automated decision-making has identified a tendency towards automation bias, whereby human users may give excessive weight to automated recommendations or fail to scrutinise them sufficiently.[351] The likelihood of overreliance varies with system design, task demands, and the conditions available for verification. This risk may be reinforced where users misunderstand the inferential nature of AI systems. Many systems identify correlations and statistical relationships within data, but the existence of such relationships does not necessarily establish causation or provide a complete explanation of the underlying legal or factual situation.[352]

In all cases, overreliance on these systems may increase errors in judicial decisions, diminish the reasoning and justification of judgments, and negatively affect transparency in the judicial process, as previously noted.[353] Ultimately, this has negative repercussions on the integration of AI tools in the judiciary. Errors resulting from overreliance will not only harm the authority of the decision-maker but also damage the reputation of the AI systems themselves, with the error attributed to them. This could lead higher courts to suspend or restrict their use, or provoke public backlash against their adoption, thereby obstructing the integration process as a whole.

6.1.2.2 Inaccuracy and Reliability of AI Outputs

Some may believe that the results generated by AI systems are always highly accurate and reliable, and some may even describe them as model outcomes that should serve as a benchmark for other results. In reality, however, the accuracy and reliability of AI outputs are not always guaranteed. The inaccuracy of AI results is due to several diverse reasons that differ in their nature and origin.

[351] Rocha and Carvalho 2022, p. 5.
[352] Rejmaniak 2021, p. 30.
[353] Hendrickx 2025, p. 7.

The first source of inaccuracy is hallucination. Hallucination refers to AI producing outputs or information that are incorrect or entirely fabricated.[354] In the judicial environment, this may take the form of attributing a court decision that does not exist, referring to a legal text that is not actually there, or linking a specific dispute to the wrong case number or different names. The danger arises where a system provides an unsupported answer rather than indicating uncertainty or declining to respond, particularly when correct and incorrect information are combined in a convincing output. Hallucination is often experienced in LLMs, and some have described it as inevitable.[355] Herrera-Tapias and Hernández Guzmán explained hallucination in LLMs by saying:

"LLMs produce text by reusing, reshaping, and recombining training data to produce new responses without considering the output's reliability or authenticity. Consequently, recombining this data to produce responses in different contexts can result in inaccurate information. As a result, various hallucination factors generate hallucinated output that appears to be highly relevant to the prompts, but it is fabricated."[356]

Hallucination can arise in several ways. One type is when the system generates responses that are inconsistent with the inputs - known as narrow-domain hallucination - common in tools for machine translation, summarisation, or information extraction.[357] Another type arises when the system produces outputs that contradict its training set, known as external or open-domain hallucination, as seen in legal research tools.[358] Finally, hallucination may occur when the system generates outputs that lack fidelity to real-world facts, regardless of its training data. This type of open-domain hallucination produces unrealistic results and is considered one of the most concerning forms, as it can undermine the required accuracy in any legal context.[359]

AI hallucinations have created concrete risks for the integrity of legal practice. In several cases, lawyers have relied on fictitious authorities generated by AI tools, resulting in judicial criticism and, in some instances, sanctions in the United States.[360] Courts in the United States have encountered cases in which lawyers relied on non-existent judicial decisions, quotations, and citations generated by AI systems, some of which were falsely attributed to real judges. In

[354] Magesh et al. 2025, p. 216.
[355] Xu, Jain and Kankanhalli 2024.
[356] Herrera-Tapias and Hernández Guzmán 2025, p. 1187.
[357] Dahl, Magesh, Suzgun and Ho 2024, pp. 67–68.
[358] Dahl, Magesh, Suzgun and Ho 2024, pp. 67–68.
[359] Dahl, Magesh, Suzgun and Ho 2024, pp. 67–68.
[360] Mata v Avianca, Inc., 678 F. Supp. 3d 443, 448, 466 (S.D.N.Y. 2023); see also World Lawyers Forum Editorial Team 2025.

several of these cases, the courts emphasised that the principal concern was not the use of AI itself, but the failure of lawyers to discharge their professional responsibility to verify the accuracy and authenticity of the authorities and information submitted to the court.[361] In one systematic study of four public-facing LLMs, when the models were asked direct, verifiable questions about randomly selected U.S. federal court cases, hallucination rates ranged from 58% for GPT-4 to 88% for Llama 2.[362] The study also found that the models struggled to assess their own certainty and identify when their responses were unreliable.[363]

Although some technical developments have been described as reducing hallucination in AI systems, these methods remain limited and depend on complex factors such as data quality, retrieval mechanisms, and the persistence of contradictions or biases that are hard to eliminate.[364] An applied study on several AI systems confirmed that claims by some companies about eliminating hallucination in their tools are overstated.[365] The possibility of residual hallucination requires task-specific evaluation, traceable sources, and effective verification before outputs are relied upon in judicial work. Overall, there is a need for joint collaboration between developers, courts, and legal professionals. Developers should prioritize the quality and diversity of legal data, ensure transparency, and provide real-time verified citations. Courts should require disclosure of AI use and adopt governance rules that encourage human verification. Finally, training legal professionals in AI literacy and adopting professional codes of ethics across the sector are key to ensuring responsible and trustworthy use.[366]

In addition to hallucination, inaccuracies in AI systems may also arise from deficiencies in the data on which they rely. Where the underlying data are incomplete or inaccurate, the reliability of the system's outputs may be affected.[367] In the judicial field, this could result from failing to incorporate updates to laws and judicial precedents in a timely manner, leading to delays in updating the datasets feeding these systems. It could also stem from a lack of sufficient case law addressing a particular legal issue, leaving the system to rely on only a few cases, which may not produce reliable results. Within this framework, some AI tools intended for predicting judgments or assisting judges in assessing risks, among other functions, may face increasing shortcomings in dealing with modern disputes where previous data does not sufficiently allow

[361] Mata v Avianca, Inc., 678 F. Supp. 3d 443, 448–449 (S.D.N.Y. 2023); Matter of Samuel, 82 Misc. 3d 616, 620 (Sur. Ct. Kings County 2024); see also Mason Hayes & Curran 2025.
[362] Dahl, Magesh, Suzgun and Ho 2024, p. 66.
[363] Dahl, Magesh, Suzgun and Ho 2024, p. 66.
[364] Dahl, Magesh, Suzgun and Ho 2024, p. 88.
[365] Magesh et al. 2025, p. 216.
[366] Chakravarty 2025.
[367] Chen and Li 2020, p. 4.

for their matching or comparison. The emergence of such difficulties does not necessarily require the subject matter of the cases to be entirely new; rather, it is sufficient that one of the factors or elements influencing the case is new and distinct from what has previously existed. In such situations, the weakness of the AI tool—which relies on past data—becomes evident in addressing new phenomena, and time is required to incorporate these new factors into the database that feeds it.[368]

Another major issue is AI's limited ability to interpret judicial decisions accurately and to distinguish their holdings, legal actors, and place within the hierarchy of precedent.[369] This is common in legal disputes, as each case has its own circumstances and context that strongly affect the outcome. If these contexts are unreadable by AI, the quality of its outputs will inevitably suffer. As Ryan McCarl noted: *"Legal reasoning frequently involves interpreting texts. Computers can easily identify statistical relationships among words and phrases, but they cannot read or understand text in a way that approximates what lawyers do when they read a judicial opinion."*[370] Moreover, the language used by judges in their rulings varies greatly, making it harder for AI to recognize whether terms carry the same or different meanings. One judge may consistently use certain terms with specific connotations in their reasoning, while another judge might use different terms to convey the same meaning in the same context. AI systems struggle to identify this unity or divergence, particularly when legal, judicial, or even colloquial terms are involved. Shi has pointed to this issue with regard to the Chinese language, which, according to his description, enjoys high flexibility and contains a wide variety of legal terms that differ in their structures yet carry the same meaning. It is unlikely that AI would understand that these variations or structures refer to the same concept.[371] This is a matter that makes it difficult for the programmers of these systems to teach AI in advance what these variations are, because they cannot predict the usage that will be adopted by judges in every ruling.[372] And if this is the case in the Chinese language, the Arabic language used in Jordanian courts is also rich and fertile with different terms that convey the same meaning. Moreover, the same term may differ in meaning depending on the context in which it is used. An example of this is what arises from the judges' use of the terms "invalidation of the contract," "rescission

[368] Shi 2022, p. 125.
[369] Magesh et al. 2025, p. 226; see also Estreicher and Polani 2025.
[370] McCarl 2022, p. 939.
[371] Shi 2022, p. 131.
[372] Shi 2022, p. 131.

of the contract," and "termination of the contract" in different contexts, sometimes serving the same meaning and at other times a different one.

6.2 Interview Findings on AI-Related Judicial Risks

The interviews identified several overlapping risk themes concerning the use of AI in judicial decision-making. Table 3 summarises the main themes identified by the judges.

Table 3 Jordanian Judges' Anticipated AI Risk Themes in a Pre-Deployment Context

Risk theme	Participants
Overreliance on AI	17
Data confidentiality and misuse	9
Inaccuracy and unreliability of AI outputs	8
Risks to the human and individualised nature of adjudication	5
Transparency and explainability concerns	4
Algorithmic bias and discrimination	1

Note: Participants could identify more than one risk; the categories are therefore not mutually exclusive. Frequencies indicate the number of participants who mentioned each theme and should not be interpreted as statistical estimates beyond the interviewed judges.

Source: Author's analysis of interviews with 18 Jordanian judges.

Among all the risks raised, overreliance on AI tools emerged as the most frequently identified risk among participants, as most participating judges expressed concern that excessive reliance on these tools may negatively affect the quality of the judicial decision. (P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P13, P14, P15, P16, P17). Some judges stressed that the fact that the judge remains responsible for their decision—even with the use of AI tools—does not negate the risk of overreliance, because the risk remains present despite responsibility. (P1)

In elaborating on this risk, a number of judges focused on how overreliance weakens motivation for research and thinking, in a way that may affect the judge's cognitive capacities in the long term. (P2, P7, P10, P13). As one judge said: "After years of use—say, after five or ten years—it may affect knowledge itself, and the judge's abilities and personality; because he will start relying on AI for many things, so his reading decreases, his deep thinking about the

case before him decreases, and he relies more on the tool. I see that this may greatly affect the judge's personal capacities in the long run." (P13). In the same context, another judge warned that the pressure and sheer volume of cases may gradually push toward turning the tool from an assisting means into a practical substitute for the judge's role, saying: "Because of the enormous number of lawsuits, the judge may find 'comfort' in relying on AI tools, and over time he starts relying little by little on their outputs, so their role shifts from a tool that helps the judge to something like an 'automated judge'—if the expression is correct—and this is what we warn against; we fear that excessive reliance will lead to weakening the role of the human judge." (P 9)

Moving from describing the risk to proposing ways to limit it, some judges pointed to the need to establish controls and oversight exercised by the Judicial Inspection body to curb overreliance. (P3, P5, P6). However, this approach was not presented as sufficient by itself; some judges stressed that oversight should not be merely formal, but rather substantive and precise. (Participant No. 4). From a more specific angle regarding the scope of use, one judge proposed that confronting the risk of reliance requires restricting the use of AI tools to specific tasks that are distant from drafting the judicial decision. (P16)

Alongside the internal effect on the judge and the quality of their decision, concerns were also connected to the image of the judiciary before society. Some judges stated that the use of AI may reduce public trust in the judiciary, as it may generate convictions that AI is the one issuing decisions. (P4, P12, P14). This suggests that the risk is not limited to the technical performance of judicial work but extends to social legitimacy and public trust.

Another notable result is that some judges linked the integration of AI tools—especially when conceived as a means of dispute resolution—to a potential impact on opportunities for reconciliation and amicable settlement, which judges currently succeed in achieving in a not insignificant number of cases. (P12). In explaining this human and social dimension, the judge said: "Cases are not merely numbers; many of them are reconciliation cases, health cases, and family cases, resolved through reconciliation and dialogue. If we turn them all into an electronic application, society will become harsher, and this is not socially healthy." (P12)

When discussing judicial independence, concerns emerged regarding the possibility of external influence on judges or the exploitation of data. Some judges showed awareness of the possibility that AI technologies might be used to influence judges' orientations, or to use the data judges' input for purposes unrelated to justice. (P7, P12, P13). One judge expressed this

by saying: "Certain entities may resort to AI programs to influence judges' opinions on certain legal issues, or to use the data that judges input for their own commercial or profit-making purposes." (P7). Another judge elaborated on risks related to cybersecurity, politicization, and manipulation, saying: "The system can be exposed to hacking, stoppage, politicization, or directing it against the interest of the state or against justice. These are newly emerging systems, and they can be targeted for hacking or manipulation; for this reason, introducing them must be very carefully studied." (P12)

In contrast to this cautious view, some judges expressed that there is no potential impact between the use of these systems and the principle of judicial independence. (P2, P17). One judge also presented an opposing view, suggesting that AI may enhance judicial independence; because the judge, without the support provided by AI systems, may be influenced by public opinion or by the view of a colleague or superior, whereas AI is more neutral in this regard. (P13). Nevertheless, confidentiality and data protection remained strongly present among a number of participants. Several judges stated that one of the most prominent risks related to independence is the danger of accessing the confidentiality of judicial decisions before they are officially issued or using litigants' data. (P3, P4, P7, P8, P9, P10, P16). In this context it was stated: "No one knows how AI algorithms work, and whether the research that you yourself will conduct or the data stored through AI programs will appear when another person conducts a search or not. This constitutes a major challenge to their use." (P4).

Recurring concerns also included issues of bias, error, and inaccuracy. Some judges considered that bias in AI outputs represents a form of error in the result, with one of them saying: "The biggest concern, I think, is that the data it is working on are inaccurate, or data that may be seen as biased, and therefore it issues a biased decision... meaning bias as one of the paths of error, and therefore it is error." (P14). This also branched into concern about the inability to predict outcomes or control them. (P5, P6). One judge even pointed to the possibility that systems could be programmed to serve certain interests. (P 6).

Within the same framework, a number of judges emphasized that error and inaccuracy in AI outputs are among the most prominent dilemmas, because of the direct impact this may have on litigants' rights. (P2, P8, P9, P11, P15, P16, P17). One judge clearly expressed the seriousness of this by saying: "We deal with people's rights, financial rights, personal rights, and even freedoms. If we said that AI is 'guaranteed and does not err,' then we could say there are no concerns; but concerns appear if there is an error rate, because any error in AI may waste people's rights." (P2). In a more balanced framing between benefit and caution, one participant

said: "It is not possible to rely on AI outputs as 'legal givens,' especially in judicial work. But, in my view, AI tools broaden the judge's understanding, give him the main markers needed to verify the correctness of results, and expand his horizons in the scope of legal research in general." (P9). Another judge warned about the instability of results and the possibility of contradiction, saying: "These results may actually contradict another AI program, or contradict the same program if you use it at another time." (P11). One judge attributed inaccuracy to the lack of correctness and precision in the data that feed these systems. (P18)

These concerns intersected with another dimension of great importance in the judicial context: transparency and the ability to interpret outputs and justify them. Some judges expressed uncertainty as to whether they would be able to trace the steps through which AI systems reach results. (P8, P11, P14). In highlighting the difference between the judge's logic and the system's logic, one judge said: "The judge, if he wants to exclude one testimony and rely on another to build his judgment, can justify and explain that. But AI, I do not know—in terms of conception—how it could decide to exclude a certain testimony and not rely on it and consider another as the more likely to build the decision upon." (P13). Another judge warned that the absence of the ability to interpret and justify results affects the exercise of review over judicial decisions by higher courts and the convincing of parties of the correctness of the judicial decision, in a way that enhances trust in the judiciary. (P14)

From a different angle, some judges discussed the limits of AI in grasping the human considerations that may affect the judicial decision, especially in certain criminal decisions that involve broad discretion and human considerations, unlike civil cases that are governed more by evidence. (P1, P4, P11, P15). In this sense, one judge describes other elements besides the legal element in decision-making by saying: "Sometimes we introduce a legal perspective, in addition to a personal perspective, and a human or social perspective, in the process of making the decision." (P15)

Despite judges expressing multiple views about risks, limited knowledge of how AI works appeared as an important given, as many judges stated that they do not know the mechanism of AI. From here came a general conviction that awareness must be built before actual integration. Most judges agreed that Jordanian judges need intensive and in-depth awareness courses on the use of AI tools before integrating them into the judicial environment. Some also pointed to a large gap between judges' understanding of AI and its real risks. (P7). In a practical aspect related to efficiency of use, one judge indicated that dealing with AI tools should be

done skilfully, because the question directed to these systems must be well formulated; otherwise, the results will come distorted. (P8).

6.3 Comparison and Interpretation of Risks Identified in the Literature and Judicial Perceptions in Jordan

The interviews show that judges perceived AI-related risks mainly through their anticipated effects on judicial work. At a deeper analytical level, the findings reveal a gap between judicial perceptions in a pre-deployment context and the risk categories identified in the literature. While the literature identifies a broad range of operational and structural risks, the interviewed judges did not articulate these risks with the same level of abstraction. They were more likely to emphasise risks close to their daily professional experience, particularly overreliance, inaccuracy, and the possible weakening of legal reasoning. Confidentiality and data misuse, however, also emerged as a notable institutional concern with implications for judicial independence. This difference may reflect variation in how risks are understood and articulated, although the findings do not exclude substantive differences in participants' views.

This pattern may be interpreted in light of the pre-deployment character of the Jordanian judicial context. The distinction between operational and structural risks was introduced in the literature review as a descriptive way of organizing the existing scholarship, but the interview findings allow this distinction to be developed further as an interpretive framework. Since AI systems have not yet been formally integrated into judicial decision-making, judges are more likely to assess AI through anticipated effects on familiar judicial tasks, such as legal research, drafting, verification of legal information, and the preparation of judgments. By contrast, structural risks tend to remain less visible because they usually become clearer when AI systems are embedded within institutional procedures, data infrastructures, and governance arrangements. The pattern may also reflect the framing of interview questions, differences in professional vocabulary, or reluctance to discuss sensitive institutional matters. The study's design does not establish the relative contribution of these factors, so the pre-deployment context remains a possible explanation rather than a demonstrated cause.

The relevance of this pre-deployment perspective can also be understood through anticipatory governance and technology assessment approaches, which emphasise the importance of examining potential risks before emerging technologies become embedded in institutional

practice.[373] This is particularly important in the judicial field, where technological errors may affect individual rights, procedural fairness, and public confidence in the administration of justice. Studying judicial perceptions before the formal use of AI is therefore not merely a methodological limitation, but an opportunity to identify which aspects of judicial work judges consider most vulnerable to technological change.

The findings should therefore be read as anticipatory perceptions rather than as evidence of how judges would respond after direct interaction with deployed AI systems. This distinction matters because expectations concerning emerging technologies are not static but may evolve over time as actors acquire greater proximity to, and knowledge of, the technology in practice.[374]

Within this context, overreliance on AI emerged as the most frequently reported concern, being raised by seventeen participants. Judges linked this risk directly to daily adjudicative practice, particularly the possibility that AI tools may reduce independent legal research, weaken careful engagement with legal materials, and affect the depth of judicial reasoning. This concern reflects more than a general fear of technological dependency. It indicates that judges understand the quality of adjudication as closely connected to the judge's active intellectual involvement in the reasoning process. From this perspective, excessive reliance on AI may threaten not only the correctness of legal outcomes, but also the internal quality of judicial decision-making itself.

This finding can be analysed in light of the literature on automation bias. Automation bias describes a tendency towards inappropriate decision-making arising from overreliance on automated systems, particularly where high workload may reduce the user's ability to monitor automated outputs effectively.[375] These conditions are highly relevant to judicial work, where judges often operate under significant caseload pressure and must process large amounts of legal and factual material. In such an environment, AI-generated suggestions may become persuasive not because they are necessarily correct, but because they appear efficient, coherent, and authoritative. Accordingly, the risk of overreliance should not be understood simply as individual negligence by judges, but as a foreseeable interaction between technological design, institutional workload, and human cognitive limits.

[373] See Guston 2010, pp. 432–441; see also Grunwald 2009, pp. 1103–1146.
[374] Konrad, van Lente, Groves and Selin 2016, pp. 467, 471–472.
[375] Parasuraman and Riley 1997, pp. 240, 249.

Moreover, several judges connected overreliance with broader concerns about judicial authorship, professional responsibility, public confidence, and procedural justice. The legitimacy of judicial decision-making depends not only on the outcome, but also on maintaining public confidence that decisions are made by judges acting independently and impartially as arbiters of fact and law.[376] If AI tools are perceived as substantially shaping judicial decisions, this may blur the boundary between human judgment and machine-generated assistance. It may also weaken litigants' acceptance of judicial outcomes, since procedural justice theory suggests that public acceptance of legal decisions depends partly on whether the process leading to them is perceived as fair, human, and institutionally legitimate.[377] In this sense, overreliance may create not only a technical or cognitive risk, but also a normative risk affecting public confidence in the fairness and legitimacy of adjudication.

The reference made by one participant to reconciliation and settlement practices further supports this interpretation. Judicial work is not limited to producing formal legal outcomes. It also includes communicative, relational, and sometimes conciliatory functions, especially in legal cultures where the judge may play an important role in guiding parties toward settlement or narrowing the dispute. AI systems may assist with information processing, but they cannot easily reproduce the interpersonal judgment, contextual sensitivity, and communicative authority involved in such practices. This suggests that the risks of AI adoption may extend beyond legal reasoning narrowly understood and may also affect the social functions through which courts manage conflict and maintain public trust.

By contrast, structural risks emphasised in the literature were less clearly articulated by participants. Judicial independence was mentioned less frequently and was often understood in a narrow institutional sense, namely as long as the judge remains the final decision-maker. This suggests that many judges associated independence mainly with formal decision-making authority, rather than with technological conditions that may indirectly shape judicial reasoning. In a pre-deployment context, these dimensions remain only partially visible. This may help explain why participants were less likely to frame AI-related risks to judicial independence in broader structural terms, since the institutional and structural consequences of technology often become clearer through its situated and recurrent use in practice.[378] However, several participants raised concerns about the disclosure or misuse of judicial information and

[376] Geyh 2025, p. 1281.
[377] Tyler, Jackson and Bradford 2014, pp. 4016–4017.
[378] Orlikowski 2000, pp. 407, 423.

draft judgments. These concerns connect with the confidentiality dimension of judicial independence discussed in Section 6.1.1.1, particularly where access to unpublished judicial material could facilitate monitoring or pressure. Concerns about litigants' personal data also reflect the familiar judicial duty to protect confidential case information.

Transparency and explainability concerns were expressed in different ways. Some participants questioned how AI outputs could be traced and verified (P8, P11, P14). P13 connected explanation to the justification of evidentiary choices, while P14 also linked it to appellate review and convincing the parties of the correctness of the judgment. The technical uncertainty expressed in some accounts may be understood in light of the limited epistemic visibility of AI systems at the pre-deployment stage.[379]

Algorithmic bias was also rarely identified as a distinct structural risk. When participants referred to this issue, it was generally framed as a problem of inaccurate or unreliable outputs, rather than as a systemic risk arising from training data, model design, or institutional patterns embedded in datasets. This differs from the literature, where algorithmic bias is usually treated as one of the most significant risks of AI in legal decision-making. One possible interpretation of this difference concerns the limited epistemic accessibility of algorithmic bias before deployment. Bias in AI systems is often difficult to observe directly, especially without technical knowledge of how systems are trained, tested, and deployed. In a pre-deployment judicial context, judges are therefore more likely to notice the visible consequence of bias, namely an incorrect or unfair output, rather than the underlying structural source of that output.

Concerns about inaccuracy, by contrast, were more visible in the interviews. Several judges referred to the possibility that AI systems may produce inconsistent, incomplete, or unreliable results, including variation in outputs across systems or over time. These concerns align with broader debates on the reliability of large language models, but the judges expressed them in practical rather than technical terms. This is important because it shows that judges may recognise the consequences of technical limitations without necessarily using the terminology found in the literature. For them, the central issue is not the internal architecture of the model, but whether the output can be trusted, verified, and used responsibly in the preparation of judicial decisions.

[379] Humphreys 2009, pp. 618–619.

Finally, several participants emphasised the limits of AI in replicating judicial reasoning. They argued that adjudication requires contextual evaluation, interpretation of legal texts, assessment of evidence, and the exercise of human judgment. These elements cannot be reduced to computational processing or automated prediction. This finding is particularly important because it reflects a deeper understanding of adjudication as a normative and interpretive practice, not merely as an information-processing activity. AI may support judges in research, organisation, or drafting, but it cannot replace the responsibility of the judge to interpret the law, evaluate facts, and justify the decision. From the perspective of judicial professional identity, this distinction is central: judicial legitimacy depends on the judge's independent and reasoned engagement with the case, not merely on the production of a formally correct outcome.[380]

Beyond the distinction between operational and structural risks, the findings also show variation among judges themselves. Although participants came from different judicial environments and specialisations and were interviewed before formal institutional integration of AI, although some reported informal individual use, the findings did not reveal substantial differences in risk perception based on place of work or judicial specialisation. Nevertheless, judges did not perceive risks in exactly the same way. Many focused mainly on immediate practical effects, while a smaller number identified broader implications relating to data, cybersecurity, institutional control, and public trust. Limited indications suggest that judges in more specialised fields were sometimes able to anticipate a wider range of risks, possibly because such fields bring judges closer to technical or digitally mediated forms of judicial work. The suggested links with specialisation, technological familiarity, and cognitive engagement remain tentative interpretations that require further investigation. Overall, this variation appears to reflect differences in familiarity with digital tools, cognitive engagement with emerging technologies, and the ability to imagine how AI may operate within judicial structures.[381]

Overall, the findings suggest that judges' pre-deployment perceptions of AI may be influenced by the absence of direct institutional use, judicial professional identity, and differences in technological familiarity. Risks visible within ordinary judicial practice were more readily articulated, while risks requiring deeper technical or institutional exposure remained less developed. Data-related risks qualified this pattern, as they were visible through the familiar

[380] Dworkin 1986, pp. 225–227, 255, 412.
[381] Jenkins, Lachlan and Osman 2024, pp. 8–9.

judicial duty to protect judicial information and draft judgments. Accordingly, the gap may reflect differences in how risks are understood, named, and prioritised before institutional deployment, alongside possible effects of interview framing and professional context.

6.4 Chapter Conclusion

This chapter has shown that judicial perceptions of AI-related risks in Jordan were formed in a pre-deployment context. In the absence of direct institutional experience with AI systems, judges assessed these risks primarily through their relationship to judicial reasoning, professional responsibility, and the fairness of the adjudicative process. The findings therefore do not indicate a general rejection of AI, but rather a cautious assessment of its possible implications for the core functions and values of judicial decision-making.

Operational concerns were particularly prominent, especially overreliance on AI and the reliability of its outputs. At the same time, confidentiality and the possible misuse of judicial or case-related data emerged as important institutional concerns, while risks such as algorithmic bias, systemic opacity, and the longer-term transformation of adjudication were less prominently articulated. These differences are best understood as differences in emphasis rather than as a contradiction between judicial perceptions and the broader literature.

The findings demonstrate that AI-related judicial risks cannot be assessed in the abstract or uniformly across all applications. Their significance depends on the particular technology, the judicial task involved, the degree of system autonomy, and the level of meaningful human oversight. This provides the basis for the following chapter, which develops a normative framework for assessing whether the potential benefits of particular AI applications are sufficient to justify their associated risks and safeguards.

7. A Normative Framework for the Use-Specific Assessment and Classification of AI in Judicial Decision-Making

The assessment of AI in judicial decision-making should not begin merely from a desire to keep pace with technological development or from the assumption that introducing advanced tools into courts is valuable in itself. It should begin by identifying the judicial need and assessing the proposed tool's expected additional value alongside realistic institutional, human, procedural, and conventional digital alternatives. Reflecting this cautious and needs-based approach, the CEPEJ emphasizes that "It is also essential to carry out research on the proposed applications and test them, both to understand their potential and their weaknesses and to be able to develop them further and adapt them to our needs".[382]

The preceding chapters identified challenges relating to judicial workload, legal research, review of case files, judgment drafting, complex disputes, and expert evidence, and examined the benefits and limitations of existing reform measures. These findings provide a basis for considering whether particular AI applications could offer additional or comparatively more effective forms of support in relation to specific judicial tasks. They do not, however, establish that AI is necessarily preferable to existing human, institutional, procedural, or digital alternatives. This makes it necessary to move from a practical assessment of AI's potential utility to a normative assessment of whether its use can be justified.

The normative assessment must consider both the expected benefits and the possible effects of AI. A practical benefit does not automatically justify the use of AI, just as the existence of a risk does not necessarily require its complete rejection. This analysis is informed by the principles of necessity and proportionality and by international risk-based approaches to AI governance. UNESCO's Recommendation on the Ethics of AI provides that the use of AI systems should be appropriate and proportionate to a legitimate aim and that risk assessment should be used to prevent or mitigate potential harm.[383] Similarly, the European approach to AI regulation distinguishes between applications according to their level of risk and specifically treats certain AI systems used to assist judicial authorities in researching and interpreting facts and law, and in applying law to concrete facts, as high-risk systems.[384] These

[382] CEPEJ 2018, p. 60.
[383] UNESCO 2021, paras. 25–26; see also Gutiérrez 2025, pp. 18, 21–22.
[384] Regulation (EU) 2024/1689 (Artificial Intelligence Act), Annex III, point 8(a), and recital 61.

instruments are not applicable law in Jordan, but they provide useful comparative reference points for identifying functions that require heightened safeguards.

The central questions are therefore when the expected benefits of AI are sufficient to justify its use, which safeguards are necessary to control its risks, and when a less risky alternative should be preferred or the proposed use excluded. The analysis accordingly proceeds from the growing pressure towards judicial AI adoption to the criteria for balancing its benefits and risks, and then to the classification of its uses as acceptable in principle, conditional on additional safeguards, or excluded under the proposed framework.

7.1 The Need for Proactive and Selective Judicial AI Governance

The normative assessment of AI in judicial decision-making should begin by recognising the scale of the technological transformation currently taking place. AI should not be viewed merely as another digital tool capable of improving efficiency. Its significance also lies in its growing influence on how institutions process information, organise knowledge, and perform professional tasks.

Historically, some technologies have developed into general-purpose technologies that are widely used across different sectors and generate extensive economic and social effects. Electricity and information and communications technologies provide prominent examples.[385] Their importance did not arise from one particular application, but from their capacity to penetrate different sectors and reshape the organisation of social and institutional life. Andrew Ng's description of AI as "the new electricity" reflects a similar expectation:[386] AI may become important not because of a single dominant use, but because of its capacity to transform a wide range of activities simultaneously.

The expanding scope of AI use reinforces this comparison. AI applications increasingly extend across interconnected sectors, including transportation, energy, water, agriculture, climate-related systems, health, and digital infrastructure.[387] Richard Susskind's observation that AI has effectively become a verb "we can AI it" captures the growing assumption that many tasks can be redesigned around computational assistance.[388] AI therefore does not merely accelerate existing processes; it increasingly affects how those processes are structured, who performs

[385] Crafts 2021, pp. 521–522.
[386] Knowledge at Wharton Staff 2017.
[387] Ajayi et al. 2025, pp. 2–3.
[388] Susskind 2019, p. 263.

them, and what levels of speed, consistency, and productivity institutions are expected to achieve.[389]

The rapid expansion of AI investment and its growing integration into professional services indicate that judicial institutions are likely to face continuing pressure to consider AI-based tools. Market expansion does not, however, establish either judicial need or the appropriateness of adoption. The justification for judicial AI must instead depend on whether a defined use addresses an identified judicial problem under legally and institutionally acceptable conditions.

The scale of investment in AI also indicates that this is unlikely to remain a temporary technological trend. Global corporate AI investment reached approximately USD 581.7 billion in 2025, more than double the level recorded in the previous year.[390] AI companies also attracted USD 258.7 billion in venture-capital investment during 2025, representing 61 per cent of global venture-capital funding.[391] These investments create strong economic and institutional incentives for AI to become increasingly integrated into ordinary forms of work.

These developments do not establish that the introduction of AI into judicial decision-making is inevitable, nor do they provide a legal or ethical justification for every possible use. Technological expansion cannot determine its own legitimacy. Nevertheless, AI is not a form of technology that judicial institutions can realistically disregard indefinitely. Its growing accessibility, its integration into legal and professional services, and the scale of the resources directed towards its development are likely to create continuing pressure for its use within and around courts.

This pressure is particularly important because the judiciary does not operate in isolation. Judges, lawyers, experts, court staff, public institutions, and litigants increasingly work within environments in which AI-assisted research, drafting, summarisation, and document analysis are becoming more accessible. Although AI has not been formally integrated into Jordanian judicial decision-making, some interviewed judges reported limited individual use of publicly available AI tools. Such use may occur without secure hosting, reliable verification, judicial data protection, institutional monitoring, or clearly defined responsibility. (P7, P18)

A strategy based solely on resistance may therefore fail to prevent AI use. Instead, it may delay institutional involvement until tools have already entered judicial practice in fragmented and

[389] Susskind 2019, p. 272.
[390] Stanford Institute for Human-Centered Artificial Intelligence 2026, p. 178.
[391] OECD 2026, p. 1.

uncontrolled ways. The absence of formal adoption does not necessarily preserve a technology-free judicial process. It may instead permit an unregulated diffusion of AI through individual practices that are difficult to identify, supervise, or correct.

The appropriate response is therefore neither passive resistance nor unrestricted adoption, but the development of a normative framework capable of assessing different uses before they become widespread or informally established. The relevant question is not whether AI should be accepted or rejected in general, but how its use should be evaluated according to its function, influence, and implications for judicial values. The following sections examine the considerations required for that assessment.

7.2 Use-Specific Assessment and Classification of AI Uses in Judicial Decision-Making

The normative assessment of AI in judicial decision-making requires more than identifying its technical capabilities or comparing expected efficiency gains with general technological risks.[392] The assessment should therefore begin with the judicial need to be addressed, the nature of the function performed by the system, and the availability of less risky alternatives.[393] It should not begin from the assumption that a commercially available or technically effective system ought to be introduced into judicial practice.

The proposed framework operates at three related levels that carry different normative weight. The first consists of foundational judicial values that set substantive limits on acceptable AI use. The second consists of operational safeguards through which AI-related risks may be prevented, identified, or controlled. The third concerns the institutional benefits and outcomes that may justify considering AI where the relevant judicial values and safeguards can be adequately protected.

7.2.1 Foundational Judicial Values

The foundational values relevant to judicial AI are human dignity, judicial independence and impartiality, procedural fairness and equality, individualised justice, and responsible and reasoned adjudication. These values do not merely regulate the quality of judicial

[392] Paar 2025, pp. 1390–1391.
[393] Komoda 2023, p. 189.

administration. They define the nature of the judicial function and establish limits beyond which technological assistance should not extend.

Human dignity requires parties to be treated as persons possessing individual worth, rights, experiences, and circumstances, rather than being reduced to data points, behavioural categories, or statistical probabilities. This concern is particularly significant where AI is used to assess dangerousness, likelihood of reoffending, credibility, truthfulness, or other personal characteristics.[394] Even where such systems claim a degree of predictive accuracy, their use may affect dignity if the individual is judged primarily through correlations derived from groups or historical patterns. The manner in which a person is assessed is therefore normatively important, not merely the statistical quality of the resulting prediction.[395]

Judicial independence and impartiality require that the authority to identify the legally relevant facts, interpret the law, assess the evidence and arguments, and reach the final conclusion must remain with the legally authorised judge. The threat to independence does not arise only where AI formally replaces the judge. It may also arise where an automated recommendation is presented as highly reliable, becomes institutionally preferred, or is difficult to disregard under substantial workload and time pressure. The relevant inquiry is therefore not whether the judge formally signs the decision, but whether the judge retains genuine control over its reasoning and outcome.[396]

AI's outputs remain shaped by its design, training data, institutional configuration, and the decisions of those who develop and operate it.[397] Judicial independence therefore requires not only formal human involvement but also protection against indirect technological or institutional pressure that may weaken the judge's capacity to reason and decide independently.

Procedural fairness, equality, and non-discrimination require that AI use should not impair the parties' rights to be heard, receive equal treatment, examine the material influencing the decision, and challenge adverse information.[398] A party should not be affected by an automated output whose origin, relevance, or reliability cannot be meaningfully questioned.

Equality also requires consideration of whether the system produces different levels of accuracy or disadvantage for particular persons or groups. Historical judicial and social data

[394] Sroka 2024, p. 264.
[395] Sroka 2024, p. 265.
[396] Paar 2025, pp. 1391–1397.
[397] Gans-Combe 2022, p. 186.
[398] Lopes 2025, pp. 49–51.

may reflect existing patterns of inequality. A system may reproduce or strengthen those patterns even where the discriminatory effect was not deliberately designed. Formal consistency in the treatment of cases is therefore insufficient if the underlying system creates or reinforces unequal treatment.

Individualised justice and contextual sensitivity require each dispute to be determined according to its particular facts, legal issues, arguments, and relevant circumstances. AI systems generally operate by identifying similarities, patterns, and regularities. These capabilities may improve consistency, but they may also obscure legally significant differences or treat an exceptional case as merely a variation of a previous pattern.[399] The judge must retain the ability to distinguish the present case from apparently similar cases, recognise new social or legal circumstances, and depart from established patterns where a justified interpretation of the law requires it.[400]

These values are connected to the requirement of responsible and reasoned adjudication. A judicial decision is not merely a legally correct or efficient outcome. It is an exercise of public authority through which the judge addresses the parties' claims, explains the application of the law to the particular dispute, and assumes responsibility for the conclusion.[401] AI may assist in organising or preparing reasons, but it cannot replace the institutional and legal responsibility attached to human judge.

7.2.2 Operational Safeguards

The second level of the framework consists of operational requirements governing the design, deployment, and use of AI in judicial decision-making. Unlike the foundational values identified above, these requirements do not define the ultimate purposes of adjudication. Rather, they provide the practical conditions through which those values may be protected when AI is introduced into judicial work. They include accuracy and verifiability, transparency and contestability, accountability and traceability, confidentiality and data security, and meaningful human oversight.

Accuracy must be assessed together with verifiability. In judicial decision-making, an apparently minor error may alter the understanding of the dispute. A summary may omit a decisive fact, a research tool may fabricate or misstate a legal authority.[402] The relevant

[399] Sroka 2024, p. 262.
[400] Gans-Combe 2022, p. 186.
[401] Brennan-Marquez and Henderson 2019, p. 141.
[402] Komoda 2023, pp. 171–172.

question is therefore not only whether the system performs accurately on average, but whether its errors can be detected and corrected before they influence the decision. The required level of accuracy and verification should also depend on the function performed and the consequences of error. A mistake in a preliminary document index does not carry the same normative significance as an error affecting the evaluation of evidence, or the final legal conclusion.

Transparency does not necessarily require judges or parties to understand every technical component of a complex model. However, they should understand the system's intended function, principal limitations, sources of information, and the nature and status of its output.[403] Where an AI output materially influences the information or reasoning relied upon in adjudication, an appropriate degree of disclosure should permit the judge and, where relevant, the affected parties to examine and contest its use. Contestability is especially important where the output affects procedural rights, evidence evaluation, or the treatment of a particular party. An output that cannot be meaningfully challenged should not become a decisive basis for the exercise of judicial authority. It has been argued that due process may require not only access to relevant information but also an explanation sufficient to understand and challenge the operation of an AI system, with some accounts extending this requirement to aspects of its underlying logic or source code.[404] The existence and scope of such a right remain contested.[405] For the purposes of the present framework, the relevant requirement is functional: an AI output should not become a decisive basis for judicial authority where it cannot be examined and contested to the degree required by the function it performs.

Accountability requires that AI should not create a gap in legal or institutional responsibility. Judicial decisions remain the responsibility of the judge, but this does not remove the responsibilities of court administrations, technical units, or technology providers. Responsibilities should therefore be clearly allocated across the system's lifecycle, including its acquisition, deployment, monitoring, validation, and oversight.[406]

Confidentiality, data protection, and security are particularly important because judicial files may contain sensitive personal, commercial, financial, family, medical, or criminal

[403] Reiling 2020, p. 6.
[404] De Miguel Beriain 2018, p. 52.
[405] Wachter, Mittelstadt and Floridi 2017, pp. 76–78; Selbst and Powles 2017, pp. 233–234.
[406] Contini, Ontanu and Velicogna 2024, pp. 14–15; see also National Institute of Standards and Technology 2023, pp. 21, 23, 35.

information.[407] AI use may create risks of unauthorised access, data leakage, external storage, secondary use, or the incorporation of case information into the development of external models. The assessment should therefore consider where judicial data are processed and stored, who can access them, whether they are transferred outside judicial infrastructure, and whether they may be reused for purposes unrelated to the proceedings.[408]

Meaningful human oversight brings the operational safeguards together. It requires more than keeping the judge formally "in the loop." The judge must have the practical competence, authority, information, and time required to understand the nature of the output, verify its basis, question its relevance, reject it, and provide independent reasons.[409]

Oversight is not meaningful where automated recommendations are routinely accepted, where outputs cannot realistically be examined, or where workload pressures reduce human review to formal approval. Training alone is also insufficient if the system is institutionally designed or presented in a manner that discourages disagreement. Where effective oversight cannot be maintained in practice, the relevant use should not be permitted merely because formal human involvement remains present. In this regard, As Paar aptly observes, the concept of human involvement should be assessed realistically rather than treated as a formal safeguard: "we should take these remaining human in the loop scenarios for what they are, even if it results in prohibiting AI in certain aspects of the judicial decision-making process altogether".[410]

7.2.3 Institutional Benefits and Outcomes

The third level concerns the institutional benefits and outcomes that may support the use of AI. These include efficiency, reduction of workload, consistency, improved access to legal information, access to justice, and public trust.[411] Unlike foundational judicial values, these benefits do not establish absolute requirements. Their significance depends on whether they can be achieved without undermining the values and guarantees that give adjudication its legitimacy.

AI may reduce the time required to review extensive documents, identify relevant information, search legislation and case law, and prepare repetitive or descriptive parts of judgments. These

[407] Reiling 2020, p. 6.
[408] CEPEJ 2018, p. 56.
[409] Reiling 2020, pp. 6–7; see also Paar 2025, pp. 1395–1396; Laux 2024, pp. 2855–2856, 2858–2859.
[410] Paar 2025, p. 1403.
[411] Nowotko 2021, p. 2225; see also CEPEJ 2018, p. 64.

functions may be particularly valuable in judicial systems facing substantial caseloads, delays, fragmented legal information, or limited technical and administrative support.

Efficiency is nevertheless an instrumental rather than overriding value. Rising caseloads and prolonged proceedings may provide strong reasons to consider AI-based assistance,[412] but they do not establish its necessity. The relevant question is whether a particular application can produce meaningful efficiency gains without undermining the judicial values and safeguards identified above.

Consistency may also constitute a legitimate benefit. AI may help judges identify similar cases, detect differences in judicial practice, and locate relevant lines of authority.[413] However, consistency must be distinguished from uniformity. Similar cases should generally be treated similarly, but legally significant differences must remain capable of affecting the outcome.

Improved access to legal information may strengthen the quality of adjudication by enabling judges to identify relevant legislation, judgments, and arguments more rapidly. Access to justice has both a rights dimension and an institutional dimension. AI may contribute to it indirectly by reducing delay, improving access to legal information, or allowing judicial resources to be concentrated on matters requiring human assessment.[414] Such improvements remain relevant only where minimum procedural and substantive guarantees are preserved.

Public trust and institutional legitimacy may be strengthened where AI helps courts operate more effectively while remaining transparent, accountable, secure, and subject to genuine judicial control. Conversely, trust may be weakened where the public perceives that judicial authority has been transferred to an opaque system or to an external technology provider.

7.2.4 The Balancing Process

The three levels should not be balanced mechanically. Legal compliance and the minimum guarantees arising from human dignity, judicial independence, procedural fairness, equality, and the right of effective access to justice establish limits within which institutional benefits may be pursued. Where a restriction on a protected interest is legally permissible, its justification must be assessed under the applicable legal standard, including necessity and proportionality where relevant. Only residual risks that remain within those legal limits may then be weighed against the expected institutional benefits. As Zalnieriute, Moses, and

[412] Nowotko 2021, p. 2226.
[413] Zalnieriute, Moses and Williams 2019, pp. 445–448; see also Komoda 2023, pp. 171–172.
[414] Ulenaers 2020, pp. 21–22.

Williams persuasively argue: “humans must evaluate each decision-making process and consider what forms of automation are useful, appropriate and consistent with the rule of law. The design, implementation and evaluation of any automated components, as well as the entire decision-making process including human elements, should be consistent with such values”.[415]

The assessment should then consider the nature and necessity of the claimed benefit.[416] The existence of some practical advantage is insufficient. The benefit should respond to an identified judicial problem and be sufficiently substantial to justify the introduction of new risks. The assessment should also examine whether the benefit is supported by evidence or is based only on promotional claims made by technology providers.

The seriousness of the risk depends partly on the function performed by the system and its proximity to the core of adjudication. A tool used to locate documents generally creates a lower level of risk than a system used to evaluate evidence, formulate legal reasoning, or recommend an outcome. The effectiveness of safeguards must be assessed realistically rather than formally. A theoretical possibility of verification is insufficient where judges lack the time, information, or technical capacity to conduct it. Similarly, the possibility of rejecting an automated recommendation does not establish meaningful oversight if the system is treated institutionally as authoritative or if departure from its recommendation requires additional justification.

A proposed AI use should also be compared with realistic alternatives for the same judicial task, including institutional, human, procedural, and conventional digital measures. The comparison should consider the additional benefit claimed, the residual risks, and the relevant costs and workload implications. Where an available alternative achieves the relevant objectives with a materially lower overall burden, the case for AI requires stronger justification. This is a comparative assessment; it does not require AI to be treated as a measure of last resort. AI may also supplement, rather than replace, existing forms of judicial support.

7.2.5 Classification of AI Uses

The classification should focus on the substance of the function rather than the label attached to the technology. A system described as providing “assistance” may nevertheless exercise strong practical influence over the outcome, while an advanced AI system may remain relatively low risk where it performs a narrow and verifiable function. The same technology

[415] Zalnieriute, Moses and Williams 2019, p. 455.
[416] CEPEJ 2018, p. 60.

may therefore fall into different categories depending on how it is used, the information it processes, the consequences of error, and the degree of reliance placed upon its output.

The classification identifies the level of assessment and safeguards required by a particular function; it does not itself constitute authorisation to deploy a specific AI system. A function classified as acceptable in principle remains subject to compliance with the baseline legal, technical, and institutional conditions identified in this framework. Likewise, a conditional function requires additional safeguards because of its closer relationship to evidence assessment, legal reasoning, or judgment construction. Deployment of any particular system therefore depends separately on evidence concerning its legality, performance, security, and institutional controls.

Uses acceptable in principle, subject to the baseline conditions of this framework, are those in which AI performs informational, descriptive, or preparatory functions that remain sufficiently distant from substantive judicial assessment and the determination of the outcome. Examples may include extracting basic information from case files, identifying dates and procedural events, producing preliminary document summaries, retrieving and organising identifiable legal sources, and assisting with purely descriptive or procedural parts of draft judgments.[417] Such uses remain acceptable only where they are verifiable and do not determine which disputed facts should be accepted, how the law should be interpreted, or which party should succeed.

Conditional uses, subject to additional safeguards, are those that approach legal reasoning, evidence assessment, or judgment construction and may therefore shape the judge's understanding of the dispute.[418] They include analysing precedents, comparing the facts of the present case with previous decisions, structuring the parties' arguments, preparing preliminary legal analysis, and assisting in the examination of expert reports. These functions may provide substantial assistance in complex or information-intensive cases, but they require stronger safeguards because their outputs may frame the dispute. A precedent-analysis tool may overstate similarities between cases. A system examining expert evidence may identify inconsistencies or unsupported conclusions, but its assessment should not substitute for the expert's professional role or the judge's evaluation. Conditional uses may therefore be permitted only where the sources and basis of the output are identifiable, the system's limitations are understood, and the output remains practically reviewable, modifiable, and

[417] Sroka 2024, p. 270.
[418] Sroka 2024, p. 270.

rejectable. The judge must independently determine the relevant facts, interpret the applicable law, evaluate the evidence and arguments, and formulate the final reasons. Where practical experience shows that these conditions cannot be maintained, the use should be restricted or suspended.

Uses excluded under the proposed framework are those that transfer effective authority over the judicial outcome to AI or reduce the judge to a formal approver of an automated conclusion. This category includes fully automated judgments and systems whose proposed outcome becomes, in practice, the default decision. It may also include opaque systems used to assess dangerousness, likelihood of reoffending, credibility, or similar characteristics where their outputs effectively determine the decision, become presumptively authoritative, or cannot be meaningfully examined and challenged.[419]

The objection to these uses is not limited to the possibility of technical error. Their function may conflict with the human, legal, and responsible character of adjudication itself.[420] A person should not be subjected to the exercise of coercive judicial authority primarily on the basis of statistical categorisation or an automated assessment that cannot adequately account for individual circumstances.[421] Such uses may impair human dignity, procedural fairness, and individualised justice even where the system claims a high level of predictive performance.[422]

Deployment status should therefore be recorded separately from functional classification, ranging from an unevaluated candidate use to controlled testing, restricted approval for a specified workflow and system version, or suspension and withdrawal where the required conditions are no longer satisfied.

7.2.6 7.2.6 Illustrative Application of the Framework to Selected Tasks

The classification in 7.2.5 identifies the level of assessment and safeguards required by the nature of a proposed AI use. It does not, however, determine whether a particular application should be adopted. Nor does the present study undertake the comprehensive comparative assessment that would be required before deployment. Rather, the following illustrations show how the framework identifies the questions, comparators, safeguards and evidence that a future task-specific assessment would need to address.

[419] See CEPEJ 2018, pp. 66–67.
[420] Gutiérrez 2025, p. 32.
[421] Sroka 2024, pp. 260–262.
[422] Sroka 2024, pp. 254–264.

The examples are deliberately limited to four narrowly defined tasks related to the functional areas examined in Chapter Eight. They draw on the judicial needs and existing forms of support identified in the earlier chapters without assuming that AI is superior to those alternatives. Table 4 illustrates how the framework may be applied provisionally to these selected tasks.

Table 4 Illustrative Application of the Framework to Selected Judicial Tasks

Proposed task	Realistic comparator	**Key assessment issue**	Provisional position
Source-Linked Fact Extraction	Manual file review and existing case-management tools	Omissions, attribution errors, and verification on Jordanian case files	Justifies task-specific evaluation, subject to reliability and verification testing.
Legal Research and Argument Retrieval	Existing legal databases, judge-led research, and available human research support	Accuracy, completeness, currency, and verification burden	Justifies comparative evaluation as additional research support.
Descriptive and Procedural Drafting	Manual drafting, templates, previous judgments, and existing drafting aids	Fidelity to verified inputs and risk of unsupported additions	Justifies evaluation for routine drafting; legal reasoning requires separate assessment.
Expert-Report Organisation and Review	Judicial review, expert clarification, and further expert examination where necessary	Whether technical observations can be meaningfully verified and challenged	Justifies evaluation as supplementary support; substantive technical assessment requires stronger safeguards.

7.3 Chapter Conclusion

This chapter has developed a normative framework for assessing the use of AI in judicial decision-making. The framework distinguishes between foundational judicial values,

operational safeguards, and institutional benefits, while recognising that these considerations do not carry equal normative weight. The assessment of a particular AI application should therefore begin with legality and an identified judicial need, consider whether less risky alternatives can provide comparable benefits, evaluate the seriousness and controllability of the relevant risks, and determine whether meaningful judicial oversight can be maintained in practice.

On this basis, AI uses may be classified as acceptable in principle, subject to baseline conditions; conditional on additional safeguards; or excluded under the proposed framework, according to the function performed, its proximity to the core of adjudication, the consequences of error, and the extent of effective human control. This framework does not presume either the adoption or rejection of AI. The framework would require reconsideration if uses treated as relatively distant from adjudicative authority were shown in practice to exert substantial influence over judicial outcomes, or if uses subject to enhanced safeguards proved incapable of meaningful verification and review under realistic judicial working conditions.

8. Potential AI Functions for Addressing Judicial Decision-Making Challenges in Jordan

The previous chapter developed a normative framework for assessing the use of AI in judicial decision-making. It argued that AI should not be accepted or rejected in abstract but should be evaluated according to the nature of the benefit it provides, the risks it creates for judicial values, the availability of less risky alternatives. This chapter builds on that framework by moving from normative assessment to functional analysis. Its purpose is to examine how specific AI tools may support judicial decision-making in Jordan in response to the challenges identified in the earlier chapters.

The central premise of this chapter is that AI should not be introduced into the judiciary merely because it is technologically available or because other legal systems have begun experimenting with it. In the Jordanian context, the justification for AI must be linked to demonstrated judicial needs. The earlier chapters showed that Jordanian judges face several interconnected challenges, particularly heavy caseloads, time pressure, limited research support, difficulties in judgment drafting, and problems related to the quality and evaluation of expert evidence. These challenges provide the practical context within which the possible role of AI should be examined. These challenges do not justify applying AI to every judicial task. Judicial decision-making involves several stages, some of which may benefit from technological support, while others depend on judicial discretion, legal interpretation, and human responsibility. The key question is therefore which tasks AI may appropriately support without undermining the judge's role.

This chapter adopts a selective, function-based approach to AI in judicial decision-making. It examines AI as a tool for supporting specific judicial tasks rather than replacing judges or addressing all institutional problems. Drawing on interviews with 18 Jordanian judges, it assesses the use of AI in document summarisation, information extraction, legal research, precedent analysis, expert evidence, and judgment drafting, with particular attention to its suitability for the Jordanian judicial context.

8.1 Fact Extraction and Document Summarisation

The previous chapters showed that one of the practical challenges facing judicial decision-making in Jordan is not only the number of cases before the courts, but also the volume and complexity of the materials contained in individual case files. A single case may include

pleadings, memoranda, contracts, official records, expert reports, supporting documents, and previous judicial decisions.[423] Whether these materials are available in paper or electronic form, they may impose a significant burden on judges, particularly where the relevant facts are dispersed across several documents or where the file contains repetitive, procedural, or marginal materials.[424]

These difficulties create a potential role for technological support in fact extraction and document summarisation.[425] This need is particularly important because many existing legal information systems still rely on manual summarisation prepared by legal specialists, which may be time-consuming and limited in its ability to respond dynamically to the specific facts of each case.[426] AI-assisted fact extraction and document summarisation may provide a functional response to this challenge, not by replacing the judge's careful reading of the case file, but by supporting judges in navigating complex materials more efficiently. In this respect, AI may help identify legally relevant facts, organise information, and produce preliminary summaries, thereby enabling judges to focus more quickly on the substantive issues in dispute. This potential reallocation of judicial time is consistent with Komoda's observation that such tools "would allow courts to invest more time and resources in tasks that require human touch and consequently improve the quality of legal services."[427]

Not all material contained in court documents is equally important for understanding the dispute or forming the judicial truth on the basis of claims and evidence. Some information is central to the dispute, while other information may be repetitive or only indirectly relevant. A well-designed AI tool could assist the judge by identifying key dates, parties, claims, defences, evidentiary references, procedural history, and relevant documents. This may save time and reduce the distraction that arises from dealing with large volumes of text, especially in document-heavy or technically complex cases.

From the technical perspective discussed in Chapter Five, fact extraction and document summarisation are mainly applications of natural language processing. However, they should not be reduced to one technical model. Some systems rely on extractive techniques that identify

[423] Polsley, Jhunjhunwala and Huang 2016, pp. 258–262.
[424] Deroy, Ghosh and Ghosh 2023, p. 8.
[425] Polsley, Jhunjhunwala and Huang 2016, p. 258.
[426] Deroy, Ghosh and Ghosh 2023, p. 6.
[427] Komoda 2023, p. 164.

relevant passages from the original text, while more recent tools may use machine learning, deep learning, or large language models to generate abstractive summaries.[428]

Recent studies and tools show that AI may have significant potential in this area. For example, one study evaluated the performance of GPT-4 in extracting facts from UK Employment Tribunal judgments and reported high accuracy across the tested categories.[429] The significance of this type of automatic information extraction lies in its ability to simplify the analysis of large volumes of legal texts and support related tasks such as case understanding, case management, and document summarisation.[430] However, such results should be treated as evidence of potential rather than as proof that these tools are ready for unrestricted judicial use. Their relevance to Jordanian courts would still depend on their performance on Arabic legal materials, Jordanian case files, and the specific types of documents used in domestic proceedings.

In the context of summarisation, two main approaches can be distinguished. The first is extractive summarisation, where the system selects specific passages from the original document on the assumption that they represent the most important parts. Examples discussed in the literature include tools and models such as CaseSummarizer, BERTSum, and SummaRuNNer.[431] The second is abstractive summarisation, where the system analyses the original text and generates a new summary in its own language. This may involve general-purpose LLM, such as ChatGPT, or legal-domain models designed for long legal texts, such as Legal-Pegasus and Legal-LED.[432] Extractive summarisation may appear safer because it remains closer to the original text, but it may still omit legally significant information if the system misidentifies what is important. Abstractive summarisation may be more readable and coherent, but it carries a greater risk of distortion, omission, or the generation of inaccurate information.

Institutional examples also illustrate the growing interest in AI-assisted summarisation and case-file analysis. The AI Saransh initiative in India, for instance, has been presented as an AI-assisted tool designed to generate concise summaries of legal pleadings and other case materials, thereby helping judges and legal professionals identify the main issues and relevant

[428] Parmar et al. 2024, pp. 19810–19811.
[429] Ribeiro de Faria, Xie and Steffek 2025, p. 14.
[430] Ribeiro de Faria, Xie and Steffek 2025, pp. 2–3, 5.
[431] Shukla et al. 2022, p. 1052.
[432] Deroy, Ghosh and Ghosh 2023, pp. 8–9.

information more efficiently.[433] Similar developments can be observed in Spain, where the Ministry of Justice has developed in-house NLP and generative AI tools to classify, summarise, anonymise and analyse judicial documents.[434] These tools can extract names, dates, monetary values and relationships between entities, and are integrated with digital justice platforms such as LexNET, where extracted information can automatically populate forms that were previously completed manually.[435] Brazil provides a further example through MARIA, an LLM-driven tool used by the Brazilian Supreme Court to summarise documents, produce first drafts of reports and conduct preliminary assessments to identify incoming cases that may be connected to judicial precedents.[436] Taken together, these examples show a broader institutional movement towards using AI to reduce repetitive document-processing tasks, improve access to relevant information and support preliminary legal analysis. Their significance for this study is not that they should be copied directly into Jordan, but that they demonstrate how AI tools may assist judges and court staff in managing large volumes of legal information.

Despite this potential, a study on legal summarisation shows that fully automated use remains problematic. Research using Indian Supreme Court judgments found that abstractive summarisation models and LLMs sometimes generated incorrect dates and person names and confused different persons associated with a case.[437] Although some abstractive models achieved stronger results according to traditional summarisation metrics, the study concluded that such tools are not yet ready for fully automatic summarisation in a complex domain such as law, and that a human-in-the-loop approach remains more appropriate.[438] This finding is important because a legal summary is not merely an administrative convenience. If placed before a judge, it may influence which facts appear central and which documents seem less important.

These studies concern completed judgments and should not be treated as validating the analysis of pending case files. In pending proceedings, a reliable system would need to distinguish allegations, admissions, disputed facts and judicially established facts, link each statement to its source, and be tested for omissions and misattribution as well as inaccurate inclusions.

[433] Hybrid Minds 2024.
[434] OECD 2025a, p. 266.
[435] OECD 2025a, p. 267.
[436] OECD 2025a, p. 267.
[437] Deroy, Ghosh and Ghosh 2023, p. 2.
[438] Deroy, Ghosh and Ghosh 2023, pp 17–18.

For this reason, the main functional limit is that these tools must remain preliminary and verifiable. Summaries should help judges navigate the file, not replace examination of the original documents, especially where facts are disputed or legally significant. Extracted information must also be traceable to its source, allowing the judge to verify any identified date, party, claim, or document. Without such traceability, the tool may save time initially but create new difficulties for judicial reasoning.

The use of AI-generated summaries may also raise questions of professional trust and acceptance. Although the available evidence is not specific to legal summarisation, one experimental study found that lawyers and law students evaluated legal documents less favourably when they believed them to be AI-generated, even though the documents were in fact human-authored. The authors further observed that the AI-generated label carried negative associations concerning document quality and its perceived adequacy to produce legal consequences.[439] This point should not be overstated, but it indicates that acceptance of these tools depends not only on technical performance, but also on whether judges and legal professionals understand their limits and can review their outputs. In this sense, caution may serve a useful function if it encourages judges to treat AI summaries as aids rather than authoritative accounts of the case.

Under the framework developed in Chapter Seven, basic fact extraction and source-linked, verifiable summarisation generally warrant baseline assessment, while interpretive or abstractive summarisation requires enhanced assessment where it may influence the understanding of disputed facts. Deployment status remains separate and should depend on task-specific testing on Arabic legal materials, Jordanian case files and the types of documents used in domestic proceedings.

8.2 Legal Research and Argument Retrieval

The interviews with Jordanian judges indicate that current legal research tools are useful, but they do not fully solve the practical problem of identifying the most relevant legal materials for the case under consideration. Judges may still need to search extensively within the results to find the provisions, precedents, or arguments that are most relevant to the dispute.

Participants described the legal research tools available to them at the time of the interviews, including Qistas and Qararak, as useful but still requiring judge-led searching and filtering (P3, P4, P5, P6, P13 and P14). These tools do not automatically analyse the case file, claims, facts,

[439] Harasta, Novotná and Savelka 2026, pp. 180–181.

or legal issues in order to suggest relevant laws, amendments, precedents, or doctrinal sources. The research process therefore remains largely manual, keyword-dependent, and judge-initiated.

This is the point at which AI-supported legal research may offer a distinct functional contribution. An AI tool integrated with the case file could, at least in principle, analyse the factual and legal elements of the dispute and provide the judge with alerts or suggestions concerning the most relevant and recent legal provisions, judicial precedents, and legal arguments. Such a tool would not merely replace manual keyword searching. Rather, it could reduce the time spent searching within search results and help the judge identify legal materials that are more directly connected to the dispute. This may improve efficiency by saving judicial time and may also enhance the quality of judgments by broadening the judge's awareness of relevant and updated legal sources.

The value of such tools is not limited to legislation and precedents. The interviews also indicate that many judges lack effective tools that provide access to doctrinal or scholarly legal sources. This is significant because judicial reasoning may sometimes require more than locating statutory provisions or previous judgments. It may also require engagement with legal doctrine, scholarly commentary, interpretive approaches, and broader legal arguments. AI-supported legal research could therefore support both efficiency and quality if it enabled judges to access legal texts, case law, and relevant doctrinal sources in a structured and searchable way.

Comparative examples illustrate different forms of AI-enabled legal support. Westlaw Edge historically incorporated AI-assisted tools for authority retrieval and analysis.[440] Blue J illustrates a different function by combining legal research with predictive analysis,[441] while SUPACE represents institutional search support for judges.[442] These examples are used according to their particular function and should not be treated as equivalent evidence for the same research task.

The functional contribution of AI in this area lies in its ability to search large datasets, identify potentially relevant materials, and connect legal texts, precedents, and arguments. Traditional legal research often requires the judge or researcher to know the correct keywords, search across separate sources, and manually determine which results are relevant. AI-supported tools may improve this process by allowing more natural queries, identifying semantically related

[440] Thomson Reuters n.d.
[441] Wilbur 2023.
[442] Ministry of Law and Justice (India) 2025.

materials, and retrieving sources that may not contain the exact words used by the judge but still address the same legal issue.

However, the usefulness of these tools should not be confused with legal authority. Their role should remain supportive. They may help the judge locate legal materials, but they do not determine their legal meaning or their relevance to the dispute. A legal text or precedent becomes relevant only through interpretation. The judge must still decide whether a provision applies, whether a precedent is distinguishable, whether a doctrinal argument is persuasive, and whether the retrieved material actually supports a particular conclusion. In this sense, AI may improve the process of finding legal materials, but it cannot replace the judicial act of selecting and interpreting them.

This distinction is particularly important because recent research has shown that AI-based legal research tools may still produce unreliable outputs. One study evaluating three AI legal-research tools from two vendors found that the systems sometimes produced hallucinated or partially inaccurate results, including answers supported by incorrect sources.[443] The findings support verification of source existence, quotation accuracy, currency and possible omission of relevant contrary authority, but they do not establish the error rate of every later product or version.[444] Assessment should therefore attach to the tested workflow and version rather than to a commercial product category.[445]

Another functional limit concerns legal terminology. Legal research does not depend only on identical words. It often requires recognising equivalent concepts, related expressions, and the legal meaning of terms used in context.[446] Judges, lawyers, legislators, and scholars may use different expressions to describe the same legal issue. A statutory provision may use one term, while judgments and pleadings use another. This linguistic variation may reduce the effectiveness of tools that rely heavily on matching terms across legal datasets.[447] The challenge may be even more significant in Arabic legal materials, where drafting styles, judicial formulations, and doctrinal expressions may vary considerably. For this reason, AI legal research tools used in Jordan should not be evaluated only on their general technical

[443] The study evaluated three AI legal-research tools from two vendors: LexisNexis (Lexis+ AI) and Thomson Reuters (Westlaw AI-Assisted Research and Ask Practical Law AI). See Magesh et al. 2025, pp. 224–225.
[444] Magesh et al. 2025, p. 233.
[445] Magesh et al. 2025, pp. 233–234.
[446] Guan et al. 2025, pp. 4–5.
[447] Guan et al. 2025, pp. 4–5.

performance, but also on their ability to deal with Arabic legal language and Jordanian legal sources.

Under the framework developed in Chapter Seven, source-grounded retrieval and organisation of identifiable legal materials generally warrant baseline assessment, while case-sensitive precedent analysis and argument retrieval require enhanced assessment because they may influence how the legal issues are framed. These functions may provide useful research support, but deployment remains a separate question and depends on task-specific testing and verification.

8.3 AI-Assisted Judgment Drafting and Legal Reasoning

As established in Chapter Two, judgment drafting is one of the most time-consuming stages of judicial work. It is not a single homogeneous task but rather consists of components that differ in their legal importance and level of risk, ranging from descriptive and procedural sections to the assessment of evidence, legal reasoning, the application of the law, and the final ruling. Accordingly, AI-assisted judgment drafting should not be treated as a single function. The relevant question is not whether AI should draft judgments in general, but which parts of the drafting process may appropriately be supported by AI, under what conditions, and with what degree of judicial verification.

Although some of the information used in judgment drafting overlaps with the outputs of fact extraction and document summarisation, the two functions remain distinct. Fact extraction and document summarisation are intended primarily to assist judges in understanding and navigating the case file. By contrast, AI-assisted judgment drafting uses information that has already been identified and verified to generate text intended to form part of the judgment itself. The distinction therefore lies not necessarily in the underlying information, but in the purpose, form, and intended use of the output.

This distinction is important for defining the appropriate role of generative AI and large language models in judgment drafting. As discussed in Chapter Five, these systems can generate structured legal text, draft descriptive sections of judgments, summarise procedural history, present the parties' claims and defences in an organised form, and produce preliminary draft language. However, the ability to generate coherent legal text should not be confused with judicial reasoning. The legitimacy of a judicial judgment ultimately depends on the judge's

independent assessment of the facts, interpretation and application of the law, and responsibility for the reasons supporting the decision.

From this perspective, AI-assisted judgment drafting may be understood at two levels. The first concerns the preparation of the descriptive sections of the judgment, such as drafting the procedural background, presenting the parties' claims and defences, summarising the procedural history, and preparing other introductory parts of the provided that they faithfully reproduce verified source material without evaluating disputed facts or legal arguments. At this level, AI organises information that has already been identified and verified without assessing evidence or influencing the outcome. The second concerns comprehensive preliminary drafting, in which the system may integrate the relevant facts, identify applicable legal provisions, organise the legal issues, and generate a preliminary draft that may include proposed legal reasoning. In all cases, however, the resulting draft remains subject to complete judicial review, revision, and approval.

The possibility of using AI to prepare a basic preliminary draft of a judgment is particularly important in the Jordanian context. If such a tool could assist judges in preparing the non-decisive components of a judgment, it could improve efficiency by reducing the time and effort devoted to repetitive drafting tasks. If drafting assistance actually releases judicial time and that time is redirected to substantive adjudication rather than absorbed by additional case assignments, it could allow greater attention to evaluating evidence, analysing arguments and refining judicial reasoning. This is an institutional assumption to be tested in practice, not a benefit established by the technology itself.

This approach is also consistent with existing judicial practice. Judges frequently rely on templates, previous judgments, and standard formulations, particularly in routine or repetitive cases. Such reliance does not undermine the validity or quality of the judgment, provided that the judge adapts the text to the specific facts and legal issues of the dispute. This is particularly evident in cases based primarily on documentary or numerical evidence, such as certain financial claims, commercial paper disputes, and banking claims. From this perspective, AI-assisted drafting may be understood as a more advanced and dynamic form of organisational and drafting support rather than a substitute for judicial decision-making.

Existing judicial practice demonstrates that AI is already being used to assist in drafting descriptive components of judicial decisions rather than merely summarising case files. In Latin America, several judicial institutions have adopted systems that generate preliminary

judicial documents based on structured templates and case-specific information. In Peru, the Amauta Pro system extracts relevant information from police reports and case records to prepare draft protection orders for judicial review. According to the Organisation for Economic Co-operation and Development, this reduced the time required to prepare protection orders from approximately three hours to around forty seconds.[448] Similarly, the Brazilian Supreme Federal Court uses MARIA (AI Writing Support Module) to produce first drafts of judicial reports, which form part of the formal structure of judicial decisions by presenting the procedural background and essential facts before judicial reasoning begins.[449] This reported figure concerns a particular drafting step and does not by itself establish net time savings or preserved legal quality across the full workflow, which would also require consideration of input preparation, judicial verification and correction. In Argentina, Prometea illustrates a comparable template-based approach. The system could classify the type of proceeding, identify relevant precedents, select the appropriate legal-opinion model, and generate a case-specific draft for subsequent review. Its principal initial application, however, was within the Public Prosecutor's Office of the City of Buenos Aires, where it assisted prosecutors in preparing legal opinions rather than independently generating judicial decisions for judges.[450]

A significant example of the second level can be found in the Intelligent Adjudication System introduced by the Shenzhen Intermediate People's Court in China. Liu and Li describe it as the first systematic use of a purpose-trained large language model by a court to generate reasoning for actual civil and commercial judgments.[451] The process begins with the judge, who evaluates the evidence, establishes the relevant facts, identifies the main issues in dispute, and indicates a preliminary conclusion on each issue. The system then generates draft reasoning based on those findings, after which the judge reviews, corrects, and revises the text before finalising the judgment. The study reports that some judges used the system in a substantial proportion of their cases and considered that it reduced the time required for judgment writing.[452]

The Shenzhen experience shows that AI-assisted legal reasoning is already being used in practice. However, the study also identifies serious limitations. Because the system generates arguments supporting the judge's preliminary conclusion, it may reinforce an initial error or bias rather than encourage reconsideration, a risk described by the authors as the "echoes of

[448] OECD 2025a, p. 268.
[449] OECD 2025a, p. 267.
[450] Estevez, Linares Lejarraga and Fillottrani 2020, pp. 24–25; see also National AIDP-Team of Argentina n.d., pp. 6–7.
[451] Liu and Li 2024, pp. 239–241.
[452] Liu and Li 2024, pp. 239–241.

bias."[453] The study further found that hallucinations were not eliminated despite the use of a purpose-trained model, authoritative legal databases, and judicially selected references.[454] Accordingly, the system demonstrates the practical potential of AI-generated draft reasoning, but also confirms that such outputs must remain preliminary, traceable to their sources, and subject to substantive judicial review rather than mere linguistic correction.[455]The Shenzhen evidence therefore informs assessment of this particular human–AI drafting arrangement, while its transfer to Jordanian procedure, language and institutional conditions remains to be tested.

Legal reasoning is not merely the organisation of legal materials. It may require interpreting legal provisions, identifying the purpose and objectives of legal rules, considering their relationship with public order and mandatory norms, applying general legal principles, taking account of custom or the broader social context, and evaluating the particular circumstances of the dispute. It may also require the judge to exercise judicial discretion. Legal reasoning may also involve precedential and analogical reasoning. Precedential reasoning requires considering previous judicial decisions because of their relevance to the dispute before the court.

The ability of AI to perform legal reasoning remains contested. One influential critique argues that genuine analogical reasoning requires more than identifying factual similarities between cases; it also requires evaluative judgment in identifying the normative principle that makes those similarities or differences legally relevant.[456] Other studies take a more optimistic view, suggesting that AI can assist in producing useful forms of legal reasoning, particularly where the task is structured and the model is provided with the relevant legal materials.[457] Empirical studies reflect this mixed picture. One study found that an LLM performed relatively well in a structured legal drafting task, while showing substantially weaker performance in an open-ended legal reasoning task requiring it to identify potentially applicable legal violations from a factual scenario.[458] A separate empirical study testing several LLMs through the Issue-Rule-Application-Conclusion framework likewise found uneven performance across models and legal reasoning tasks.[459] Some models, particularly Claude and Copilot, produced more detailed and relevant responses in the tasks tested, while other models generated shorter

[453] Liu and Li 2024, p. 236.
[454] Liu and Li 2024, pp. 251-252.
[455] Liu and Li 2024, pp. 252-253.
[456] Sunstein 2001, pp. 31–32.
[457] Fournier and Linna 2024, p. 370.
[458] Trozze, Davies and Kleinberg 2025, p. 722.
[459] Peoples 2025, pp. 55–58, 74.

answers, included irrelevant information, produced hallucinations or irrelevant legal citations, or demonstrated weaker application of facts to law.[460] These results suggest that LLMs may be capable of basic forms of legal analysis, but their performance remains uneven in terms of focus, depth, reliable sourcing, and the ability to reach and support legal conclusions. The study also indicates that a law-specific system should not necessarily be assumed to outperform general-purpose models across legal analysis tasks.[461]

These findings support a clear distinction between drafting assistance and substantive AI-generated legal reasoning. Drafting descriptive or procedural text from verified inputs may warrant baseline assessment, whereas proposed legal reasoning requires enhanced and particularly demanding assessment. In both cases, deployment depends on whether outputs can be reliably verified, traced to authoritative sources and independently reconsidered by the judge. Hallucinations, embedded bias and automation bias remain relevant risks where AI contributes to legal analysis.

8.4 AI Support for the Analysis and Integration of Expert Evidence

The earlier chapters established that expert evidence represents one of the significant challenges facing judicial decision-making in Jordan. Legal literature, reports of the JJC, and the empirical interviews with Jordanian judges all indicated that courts often face difficulties in cases requiring technical or scientific expertise. These difficulties relate not only to the cost and duration of expert procedures, but also to the quality, reliability, neutrality, and practical usefulness of expert reports. A particularly important concern is that judges may be required to rely on technical reports in fields outside their legal training, while lacking effective tools that help them verify the soundness of the expert's method, assumptions, or conclusions.[462] The earlier analysis also showed that several measures adopted over the years to improve the expert evidence system have not fully resolved these difficulties.

[460] Peoples 2025. pp. 85-84.
[461] Peoples 2025. pp. 85-84. The study tested several LLMs using legal reasoning tasks structured around the Issue-Rule-Application-Conclusion framework. It found uneven performance across models: some systems provided more detailed and relevant responses, while others produced shorter answers, irrelevant information, hallucinated citations, or weak application of legal rules. The study is useful here not to rank specific models, but to show that LLM performance in legal reasoning remains variable and task dependent.
[462] Brewer 1998, p. 1681.

AI may provide an important functional response to these challenges.[463] Its role should not be understood as replacing human experts or turning judges into technical specialists. Rather, its value lies in assisting judges to understand, review, and integrate expert evidence more effectively within the judicial decision-making process. In this sense, AI can operate as a support mechanism that helps the judge engage more critically with technical material, instead of relying passively on the conclusions of a single expert report.

From the technical perspective discussed in Chapter Five, AI support in expert evidence differs from the tools used for legal research or judgment drafting. It may involve several types of AI, depending on the technical field involved. In some cases, it may rely on machine learning, pattern recognition, computer vision, anomaly detection, statistical modelling, or domain-specific expert systems. In other cases, generative AI may be used to review, organise, or explain expert reports. This diversity is important because expert evidence should not be treated as a single category. The risks and benefits of AI will differ depending on whether the tool is reviewing a medical report, detecting financial fraud, analysing a forged document, or helping the judge understand a technical methodology.

The first scenario considered here is the use of AI as a judicial support tool for reviewing expert reports.[464] In this role, the system would not provide the final technical answer and would not replace the expert. Rather, it would assist the judge in examining the report submitted by the human expert. For example, an AI tool could help identify the assumptions on which the expert relied, the documents examined, the methodology used, the calculations made, and the relationship between the expert's findings and the questions referred by the court.[465] It could also highlight gaps, inconsistencies, unsupported conclusions, missing references, or parts of the report that require clarification.

This type of assistance directly responds to the main difficulty identified in the earlier chapters: the judge's limited ability to technically evaluate expert reports without specialised support. If properly designed, AI could help the judge ask better questions, require further clarification from the expert, compare the report with accepted technical standards, or identify whether the expert has exceeded the scope of the assignment. The value of the tool would therefore lie not

[463] Parts of the analysis in this section draw on the author's related research: Alqatawna, Ammar, and Zsolt Czékmann, "Applying Artificial Intelligence to Strengthen Expert Evidence in Jordanian Judicial Decision-Making," AAU Journal of Business and Law, forthcoming.
[464] Katz 2014, pp. 33–34.
[465] Katz 2014, p. 37.

in replacing the judge's assessment, but in improving the judge's ability to engage critically with expert evidence.

Under the Chapter Seven framework, AI used to organise or assist in reviewing an expert report requires enhanced assessment because its output may influence the judge's understanding of technical material. Any such use should remain traceable, reviewable and non-determinative, with a clear distinction between organisational support and substantive technical conclusions.

Although AI systems designed specifically to help judges review expert reports remain limited, judicial practice already shows that AI can assist in analysing complex evidentiary materials. The Shanghai 206 Criminal Case Intelligent Assistance System, for example, analyses forensic, documentary, and digital evidence, identifies inconsistencies and missing information, and draws attention to matters requiring further examination.[466] These developments suggest that AI could assist judges in examining the methodology, assumptions, calculations, and conclusions contained in expert reports, while leaving the assessment of their evidential weight entirely to the court.

The second scenario is the use of AI as a tool by human experts in preparing expert evidence. AI tools could assist experts in preparing clearer and more complete reports by helping them organise the structure of the report, identify missing information, check calculations, and ensure that the report responds directly to the questions assigned by the court. In this sense, AI would support the expert's work without replacing the expert's professional judgment or responsibility for the opinion presented to the court.

The use of Microsoft Copilot in *Matter of Weber* provides a useful illustration of this scenario. In that case, the expert used Copilot to cross-check his damages calculations, but he could not recall the prompts he had used, identify the sources relied upon by the system, or explain how it produced its results. When the court tested Copilot using the same question on different computers, it produced different calculations, raising concerns about the reliability and consistency of the AI-assisted analysis.[467] The case therefore showed that generative AI may enter expert evidence through the work of human experts, even where the court itself has not adopted an AI system. At the same time, it highlighted the importance of transparency, verification, and the expert's ability to explain and take responsibility for the use of the AI tool.

[466] Jin and He 2020, pp. 533–535.
[467] Matter of Weber, 2024 NY Slip Op 24258, 85 Misc 3d 727 (Sur Ct, Saratoga County 2024).

The court ultimately held that the use of AI in generating evidence must be disclosed and that such evidence should be subject to a *Frye* hearing before admission.[468]

The third scenario is the use of AI to provide independent technical assessments in limited categories of cases. This is the most sensitive use. In some areas, AI tools may already be capable of assisting with tasks such as damage estimation, fraud detection, document analysis, image comparison, medical assessment support, or the identification of technical patterns in large datasets. Many of these tools were not originally developed for courts, but they are already used in fields such as medicine, banking, insurance, forensic analysis, and financial compliance. This suggests that courts may not always need to build entirely new systems. Existing tools may, in some cases, be adapted for judicial use. Nevertheless, adapting existing tools to the justice system requires more than changing the user interface. A tool that is useful in a commercial, medical, or administrative setting may not automatically be suitable for judicial decision-making. Court use requires legal reliability, procedural fairness, traceability, and the ability of the parties to challenge the basis of the assessment. Therefore, AI-generated technical assessments should be limited to clearly defined, objective, and verifiable tasks. They should not be used as independent substitutes for human experts in complex or disputed scientific matters unless their methodology is validated, explainable, and open to adversarial testing.

In the Jordanian context, AI could therefore play an important role in improving expert evidence, but this role should be introduced gradually and according to the level of risk. The safest and most immediately useful role is to assist judges in understanding and reviewing expert reports. A second, more institutional role is to assist experts and courts in improving the quality and management of expert work. A third and more restricted role is to allow AI to provide technical assessments in limited, objective, and verifiable matters.

The normative classification of AI in expert evidence should therefore depend on the particular function performed. AI used to organise, explain, or assist in reviewing an expert report may fall within uses acceptable in principle or uses requiring additional safeguards where its outputs remain traceable and non-determinative. By contrast, AI-generated independent technical assessments require substantially greater caution and may be acceptable only in narrowly defined, objective, and verifiable tasks where effective judicial and adversarial review remains possible. Its functional benefit is clear because it may reduce delay, improve the quality of

[468] Matter of Weber, 2024 NY Slip Op 24258, 85 Misc 3d 727 (Sur Ct, Saratoga County 2024).

expert reports, help judges understand technical issues, reduce excessive dependence on a single human expert, and lower costs, particularly where an approved AI system can perform a defined expert task across numerous cases, potentially reducing repeated expert fees. However, its acceptability depends on maintaining the judge's responsibility for evaluating the evidence, preserving the parties' ability to challenge expert material, and ensuring that AI outputs are explainable, traceable, and non-determinative. AI may help the judge engage more effectively with expert evidence, but it should not replace the judicial assessment of that evidence or become an invisible expert within the case.

8.5 Interview Findings on Potential Functional Uses of AI

The proposed functional uses of AI in this chapter are supported not only by the theoretical and normative analysis developed in the previous chapters, but also by the perceptions expressed by the interviewed Jordanian judges. These perceptions should not be understood as proof that AI tools will necessarily succeed in practice. The judges had not experienced an official or systematic deployment of AI within Jordanian courts. Their views therefore reflect perceived usefulness, professional expectations, practical needs, and cautious assumptions rather than tested institutional effectiveness. Nevertheless, they are important because they show whether the proposed uses correspond to the realities of judicial work as understood by judges themselves.

A general pattern appears across the interviews. Judges were more receptive to AI where it was imagined as a supportive, organisational, or preparatory tool. Their acceptance was stronger where AI was connected to saving time, organising information, improving access to legal materials, assisting with routine parts of judgments, or helping judges understand expert reports (P1, P3, P4, P5, P6, P8, P9, P12, P15, P16, P17 and P18). By contrast, caution increased when AI was associated with replacing the judge, determining the outcome, or producing a final decision without genuine judicial review. One judge captured this distinction by stating that AI may be used "as a tool that assists the judge, not as a substitute for the judge" (P14). This perception corresponds closely to the framework developed in Chapter Seven, which distinguishes supportive uses under judicial control from uses that transfer substantive judicial authority to the system.

The interviews also suggest that AI use among Jordanian judges is beginning to emerge, but mainly through individual and informal practices rather than institutional adoption (P2, P7, P8, P11 and P13). Some judges referred to colleagues who use AI tools for searching information,

preparing templates, summarising sources, or performing calculations in specific types of cases (P2, P12). These examples are significant because they show that AI is not merely a theoretical possibility for the judiciary. It has already begun to appear at the margins of judicial work, although in an unregulated and non-institutional form. This strengthens the argument that Jordanian courts may eventually need a structured approach rather than leaving such uses to individual initiative.

With regard to fact extraction and document summarisation, the judges' views support the functional value of AI in helping judges deal with large amounts of information. Several judges connected AI with the ability to summarise proceedings, extract relevant parts from lengthy materials, or reduce the time spent on repetitive textual work. One judge referred to the usefulness of having "a comprehensive summary of the proceedings before me," together with the most relevant legal materials and routine components of the case (P7). Several participants viewed summarisation as a way to save time and effort while cautioning against allowing the tool to take over the judgment (P3, P7, P9 and P12). These views support the relevance of summarisation and extraction as candidates for further assessment, provided that outputs remain preliminary, traceable and subject to judicial verification.

The judges' perceptions were also strongly aligned with the proposed use of AI in legal research and argument retrieval. The interviews indicate that AI-supported legal research may be valuable where it links legal texts, judicial precedents, legal interpretations, and doctrinal writings, rather than merely retrieving isolated search results (P3, P6, P8, P10 and P17). One judge described the preferred use of AI as a "strong legal search engine" capable of connecting "the legal text, legal interpretation, judicial precedent, and doctrinal opinion" (P9). This view supports the argument that AI legal research should not be understood merely as faster keyword searching. Its value lies in creating a more intelligent and case-sensitive path to legal materials, while leaving the interpretation and selection of those materials to the judge.

At the same time, judges did not present AI legal research as a replacement for judicial interpretation. Some judges indicated that they had used tools such as ChatGPT to collect possible legal interpretations or to locate relevant discussions but still rejected outputs when they were not persuasive or practically useful (P9 and P14). This is an important empirical qualification. It suggests that judges may find AI useful as an exploratory research tool, but not as an authority that determines the correct legal interpretation.

Judgment drafting was another area in which judges saw clear potential benefit. The interviews indicated that judges distinguish between the routine or descriptive components of a judgment and the substantive reasoning that belongs to the judge (P3, P6, P8, P11 and P12). Most judges referred to the possibility of AI preparing parts of the judgment such as the procedural history, facts, introductions, or the narrative of proceedings, up to the point where the judge begins the legal task of applying the law to the facts (P2, P3, P4, P5, P6, P7, P8, P9, P11, P12, P13, P14 and P18). One judge explained that AI could help in "preparing part of the judicial decision," including the facts and introductions, until "the stage at which the judge begins the legal work of applying the provisions to the facts" (P16). This perception directly supports the distinction developed earlier in this chapter between basic judgment drafting and AI-generated legal reasoning.

This does not mean that judges accepted AI-generated judgments in full. On the contrary, several responses supported a cautious distinction between drafting assistance and decision-making. Judges recognised that tools which prepare descriptive components may save time, but they were more hesitant where the tool moves towards reasoning, evaluation, or final conclusions (P1, P3, P4, P8, P11, P12 and P14). One judge stated that "the personal effort remains better, because each case has its own nature" (P8). These views support further evaluation of AI-assisted drafting for routine, descriptive and verifiable components, while confirming greater concern as the tool moves towards substantive reasoning or final conclusions.

The most practically developed judicial perceptions concerned expert evidence. Several judges saw AI as particularly valuable in helping judges review, question, or verify expert reports (P2, P3, P4, P6, P7, P9, P10, P11, P12 and P14). This is unsurprising because the difficulty of expert evidence lies not only in delay or cost, but also in the judge's limited ability to evaluate technical conclusions outside legal expertise. One judge supported the idea of a tool that would help determine whether an expert was correct, stating that using AI to evaluate expert work was "an excellent idea" and should be encouraged in the Jordanian judiciary (P4).

The interviews also support a differentiated approach to AI in expert evidence. Judges were generally more comfortable with AI as a tool used by the judge to review expert reports or by the expert to improve the quality of the report. They were more cautious about allowing AI to act as an independent expert in all cases. This pattern supports a differentiated model in which AI may assist both expert preparation and judicial review, while the highest level of caution applies where AI is proposed as a substitute for the human expert. Any combined use should

also be assessed for the risk that shared models or sources reproduce the same error rather than provide independent verification.

Some judges did, however, consider that limited forms of AI-based expert assessment may be possible in simple or highly structured cases, such as vehicle damage assessment (P7, P10 and P14). This view is important because it suggests that the appropriate level of assessment may depend on the type of technical task. Where the task is narrow, data-based, objective, and verifiable, AI may provide a stronger basis for controlled evaluation. Where the task requires complex professional judgment, contested scientific interpretation, or direct assessment of credibility or causation, reliance on AI alone becomes much more problematic (P1, P3, P4, P8, P11, P12, P13 and P14).

The interviews support the core distinction between AI as a judicial support tool and AI as a decision-making system. As one judge put it, the human element should not disappear, because "the judge remains the safety valve," especially in cases affecting people's rights and freedoms (P4).

The interviews also indicate that judicial acceptance would depend on institutional design. Some judges expressly linked acceptance to experimentation, feedback, training, technical strength, and regulation (P1, P3, P5, P12 and P13). More broadly, the interviews suggested that judges may accept AI where it demonstrates practical usefulness, but that it should not be introduced merely as an abstract technological idea. This is significant for the functional model because it confirms that the successful use of AI in Jordanian courts will depend not only on the choice of tools, but also on gradual testing, judicial training, and clear limits on permissible use.

8.6 Chapter Conclusion

This chapter examined the judicial tasks in which AI could provide practical support in Jordan without weakening judicial responsibility. Its most appropriate uses are those that help judges manage information, including fact extraction, document summarisation, legal research, preliminary drafting, and the review of expert reports. AI may be investigated as a source of preliminary organisational or analytical assistance within defined and validated workflows. Responsibility for determining the facts, assessing evidential weight, selecting and applying the law, and adopting the court's reasons remains with the judge. Similarly, AI may help identify weaknesses or inconsistencies in expert reports, but its output must remain transparent,

reviewable, and open to challenge. The interviews with Jordanian judges generally supported this limited approach. Judges recognised the potential benefits of AI but stressed the need for testing, training, regulation, and human control. The functional suitability of these applications, however, does not establish their practical feasibility in the Jordanian judiciary. Their implementation would also depend on technological infrastructure, financial resources, institutional capacity, legal rules, data governance, and judicial acceptance. The following chapter therefore examines the structural and institutional challenges that may affect the practical adoption of AI within the Jordanian judicial system.

9. Challenges to Implementing AI in Judicial Decision-Making in Jordan

The preceding chapters examined the risks associated with AI in judicial decision-making, developed a normative framework for assessing its use, and identified particular judicial functions in which AI may provide potential support in Jordan. Functional suitability, however, does not by itself establish practical feasibility. The implementation of AI within judicial institutions also depends on the technological, financial, institutional, professional, and legal conditions within which such systems would operate.

This chapter therefore examines selected implementation challenges that are particularly relevant to the Jordanian judicial context. It does not seek to provide an exhaustive account of every possible obstacle but focuses on those most closely connected to the practical adoption of the functions examined in Chapter Eight. The purpose is primarily diagnostic: proposed responses, governance mechanisms, and implementation priorities are developed in Chapter Ten as part of a broader strategy for the Jordanian judiciary.

Sections 9.1–9.4 draw in part on the author's co-authored published research on implementation challenges of judicial AI in Jordan, further expanded and adapted to the broader analytical framework of this dissertation.[469]

9.1 Technological, Data, Cybersecurity, and Financial Challenges

AI systems cannot be simply regarded as computer programs that can be easily installed and utilized. AI systems encompass advanced levels of both hardware and software technology. Implementing AI necessitates adequate hardware and software technologies to effectively develop, operate, and manage the systems. According to the Government AI Readiness Index 2024, the technology sector is one of three pillars for successfully implementing an AI system.[470]

Advanced AI systems require technological infrastructure, specialised expertise, and sustained institutional capacity that may be more readily available in countries with established experience in developing and deploying such technologies. By contrast, developing countries such as Jordan may face greater difficulties in developing advanced AI systems domestically because of limitations in technological capacity and specialised expertise.[471] Even where AI systems are acquired or adapted from abroad, domestic institutions may continue to depend on external support for their operation,

[469] Ammar Alqatawna, Zsolt Czekmann and Adrienn Nagy, 'Implementation Challenges of AI in Judicial Decision-Making in Jordan' (2026) 19(1) Law and Development Review 403–432, https://doi.org/10.1515/ldr-2025-0076.
[470] Fuentes Nettel et al. 2024.
[471] See Huynh 2024, p. 350.

maintenance, evaluation, and updating. Countries with limited domestic AI-development capacity may therefore need to rely, at least partly, on external technology providers, international partnerships, or adapted commercial systems. Such dependence may create additional concerns for judicial institutions relating to technological sovereignty, access to judicial data, system maintenance, transparency, and long-term institutional control.[472]

Many AI systems are developed by commercial entities whose design objectives, priorities, and constraints may not fully correspond to the requirements of adjudication. Publicly developed and openly licensed alternatives also exist, but reliance on external providers may still raise concerns relating to transparency, maintenance, and long-term institutional control.[473]

These concerns regarding external technological dependence are closely connected to the governance and protection of judicial data. In Jordan, the Personal Data Protection Law No. 24 of 2023 establishes the general principle that personal data should not be processed without prior consent, while Article 6 permits processing without such consent in certain circumstances, including where it is carried out by a competent public body for the performance of its legally assigned functions or by an entity contracted by that body.[474] This framework may therefore accommodate the processing of judicial data through AI systems operated either by public institutions or, subject to the statutory conditions, by external providers.

However, Article 7 also requires such processing to pursue a lawful and specific purpose, remain consistent with the purpose for which the data were collected, rely on accurate and up-to-date data, protect confidentiality and integrity, and avoid unjustified harm to the data subject. The practical challenge lies in ensuring that these safeguards can be effectively monitored where data processing is undertaken by external providers, particularly foreign technology companies. In such circumstances, questions may arise concerning access to judicial data, secondary use, compliance with the original purpose of processing, and the judiciary's ability to maintain effective institutional control over sensitive information.

Another technological challenge is that the operation of AI systems depends on the availability of sufficient quantities of appropriate and high-quality data. As discussed earlier, data constitute a fundamental component in the functioning of many AI systems.[475] Chen Mingtsung and Li Shuling observe that "The core of AI technology lies in the data that it relies on. If the data itself is incomplete, it will eventually produce incorrect results".[476] The effectiveness of AI outputs may therefore depend not only on the quantity of available data but also on their quality, relevance, and suitability for the

[472] Peluso Lopes 2025, pp. 52, 63; see also Martinho 2025.
[473] Sampaio, Seixas and Gomes 2019, pp. 18–19.
[474] Hashemite Kingdom of Jordan 2023, Personal Data Protection Law No. 24 of 2023, Art. 4-6.
[475] Fuentes Nettel et al. 2024.
[476] Chen and Li 2020, p. 4.

particular task. For some data-intensive applications, the required volume may extend beyond hundreds of documents to hundreds of thousands, although the amount required varies according to the system, task, and deployment approach.[477] In judicial contexts, the availability of sufficiently comprehensive and reliable judicial materials may therefore represent an important challenge, particularly where the proposed application depends heavily on domestic legal sources, judgments, reasoning, or case-related data. Experience from China has likewise shown that judicial AI projects may encounter difficulties in obtaining adequate data.[478]

The relevance of the data also depends on the function performed. Jordanian legal texts, interpretations, and judicial decisions are particularly important where the system is expected to address substantive questions of Jordanian law. Foreign judicial data, such as British or French materials, cannot therefore be assumed to substitute for appropriate Jordanian legal data for such tasks. They may nevertheless remain useful for certain technical, linguistic, comparative, or structural purposes that do not depend directly on the substantive content of Jordanian law. Accordingly, both the quantity and the jurisdictional and functional suitability of the data should be assessed in relation to the particular AI application under consideration.

In the context of judicial technology, the integration of AI may heighten existing cybersecurity concerns and introduce additional vulnerabilities. According to the EU Agency for Cybersecurity, different categories of threat actors may seek to harm AI systems through cyber means.[479] Cybercriminals, primarily motivated by financial gain, may use AI to facilitate attacks or exploit vulnerabilities in AI systems, for example by compromising AI-enabled chatbots to obtain sensitive data or by launching ransomware attacks against AI-based systems used in supply-chain management.[480] Insider threats may also arise from employees or contractors with authorised access, either through deliberate actions such as stealing or sabotaging datasets or through accidental corruption of data.[481] Nation-state and state-sponsored actors may present more sophisticated threats, including exploiting vulnerabilities in AI systems for strategic, disruptive, or intelligence-gathering purposes.[482] These risks are particularly relevant to the judiciary because courts themselves have increasingly become targets of malicious cyber activity, including ransomware and data theft.[483] What makes courts a desirable target is the sensitive data that courts manage. Information such as case details, witness accounts, evidence, and other related documents may be susceptible to theft and manipulation. The integration of AI in the judiciary may elevate the potential for cyberattacks, as these systems will have access to extensive data linked to the judicial system and all of its components, thereby rendering them more attractive targets for malicious

[477] Baker, Hobart and Mittelsteadt 2023, p. 28.
[478] Chen and Li 2020, p. 4.
[479] ENISA 2020, p. 24.
[480] ENISA 2020, p. 24.
[481] ENISA 2020, p. 24.
[482] ENISA 2020, p. 24.
[483] National Center for State Courts and State Justice Institute 2022, p. 1.

actors. Consequently, it is essential to tackle the issue of cybersecurity by enhancing the protective measures of AI systems against potential threats.

The financial challenge associated with adopting AI will also be a significant consideration. The development of AI from scratch entails significant financial investment.[484] The development of AI technology requires significant financial investment, with companies in this field allocating substantial resources to building and running AI systems. Therefore, implementing AI within the judiciary by governmental bodies or private enterprises requires adequate financial resources. Although some AI applications may generate long-term savings by reducing repetitive processing costs or improving the use of judicial resources,[485] such benefits cannot be assumed in advance. Development, procurement, secure infrastructure, integration, maintenance, updating, training, evaluation, and cybersecurity may all generate substantial continuing costs. The financial assessment should therefore consider the total lifecycle cost of a particular application rather than only its initial acquisition cost. The financial assessment should also be comparative. The relevant question is whether the lifecycle cost of a proposed AI use is justified relative to realistic alternatives addressing the same need, such as additional judicial staff, expanded technical offices, or investment in conventional legal research and case-management tools. High absolute cost does not by itself make AI unjustified, just as low cost does not establish that it is preferable.

Jordan, as a developing country, faces significant financial constraints that hinder many programs and projects aimed at developing the justice sector and court procedures. Official data from the JJC, the Jordanian Ministry of Justice, and the Jordanian Judicial Institute, set out in the Justice Sector Strategy in Jordan for 2022–2026, refer to a set of projects and plans for which financial resources and funding remain a challenge to implementation.[486] The annual reports issued by the JJC also consistently highlight financial constraints as one of the most important challenges the Council faces in achieving its vision and goals for developing the justice sector.[487] Although these documents do not establish the cost or feasibility of judicial AI, they provide relevant context concerning financial constraints affecting justice-sector development.

With regard to the technology sector, international indicators show that Jordan's institutional readiness to implement AI technologies is relatively good; however, the capabilities of the tech sector, along with infrastructure and data, still need to be strengthened through structured partnerships with global service providers and leading regional actors.[488] Official Jordanian sources, such as the National AI Strategy and the 2023–2027 Implementation Plan, also confirm that Jordan faces challenges and obstacles in

[484] Snyder 2022, p. 218.
[485] Chronowski, Kálmán and Szentgáli-Tóth 2021, p. 170.
[486] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022.
[487] Jordanian Judicial Council 2020; Jordanian Judicial Council 2021; Jordanian Judicial Council 2022; Jordanian Judicial Council 2023; Jordanian Judicial Council 2024.
[488] Fuentes Nettel et al. 2024.

executing strategic plans, including limited technological capacities and financial resources needed to build AI systems.[489] The purpose of citing these documents is to establish that Jordan faces both technological and financial challenges in implementing AI systems.

9.2 Institutional and Cultural Challenges

The introduction of new technologies frequently produces competing attitudes of acceptance, caution, and resistance. AI is no exception. The broader literature emphasises that technological development may generate substantial benefits while also creating risks that require institutional, legal, and social responses.[490] In the judicial context, however, the relevant cultural challenge is more specific: whether judges, court staff, legal professionals, and the public are willing to accept AI-assisted judicial functions and under what conditions.

In the context of judicial culture, the judiciary is an area where traditions and norms hold considerable importance. The courts possess a rich history of promoting judicial norms and conduct, with the judges serving as a central figure in this structure. From the terms judiciary and court, we can identify two different kinds of culture: judicial culture and court culture. The concept of judicial culture relates to the governmental branch tasked with administering justice. It encompasses various characteristics associated with the judiciary, including the hierarchical structure of the courts, the regulations governing the recruitment of judges, and the level of trust placed in the judiciary.[491] The court culture refers to the values and actions of those involved in resolving cases.[492] This encompasses case management, relationships among judicial staff, leadership within the courthouse, and internal organization. It also addresses the language utilized in court, the qualifications of judges, advocates, and court personnel, as well as the number of employees and judges present.[493] Additionally, it examines the integration of technology in court operations and the behaviour of judges, advocates, and staff in their interactions with clients.[494] The integration of AI within the judiciary may influence various facets of judicial and court cultures, depending on the level and depth of its adoption.

Firstly, the introduction of AI into the judiciary may significantly test public trust in the independence, neutrality, accuracy, and accountability of judicial decision-making. This issue is particularly important because decisions to adopt AI are usually taken by judicial or governmental authorities, often to address institutional pressures such as workload and efficiency. Although the public may benefit indirectly through faster proceedings, improved access to justice, and reduced human error, public concern is

[489] Ministry of Digital Economy and Entrepreneurship (Jordan) 2023.
[490] See Floridi 2014, p. 211; Karasinski, Candiotto and Vilaça 2024, p. 12.
[491] Kumar 2021, p. 174.
[492] Kumar 2021, p. 174.
[493] Kumar 2021, p. 174.
[494] Kumar 2021, pp. 174–175.

likely to increase when AI affects judicial discretion, legal reasoning, or case outcomes. Public attitudes should therefore form part of any assessment of judicial culture and institutional readiness.

Research on the use of technology in courts shows that acceptance is influenced by several interconnected factors. These include prior court experience, knowledge of legal technologies, age, trust in judicial institutions, and the general level of technological development within society.[495] For example, lawyers with court experience appear more willing to trust legal technologies than law students or individuals with limited practical exposure, partly because legal education may provide insufficient understanding of such tools.[496] Awareness may also shape the attitudes of younger people more strongly than those of older groups.[497] More importantly, support for legal technology may depend not only on trust in the technology itself, but also on existing confidence in courts.[498] Familiarity with digital systems in everyday life, together with their perceived usefulness and ease of use, may further encourage acceptance.[499] However, AI raises more specific concerns than ordinary court technologies. Studies on algorithmic adjudication suggest that people generally place greater trust in human judges and may be less willing to submit disputes to systems perceived as automated, even where such systems offer faster or cheaper procedures.[500] Public confidence also appears to depend partly on whether judges themselves are seen as understanding and exercising meaningful control over AI tools.[501] These concerns are strengthened by the limitations of current AI systems, particularly bias, opacity, and the limited interpretability of large language models. If AI-generated recommendations or reasoning cannot be adequately explained, challenged, or verified, their use may create perceptions of unfairness and weaken confidence in both the technology and the judiciary.[502] Accordingly, targeted empirical research is needed to examine public attitudes toward specific uses of AI in judicial decision-making. Such research should distinguish between low-risk administrative or supportive tools and more sensitive applications affecting legal reasoning, judicial discretion, and outcomes. It should also draw on the experiences of jurisdictions in which AI is already used in courts, while remaining sensitive to the legal and cultural context of Jordan.

Secondly, the judges play a crucial role in the process of AI integration. In what ways might judges engage with the results produced by AI systems? Is it necessary for judges to utilize AI systems for assistance? What types of support could AI offer to judges? What will be the effects of utilizing AI in litigation? It is essential to engage in extensive discussions with judges regarding these questions and others to determine the best approach to addressing the cultures of the judiciary and the courts.

[495] Barysė 2022, pp. 17–18.
[496] Barysė 2022, pp. 17–18.
[497] Barysė 2022, pp. 17–18.
[498] Barysė 2022, pp. 17–18.
[499] Barysė 2022, pp. 17–18.
[500] Yalcin et al. 2023, p. 284.
[501] Fine and Marsh 2024, p. 12.
[502] Lai et al. 2024, pp. 189, 192.

Understanding the needs, interests, and tasks of judges is essential for the successful integration of AI. Chen and Li report that the use and acceptance of AI technology among Chinese judges may vary with age, with its use being more concentrated among younger judges.[503] They further note that some judges may be reluctant to rely on AI in cases that require social experience and contextual judgment, preferring to exercise their own judgment rather than delegate such tasks to automated systems.[504] A study of judges' perspectives on AI indicates that judges are resistant to drastic changes in their profession and prefer incremental changes introduced by legal educators, policymakers, and technology developers, which may help them better adapt to the emerging Legal AI paradigm.[505] Judges are less open to changes affecting legal writing or their social and institutional role.[506] By contrast, they are more open to higher levels of automation in the earlier stages of judicial proceedings, while maintaining that assessing evidence, analysing arguments, and deciding cases should remain inherently human functions.[507] The study also shows that judges are concerned that AI may lead to what it describes as "Techno-Legal Positivism", where legal decision-making becomes increasingly reduced to or shaped by technological and algorithmic outputs at the expense of human legal interpretation and judgment. At the same time, judges acknowledge that legal AI technologies may have a positive impact on certain legal principles, provided that equal access, adequate cybersecurity, and meaningful judicial oversight are ensured.[508]

Jordan's Justice Sector Strategy 2022–2026 identifies several cultural and institutional barriers to digital transformation, including limited use of systems such as Mizan, uneven confidence in technology, resistance to change, and weak uptake of digital services.[509] Although the Strategy does not address AI directly, its introduction will similarly require awareness-raising, specialised training, clear safeguards, and small-scale pilots. This is consistent with the interviews in this study, where several judges linked acceptance to testing, feedback, training, and regulation (P1, P3, P5, P12 and P13), while broader stakeholder consultation remains necessary.

9.3 Judicial Training and Professional Development

The successful integration of AI into the Jordanian judiciary depends not only on technological infrastructure but also on the digital capabilities of judges and court personnel. AI-assisted judicial work requires users to understand the basic functioning, strengths, limitations, and appropriate uses of AI tools. Without such knowledge, there is a greater risk of inappropriate

[503] Chen and Li 2020, p. 4.
[504] Chen and Li 2020, pp. 4–5.
[505] Martinho 2025, section. 10.
[506] Martinho 2025, section. 10.
[507] Martinho 2025, section. 10.
[508] Martinho 2025, section. 10.
[509] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022, pp. 121–122.

reliance on AI-generated outputs, misunderstanding of system limitations, and ineffective use of available technologies. Educational challenges therefore extend beyond technical literacy to include developing the ability to critically evaluate AI-assisted outputs and to distinguish between functions that may appropriately be delegated to AI and those that must remain the responsibility of the judge.

Jordan faces this challenge because AI has not yet formed part of mainstream judicial education or continuing judicial professional development. Although judges possess extensive legal expertise, many have limited formal training in AI technologies and their implications for judicial work. Similar challenges affect court staff and, more broadly, legal professionals interacting with AI-assisted judicial processes. Accordingly, the educational challenge is not merely the acquisition of technical knowledge but the development of sufficient AI literacy to enable informed, responsible, and critical use of these systems.

The required level of AI literacy should also correspond to the function performed by the system. A judge using a source-linked retrieval tool does not require the same level of understanding as a judge reviewing AI-generated legal analysis, an automated evidentiary assessment, or an AI-assisted expert report. The educational challenge is therefore task specific. As the system moves closer to substantive judicial assessment, the need for specialised training, critical verification skills, and an understanding of system limitations becomes correspondingly greater.

9.4 The Legal Challenges

The extent of legal adaptation required depends on the function and legal effect of the proposed AI use. Three scenarios may be distinguished in descending order of their effect on adjudication: the transfer of adjudicative authority, assistive judicial functions, and administrative support. The first scenario is included solely to identify the constitutional boundary and is excluded as a policy option under the framework developed in Chapter Seven.

1. The integration of AI to replace judges in decision-making processes would likely require significant amendments to constitutional, legal, and regulatory frameworks. Such a shift could directly conflict with existing constitutional provisions that define the roles and responsibilities of judges and courts. Changing these foundational documents is a complex and lengthy process, often requiring extensive legal procedures and significant political or public support. In countries with stringent requirements for constitutional amendments, this could pose a considerable obstacle to the adoption of AI systems in the

judiciary. Furthermore, the reluctance or slow pace of constitutional reform in certain jurisdictions could hinder the seamless integration of AI technologies within the judicial system.

In Jordan, the Jordanian Constitution explicitly provides that the judiciary is independent and exercised by courts of all degrees, and that judgments are issued in accordance with the law in the name of the King (Articles 27). Read together with Articles 97 and 98, this provision strongly indicates that adjudicative authority is constitutionally vested in courts operating through legally appointed human judges. Accordingly, transferring binding adjudicative authority to an autonomous AI system would appear incompatible with the existing constitutional framework and would likely require fundamental constitutional and legislative reconsideration. Likewise, the laws governing judicial authority and organisation presuppose a human judge who is legally appointed and subject to guarantees of independence and accountability.

2. The integration of AI as an assistive tool for judges and court staff would likely necessitate amendments to laws governing various legal domains, particularly civil and criminal procedural laws. This expansive application of AI could involve tasks such as evidence analysis, witness statements, legal research, document review, and drafting. While AI could streamline these tasks, the final decision-making authority would remain with human judges. This distinction is crucial to ensure that AI serves as a supportive tool rather than replacing the human judgment essential in legal proceedings. Legal frameworks would need to be adapted to define the boundaries of AI's role and ensure that its use complements, rather than undermines, judicial independence and fairness. Consequently, substantial legal reforms would be required to accommodate these technological advancements, making the process of AI adoption in courts a complex and multifaceted challenge.

In Jordan, this model appears comparatively more feasible within the Jordanian legal framework, provided it is anchored in procedural legislation and supported by clear governance mechanisms. In this context, the integration of assistive AI tools would likely require amendments to the Codes of Civil and Criminal Procedure to clarify the permissible scope of AI usage in judicial functions such as legal research, evidence analysis, document review, and draft preparation, while preserving the judge's ultimate authority over fact-finding and decision-making. Also, the Law on Judicial Independence, which regulates judges' affairs and functions, also contains general provisions that affirm the constitutional principles of judicial independence and regulate judges' disciplinary accountability.[510] The law is likewise a reference for the Judicial Code of Conduct, which sets broad guidelines for judges' behaviour both in the performance of their duties and outside of them.[511] It may also be necessary for

[510] Hashemite Kingdom of Jordan 2014 (as amended), Law on the Independence of the Judiciary No. 29 of 2014, Art. 3.
[511] Hashemite Kingdom of Jordan 2014 (as amended), Law on the Independence of the Judiciary No. 29 of 2014, Art. 43.

this code to include rules governing judges' use of AI tools in Jordan, or for a comprehensive, standalone guide on the use of these tools to be issued.

3. The integration of AI systems in administrative tasks, such as AI-powered summarisation tools and electronic record management systems, will likely require amendments to lower-level regulations to facilitate their use. These AI applications primarily focus on automating storage and retrieval processes, which, while valuable, are distinct from the core judicial tasks performed by judges. As these systems fall outside the traditional scope of judicial decision-making, they may not be explicitly addressed in current legal frameworks. Consequently, changes to administrative or regulatory laws would be necessary to permit their implementation effectively. However, since these AI applications do not directly affect the judicial process or decision-making authority, the regulatory adjustments needed may be less complex compared to those required for AI in direct judicial functions.

In Jordan, introducing AI for administrative court functions can largely be implemented through ministerial instructions, procedural manuals, and technical regulations because these tools do not alter the core adjudicative power of judges. The Ministry of Justice already operates substantial digital infrastructure (e.g., the Mizan 3 case-management platform and an expanded e-services portal), which provides a platform for summarisation, indexing, records management, and scheduling, with outputs expressly treated as assistive and non-binding.[512]

Legal permissibility also depends on cross-cutting rules governing data processing and security, discussed in Section 9.1. These requirements are distinct from the separate question whether a particular AI function may lawfully influence adjudication.

Legal adaptation should therefore follow a clear, deliberate, and function-specific implementation strategy rather than precede the identification of the functions and conditions of use. These distinctions suggest that AI integration in Jordan would likely occur incrementally, particularly because different categories of AI applications require different levels of constitutional, legislative, and regulatory adaptation.

9.5 Chapter Conclusion

This chapter has shown that integrating AI into the Jordanian judiciary raises a range of practical challenges that cannot be reduced to technical issues alone. Drawing on theoretical discussion and Jordanian official and non-official sources, it identified financial and technological limitations, institutional readiness, professional and public acceptance, judicial education, and legal compatibility as the main factors that may affect successful adoption.

[512] Information and Communications Technology Association of Jordan (int@j) 2021.

These challenges are closely linked. Limited resources may affect the development, operation, maintenance, and evaluation of AI systems, while weaknesses in infrastructure and data may reduce their reliability. Acceptance is also important, since judges and the public are less likely to trust tools whose purpose, limits, and effects are unclear. Judges therefore need sufficient understanding of how these systems operate, what they can offer, and where their risks lie. The legal position will likewise depend on the task assigned to the system, its level of autonomy, and its effect on judicial discretion, responsibility, and procedural rights.

Overall, the closer AI comes to legal reasoning and decision-making, the more serious these challenges become. Its introduction should therefore be gradual, coordinated, and guided by clear priorities and safeguards. Building on the risks, possible uses, and practical challenges identified in this study, the next chapter sets out governance considerations and a phased approach for the evaluation, testing, and possible adoption of particular AI applications in the Jordanian judiciary.

10. A Proposed Governance Framework and Phased Approach for the Evaluation and Possible Adoption of AI in Judicial Decision-Making in Jordan

The preceding chapters have demonstrated that the possible use of AI in judicial decision-making cannot be treated as a purely technological question. In the judicial context, the evaluation and possible adoption of AI raise institutional, legal, ethical, technical, and cultural considerations that may directly affect the quality and legitimacy of adjudication. Any future introduction of AI into the Jordanian judiciary, where justified following a function-specific assessment, should therefore be approached as a gradual institutional process aimed at strengthening judicial capacity while preserving judicial independence, procedural fairness, reasoned adjudication, and clear human responsibility.

The findings of this dissertation show that Jordanian judges face significant pressures relating to caseload, judgment preparation, legal research, complex disputes, and expert evidence. Existing judicial reforms have made important contributions, but some challenges persist. This does not in itself establish that those reforms are ineffective, since continuing difficulties may reflect limitations in implementation, resources, continuity, scope, or practical reach. Their persistence nevertheless provides a basis for considering whether additional forms of support may be justified in particular judicial functions.

At the same time, the normative and empirical analysis identified important risks associated with judicial AI, including overreliance, inaccurate outputs, limited transparency, confidentiality concerns, and possible interference with independent judicial reasoning. Accordingly, this chapter does not recommend immediate or extensive AI adoption. Instead, it proposes governance guidance and a phased approach to the evaluation, testing, and possible adoption of particular applications where justified.

The chapter explains the rationale, principles, and institutional structure of the proposed governance framework. It then considers the main conditions for implementation, the level of assessment required for different AI uses, the distinction between assessment and deployment status, and a phased approach based on limited testing, evaluation, and continuing oversight. Throughout, AI is assessed alongside available institutional, human, procedural, and conventional digital responses rather than in isolation.

10.1 Rationale, Vision, and Strategic Objectives of the Proposed Framework

The rationale for a specialised governance framework for judicial AI adoption in Jordan arises from the combined findings of this dissertation. The Jordanian judiciary faces institutional pressures that affect the time, information, and support available for judicial decision-making. Although AI may assist with some of these pressures, its introduction may also create new risks if its purpose, limits, and institutional control are not clearly defined. The central question is therefore not whether the judiciary should adopt

AI as a general objective, but whether particular tools can respond to identified judicial needs while remaining consistent with the essential guarantees of adjudication.

For this reason, the evaluation of AI tools should begin with the judicial problem to be addressed, not with the availability of a particular technology. This approach is supported by the principles of technological neutrality and the subsidiarity of AI reflected in the 2025 CEPEJ Guidelines on the Use of Generative Artificial Intelligence for Courts. As the Guidelines state, judicial institutions should "start with identifying the problem, not the technical solution".[513] A functional need should first be defined, after which AI-based responses should be considered alongside realistic institutional, human, procedural, and conventional digital alternatives.[514] The purpose of this assessment is not to require AI to demonstrate abstract superiority over every possible alternative, but to determine whether a particular application provides sufficient additional value in the circumstances, having regard to its expected benefits, risks, safeguards, resource requirements, and available alternatives.

This needs-based approach also requires AI to be considered in relation to existing forms of judicial support and reform. Procedural measures, judicial specialisation, training, technical offices, legal databases, additional human support, and AI may each respond to different aspects of the same judicial need. The appropriate institutional response may therefore involve improving an existing measure, supplementing it with another form of support, combining different responses, or deciding that AI is not justified in the particular context. No technological or conventional response should be presumed preferable in advance.

This comparative and needs-based approach can also be situated within Jordan's existing policy framework. The proposed governance framework would not begin in a policy vacuum. Jordan has already adopted the Jordanian AI Policy 2020 and the Jordanian AI Strategy and Implementation Plan 2023–2027, which establish a general national direction for AI adoption, capacity building, regulatory development, and improved public-sector performance.[515] The Jordanian Digital Transformation Strategy and Implementation Plan 2026–2028 further emphasises digital infrastructure, data governance, cybersecurity, and institutional readiness.[516] In the justice sector, the Report of the Royal Committee for Developing the Judiciary and Enhancing the Rule of Law and the Justice Sector Strategy 2022–2026 support judicial independence, institutional development, professional training, procedural modernisation, and the use of technology to improve the administration of justice.[517]

[513] CEPEJ 2025, Guidelines on the Use of Generative Artificial Intelligence for Courts, paras. 13–15.
[514] CEPEJ 2025, Guidelines on the Use of Generative Artificial Intelligence for Courts, paras. 13–15.
[515] Ministry of Digital Economy and Entrepreneurship (Jordan) 2020; Ministry of Digital Economy and Entrepreneurship (Jordan) 2023.
[516] Ministry of Digital Economy and Entrepreneurship (Jordan) 2026.
[517] Royal Committee for Developing the Judiciary and Enhancing the Rule of Law 2017; Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022.

These national and sectoral frameworks provide an important policy and technical foundation for judicial AI adoption, including wider investments in infrastructure, cybersecurity, digital skills, and public-sector innovation. However, their objectives remain general. They do not determine which judicial functions may appropriately be supported by AI, how different applications should be classified according to risk, what degree of judicial oversight is required, or how systems operating close to evidence assessment and legal reasoning should be approved and monitored. The proposed framework does not seek to replace these policies, but to translate their general objectives into a specialised model that reflects judicial independence, fair-trial guarantees, confidentiality, accountability, and the judge's duty to produce an independent, reasoned, and reviewable decision.

The vision underlying the framework is a Jordanian judiciary in which carefully selected AI tools may be used, where justified, to improve access to reliable information and reduce avoidable informational burdens, while judges retain effective control over the assessment of facts, interpretation of law, legal reasoning, and the final decision. AI should strengthen the conditions in which judicial judgment is exercised, rather than redistribute judicial authority, standardise decisions at the expense of the individual case, or reduce human involvement to formal approval.

To realise this vision, the framework pursues four connected objectives. First, every proposed use of AI should respond to a clearly defined judicial need and be assessed alongside realistic, less complex, or less risky alternatives. Second, institutional responsibility should be clearly allocated for the assessment, and approval of any judicial AI system that may be adopted. Third, the technical, financial, regulatory, and human capacity required for secure and sustainable use should be identified and developed where institutional adoption is justified. Fourth, any movement from evaluation to piloting, and from piloting to wider use, should depend on practical evidence concerning accuracy, verifiability, judicial usefulness, behavioural effects, and consistency with judicial values.

The framework developed in this chapter does not determine that any particular AI application should be adopted in Jordan, nor does it constitute an official national strategy. Rather, it translates the findings of the dissertation into governance guidance and a phased evaluative approach that may inform future use-specific institutional assessment and the development of a national strategy. Decisions concerning the institutional adoption of particular applications would require further assessment in their actual judicial and institutional context, including their benefits, risks, safeguards, existing responses, realistic alternatives, and the conditions necessary for effective judicial control.

10.2 Foundational Principles for the Evaluation and Possible Adoption of Judicial AI

Building on the normative framework developed in Chapter Seven, the principles in this section translate those normative requirements into practical governance and implementation conditions for the

future assessment, testing, and possible adoption of judicial AI. The relationship is therefore sequential rather than repetitive: Chapter Seven identifies what must be protected and assessed, while this chapter considers how those requirements may be reflected in institutional responsibilities, testing, approval, monitoring, and withdrawal.

The adoption of AI in the judiciary cannot be assessed solely by reference to technological capability or efficiency. It must remain consistent with the constitutional and institutional values underlying adjudication. The principles developed below are therefore intended not merely as ethical guidance, but as practical requirements to be reflected in system selection and design, procurement, training, pilot projects, monitoring, and the allocation of institutional responsibilities.

10.2.1 Judge-Centred AI, Meaningful Human Oversight, and Judicial Responsibility

Any institutional use of AI within the judiciary should be governed by the principle that the judge remains at the centre of judicial decision-making. Where AI is adopted for a justified judicial function, it should strengthen the judge's ability to perform judicial duties rather than redistribute judicial authority between the judge and the technological system or reduce the judicial role to approving the conclusions.[518] What matters is not merely the continued presence of a judge, but whether the judge retains effective control over the legally significant stages of the decision.

Functions forming the core of adjudication must remain under the judge's independent authority. These include determining the legally relevant facts and arguments, evaluating evidence, interpreting and applying the law, constructing judicial reasoning, and reaching the final outcome. AI may provide preparatory, informational, or limited drafting assistance, but it should not determine what the judge must accept as factually or legally correct. Nor should its output acquire practical authority merely because it is expressed in fluent or persuasive language.

Meaningful human oversight therefore requires more than a signature or formal approval at the end of the process. The judge must remain able to understand the purpose and principal limitations of the tool, return to the original materials, verify the basis of its output, and modify or reject it without technical or institutional pressure. However, this case-specific duty should be distinguished from responsibility for the broader oversight of the system. As Banks observes, "the task of overseeing high-risk judicial decision support systems is too big for judges-in-the-loop alone", since risks arising from design, data,

[518] Banks Banks similarly argues that judges using AI decision-support systems must retain the professional authority and autonomy to diverge from AI outputs, warning against arrangements that may encourage judges to "rubber-stamp" such outputs, See: Banks 2026, pp. 22.

cybersecurity, updates, and institutional arrangements require structural safeguards beyond the individual case.[519]

Oversight should also be designed so that it does not require the judge to repeat the entire task performed by the system. Otherwise, the review process may consume the practical benefit that justified AI adoption. AI outputs must remain non-binding. Consistent with the 2025 CEPEJ Guidelines, judges should not be compelled to use AI recommendations or required to provide special justification for departing from them.[520] They should likewise not be evaluated according to how frequently they accept automated suggestions. Efficiency gains should not automatically lead to higher case-completion targets or reduced time for deliberation, as this may transform a support tool into a source of pressure and encourage uncritical reliance. Verification must address both incorrect material that appears in an output and legally significant material that may have been omitted. Source links can facilitate verification of what is present, but they do not by themselves reveal missing authority, evidence, or qualifications. The practical effectiveness of oversight therefore depends on the judge having sufficient access, competence, time, and authority to identify and correct material errors or omissions, matters that should themselves be examined during testing.

Judges should also participate in defining the purpose, permissible scope, and practical design of judicial AI tools from an early stage.[521] Judicial participation, however, should complement rather than replace independent technical, legal, cybersecurity, and ethical assessment. The use of AI does not remove the judge's professional responsibility for exercising independent judgment or for the decision ultimately issued.[522] A system error cannot justify reliance on an output that should reasonably have been verified. However, this responsibility should not be interpreted as transferring all consequences of technological failure to the individual judge. Harm may also result from inadequate institutional testing, defective design, unreliable data, undisclosed updates, or a provider's failure to communicate known limitations.

Human involvement should not be treated as a legal basis for shifting responsibility for AI system failures to the judge, particularly where the judge lacked the information, expertise, or practical capacity necessary to detect the relevant defect. Nor should the presence of a human decision-maker operate to insulate institutions or technology developers from responsibility for failures attributable to system design, development, or operation.[523]

[519] Banks 2026, pp. 22–23. Banks further argues that reliance exclusively on a judges-in-the-loop model is unlikely to ensure effective oversight.
[520] CEPEJ 2025, paras. 57–58.
[521] Liu and Li 2024, p. 238; Banks 2026, pp. 19–20.
[522] CEPEJ 2025, paras. 56–57.
[523] Paar 2025, p. 1387. Paar observes that keeping a human "in the loop" may, in some circumstances, serve less as a substantive safeguard for persons affected by AI and more as a means of attributing the system's conduct to a human actor and protecting developers from liability.

10.2.2 Necessity, Proportionality, Risk Classification, and Gradual Evaluation and Deployment

Every proposed use of AI within the judiciary should be subject to a structured, use-specific assessment before development, procurement, or institutional adoption begins. This assessment should address four connected questions: whether the judicial problem is sufficiently clear, whether the proposed AI use provides sufficient additional value when considered alongside realistic alternatives, what level and type of risk arise from the proposed function, and whether the judiciary possesses the institutional capacity to test, supervise, and, if justified, operate the tool safely. Approval should not be based on the general capabilities of a system or on broad claims that AI will improve efficiency across judicial work.[524]

The assessment of necessity should begin with a defined operational problem and an identifiable baseline. The responsible institution should be able to explain how the task is currently performed, where the principal difficulty arises, and what improvement the proposed tool is expected to achieve. It should also consider whether the problem could be addressed through procedural reform, better access to information, additional staff, improved databases, or a conventional digital system. The assessment should justify the choice of AI, alone or alongside existing support, by reference to its expected additional value, risks, and resource requirements in the relevant institutional setting.[525]

The proportionality assessment should then examine whether the expected additional value of the proposed use is sufficient to justify the risks, safeguards, institutional requirements, and resources associated with it. The relevant inquiry is not a general comparison between human and technological decision-making, nor an attempt to establish that AI is superior to existing forms of support. In this study, this requires a use-specific assessment of the proposed AI-supported process in its actual institutional context, including comparison with realistic human, procedural, institutional, and conventional digital alternatives. This approach is consistent with the Council of Europe's requirement that AI risk-management measures be graduated and differentiated according to the context and intended use of the system and the severity and probability of potential impacts.[526]

Risk classification should attach to the specific function and context of use, rather than to the technical system in the abstract. The same model may present a relatively limited risk when used with public and non-sensitive materials, but a substantially greater risk when applied to confidential case files or information capable of influencing judicial reasoning. Approval should therefore identify the precise task, users, data, categories of cases, and permitted outputs. A system should not receive a general

[524] CEPEJ 2025, pp. 13–15; see also National Institute of Standards and Technology 2023, pp. 25–27, 32 (MAP 1.1, MAP 2.1–2.2, MAP 3.1–3.5, MAP 5.1 and MANAGE 1.1).
[525] CEPEJ 2025, pp. 13–15.
[526] Council of Europe 2024, Art. 16(1)– (2), especially Art. 16(2)(a), (b), (e) and (g).

authorisation that allows it to move unnoticed from an approved support function into more sensitive forms of use.

The intensity of assessment should increase as the proposed use moves closer to evidence assessment, legal reasoning, or the determination of an outcome. Uses falling within baseline assessment may require standard legal, technical, security, and monitoring checks, while uses requiring enhanced assessment should be supported by stronger evidence, more demanding safeguards, direct access to relevant sources, specialised training, and more limited testing. Uses that transfer judicial authority to the system, make meaningful review impracticable, or create risks that cannot be adequately controlled remain excluded under the present framework.

Gradual deployment should give practical effect to this risk-based approach. Judicial AI should therefore proceed through limited testing, evidence-based evaluation, and continuing reassessment, with expansion depending on demonstrated performance and the continued effectiveness of the relevant safeguards.[527] The operational stages and evaluation criteria for this process are developed in Section 10.4.

Necessity, proportionality, risk classification, and gradual deployment should thus operate as a continuing decision process rather than as separate abstract principles. Together, they ensure that judicial AI is introduced only for a defined purpose, under safeguards proportionate to its actual use, and expanded only where practical evidence justifies the next stage.

10.2.3 Transparency, Traceability, and Procedural Contestability

Transparency in judicial AI does not necessarily require every judge or party to understand the system's mathematical architecture or source code. It requires sufficient knowledge of the tool's purpose, operation, limitations, data sources, and role in the judicial process to permit informed use, institutional supervision, and, where necessary, challenge by the parties.[528]

Judges should be informed of the type of system they are using, the functions for which it has been approved, the relevant categories of training or reference data, the sources accessed in producing its outputs, and the limitations identified through testing. A general-purpose commercial system should not be presented as a specialised legal tool, nor should a system be used in categories of cases or legal fields for which it has not been evaluated.[529]

Outputs should be traceable to authoritative sources wherever the nature of the function permits. Where a system identifies a fact, legal provision, judicial decision, or statement contained in a case file, the user should be able to return directly to the original material. A linguistically convincing response that

[527] CEPEJ 2025, paras. 33–34.
[528] National Institute of Standards and Technology 2023, pp. 15–16; see also CCJE 2023, paras. 59, 92.
[529] CEPEJ 2025, paras 27–35, 65 and 75.

does not reveal its evidential or legal basis cannot be reviewed effectively and presents an increased risk of error.[530]

The system should also distinguish clearly between reproduced source material and generated content, and between information verified against an identified source and an inference, synthesis, or recommendation produced by the model. Where an assertion cannot be verified against an official legal source or the case file, the system should indicate that limitation rather than present the assertion as established fact. In legal research, particular importance should be attached to citation validation and the use of official or otherwise authoritative databases.[531]

Traceability additionally requires adequate records of system use. Depending on the sensitivity of the function, such records may include the system and version used, the time and type of operation, relevant updates, and recorded errors or incidents. Where lawful and necessary for the function concerned, additional information may also be retained to enable the reconstruction and review of the system's operation. Such records can support incident investigation, help determine whether an error is associated with a particular system version or operational condition, and facilitate continuing evaluation of the tool's performance and suitability.[532]

Records should not, however, become a means of reconstructing, evaluating, or monitoring the substance of judicial deliberation. They should not be used to determine whether a judge followed the system's recommendation or to measure judicial performance by reference to automated outputs.[533]

A distinction should be maintained between internal institutional transparency and disclosure to the parties. Internal transparency requires the competent judicial and technical bodies to understand and audit the system sufficiently to approve and supervise its operation. Transparency towards the parties becomes particularly important where AI use has materially affected evidence assessment, a procedural determination, the organisation of judicial reasoning, or another matter capable of challenge.

This does not mean that every routine use of a spelling, document-formatting, or purely administrative organisation tool must necessarily be disclosed. The required level of disclosure should correspond to the nature and significance of the system's influence. Where an AI system has substantially informed a determination affecting the parties' rights, the affected parties should be informed of the relevant role of the system, receive sufficient information to understand and effectively challenge its contribution to the decision, and have access to effective human review by a person or body with authority to address any adverse effect.[534]

[530] CEPEJ 2025, paras 32, 47, 51, 53–54 and 74.
[531] CEPEJ 2025, paras 32, 53–54 and 74.
[532] European Union 2024, Regulation (EU) 2024/1689, Arts. 12, 19, 26(6), 72–73; Annex IV.
[533] CEPEJ 2025, paras 57–60.
[534] Council of Europe 2024, art 14(2)(a)–(c) and art 15; European Union 2024, Regulation (EU) 2024/1689, Art. 86.

Commercial confidentiality and intellectual property should not prevent effective institutional scrutiny. Public disclosure of every technical component may be unnecessary, but a provider should not be permitted to withhold information required to assess accuracy, data practices, security, system updates, or known limitations. A tool that cannot be independently examined to the degree required by its judicial function should not be used in the adjudication.

Transparency must also be practical rather than theoretical. Providing extensive technical documentation does not achieve meaningful transparency if judges cannot use it to verify an output in the time available. Systems should therefore present their results in a form that supports realistic human review, directs the user to the relevant sources, and identifies uncertainty or disagreement where appropriate.[535]

10.2.4 Judicial Control, Data Governance, and Cybersecurity

AI tools processing judicial information or operating close to judicial decision-making should remain under effective Jordanian institutional and judicial control. This requirement is connected not only to data protection, but also to judicial independence, institutional autonomy, and the integrity of legal proceedings.[536] In this context, it has been argued that, "ideally, the development of AI tools for use in judicial settings should shift from outsourcing to private companies toward state-built or non-profit models."[537] Although cooperation with private technology providers may remain necessary, particularly where specialised technical expertise is required, the design and deployment of judicial AI should not place essential judicial functions or sensitive data beyond effective public oversight.

Judicial data may include personal, financial, medical, family, commercial, and security-related information, together with evidence, expert reports, unpublished judgments, and confidential procedural documents. Entering such information into general commercial platforms may result in loss of control over where the data are processed, who may access them, how long they are retained, and whether they are reused to train external models. The use of public or unauthorised AI tools for case-related data should therefore be prohibited.[538]

Effective judicial control does not necessarily require every technical component or underlying model to be developed within Jordan. Cooperation with domestic universities, research centres, foreign experts, or commercial providers may be necessary because of cost and technical complexity. The relevant requirement is that the competent Jordanian institutions retain control over the purpose of the system, the data processed, access to the information and documentation required for effective

[535] National Institute of Standards and Technology 2023, sections 3.4–3.5, pp. 15–16.
[536] CCJE 2023, paras 56–58, 62–63.
[537] Lopes 2025, p. 63.
[538] CEPEJ 2025, paras 27–30.

supervision, user permissions, significant updates, auditing arrangements, and decisions concerning continuation, suspension, or replacement.[539]

Preference should be given to tools adapted to Jordanian legislation, judicial decisions, legal terminology, Arabic language, and local procedural practices. This may be achieved through nationally developed models, task-specific models of an appropriate scale, secure adaptation of existing models, or systems connected to curated Jordanian legal databases. The appropriate solution should depend on the task, required accuracy, security, cost, and available infrastructure rather than an assumption that the largest or most technically advanced model is necessarily preferable.[540]

Clear rules should also govern custody, control, access rights, and responsibilities throughout the data life cycle. These rules should identify who controls the data entered into the system, the status of generated outputs, the applicable retention period, the persons entitled to access them, and the procedures for secure deletion. Judicial institutions should retain the ability to retrieve and transfer their data in formats that do not depend exclusively on the provider.[541]

National hosting alone does not guarantee effective institutional or judicial control. A system may operate on domestic infrastructure while remaining dependent on an external provider for its functioning or updates. Effective control therefore requires institutional capacity to understand the relevant characteristics of the system, investigate errors, supervise access, audit performance, and suspend its operation where necessary.[542]

Data governance and cybersecurity are therefore not merely technical support measures. They are institutional safeguards intended to prevent judicial information and functions from becoming subject to external commercial interests, unauthorised access, or technological decisions that the judicial authority cannot supervise.

10.2.5 Operational Continuity, Reversibility, and System Substitutability

The adoption of AI should not make the continued operation of the courts materially dependent on the uninterrupted availability of a particular system, provider, or technological infrastructure. Even a tool limited to legal research, document summarisation, or information extraction may become embedded in daily judicial work. If it later becomes unavailable, substantial reliance on it may disrupt court operations and delay cases.[543]

[539] CCJE 2023, paras. 57–58.
[540] CEPEJ 2025, paras, 13–16, 29–32.
[541] Hashemite Kingdom of Jordan 2023, Personal Data Protection Law No. 24 of 2023, Arts. 7, 11–14.
[542] National Institute of Standards and Technology 2023, MEASURE 1.2, 2.3–2.9 and 3.1; MANAGE 2.4 and 4.1–4.3.
[543] CEPEJ 2025, paras. 34–35, 67.

Systems may become unavailable because of technical or cyber incidents, loss of connectivity, contractual or provider failure, withdrawal of support, or an institutional decision to suspend their operation after serious defects or risks are identified. Continuity planning should therefore form part of the approval process rather than be considered only after an incident occurs.[544]

Each system intended for regular judicial use should have a proportionate contingency plan. The plan should identify the alternative procedures to be followed. Courts should remain capable of performing essential functions during the interruption, even if at a temporarily lower level of efficiency.

Judicial data and documents should be backed up in secure and accessible formats outside the exclusive control of the provider. Data portability should permit judicial data and associated records to be transferred to another approved system in a structured and usable format, without substantial loss of information, accessibility, or essential operational capability. Procurement and development decisions should therefore avoid unnecessary technological lock-in.[545]

Reversibility also has a human dimension. Long-term reliance on automated research, organisation, or drafting tools may gradually weaken the professional ability to perform those functions independently. Training in AI-assisted work should therefore remain connected to traditional legal sources and methods. Judges and court staff should retain the essential skills required to continue work when a system is unavailable or unsuitable for a particular case.[546]

A system should consequently be assessed not only according to its performance while it is operating, but also according to the judiciary's capacity to function in its absence. Operational continuity, data portability, reversibility, and system substitutability should be conditions for approving any AI tool intended to become a regular part of judicial work.

10.3 Institutional Structure

The institutional use of judicial AI requires clear allocation of responsibilities, decision-making authority, and oversight mechanisms because of the interaction between judicial, technical, and regulatory considerations. Functional or technical suitability alone is therefore insufficient; it must also be clear who is responsible for evaluating, approving, implementing, and monitoring a system, and how the relevant institutional roles can operate together without affecting judicial independence. The allocation set out below is a governance proposal rather than a statement of existing statutory powers. Its implementation would require confirmation of the legal competence of each institution and, where necessary, an appropriate legal or regulatory basis.

[544] European Union 2023, Regulation (EU) 2023/2854, Arts. 23–30.
[545] CEPEJ 2025, para. 67.
[546] Rinta-Kahila et al. 2023, pp. 1378–1379, 1408; see also CEPEJ 2025, paras 42, 44–48 and 77.

10.3.1 The Judicial Council

The Judicial Council occupies the central position in the proposed structure because AI systems used in or near judicial decision-making affect the exercise of judicial authority rather than court administration alone. The Council already stands at the head of the regular judiciary and performs a central role in judicial policy and the development of judicial work.[547] Its leadership of the strategy would ensure that decisions concerning AI remain grounded in judicial needs and values rather than being determined primarily by procurement opportunities or technological availability.

The Council's principal function would be to establish the judicial boundaries of AI use. It would define the categories of functions that may be supported, determine the required intensity of assessment, and decide separately whether a particular use has sufficient evidence to proceed to testing or limited deployment. Technical development and evaluation may be delegated to other bodies, but the decision that a particular function is compatible with adjudication remains judicial in nature. This policy role also includes the adoption of a general framework for professional conduct. A concise provision concerning responsible AI use could be incorporated into the Jordanian Judicial Code of Conduct, while a separate and more detailed guide would regulate approved tools, confidentiality, verification, documentation, and error reporting.[548] Separating the two instruments would preserve the general character of the Code while allowing the detailed guidance to be updated as technologies and approved uses change. The Council should also be granted the authority to approve pilot projects, authorise expansion, and suspend systems where their performance or use no longer satisfies the conditions of approval. Judicial inspection may support this framework by supervising compliance with approved conditions of use, including the use of authorised systems, protection of confidential information, completion of required training, and reporting of significant errors. It should not examine whether a judge accepted or rejected an AI output, use departure rates as a measure of judicial performance, or reconstruct the substance of judicial deliberation. This supervisory role was also proposed by one participant (P3).

10.3.2 The Ministry of Justice

The Ministry of Justice represents the operational and technical component of the proposed structure, reflecting its existing role in providing administrative, technological, and infrastructural support to the courts.[549] More broadly, its role would be to establish the operational environment necessary for the secure and sustainable institutional use of AI, including the development of digital infrastructure and

[547] Hashemite Kingdom of Jordan 2014 (as amended), Law on the Independence of the Judiciary No. 29 of 2014.
[548] Hashemite Kingdom of Jordan 2014 (as amended), Law on the Independence of the Judiciary No. 29 of 2014, Art. 43.
[549] Jordanian Judicial Council, Ministry of Justice (Jordan) and Jordanian Judicial Institute 2022.

data, integration with existing judicial systems, and the provision of the resources and technical support required for their operation.

The Ministry would also play a central role in managing the contractual and technical dimensions of systems throughout their life cycle. Procurement and contracting should therefore address total cost, cybersecurity, data governance, maintenance and updating, auditability, data portability, and system replacement where necessary. Contracts should also ensure that the competent Jordanian institutions retain effective control over judicial data and the conditions of its use, while avoiding unnecessary dependence on external providers.

The Ministry's existing technical capacity also provides a foundation for gradually developing national capacity in judicial AI, including system evaluation and testing, oversight of external providers, and participation in designing and adapting solutions to Jordanian judicial needs, with the longer-term possibility, where capacity permits, of contributing to nationally controlled solutions.[550]

10.3.3 The Judicial Institute of Jordan

The Judicial Institute provides the capacity-building component of the framework. It is the official institution responsible for preparing candidates for judicial office and for the continuing professional training of judges.[551] This institutional connection allows AI training to be integrated into judicial policy rather than treated as an external technical exercise.

Training would combine a common foundation with instruction linked to each approved tool. The general component would address how different AI systems produce outputs, the significance of data quality, common forms of error, confidentiality, and the behavioural risks of fluent or persuasive recommendations. Tool-specific instruction would focus on the function actually performed, the sources available for verification, the limits established by the approval decision.

Practical exercises would form an important part of this training. Judges and court staff could be presented with inaccurate citations, incomplete summaries, distorted factual extraction, or confident outputs unsupported by the original documents. The aim would not be to turn judges into programmers, but to enable them to ask informed questions and recognise when an output cannot safely be used. This approach is reflected in the Federal Judicial Center's guide for federal judges, which focuses on the concepts and questions judges need in order to evaluate AI without requiring technical expertise in coding or mathematics.[552]

Access to uses requiring enhanced assessment should be linked to completion of the relevant training and demonstration of basic competence in verification and error handling. Training would continue

[550] Hashemite Kingdom of Jordan 2022, Administrative Organization Regulation of the Ministry of Justice No. 2 of 2022, Art. 3.
[551] Hashemite Kingdom of Jordan 2020, Jordanian Judicial Institute Regulation No. 49 of 2020, Art. 3.
[552] Baker, Hobart and Mittelsteadt 2023, pp. 5–6, 82–83.

after deployment, since updates in the tool, new forms of synthetic evidence, and experience gained during pilots may change what users need to know.

The Institute would also provide a channel through which judicial experience is collected and returned to the governance process. Feedback from judges, studies of actual use, and cooperation with Jordanian universities and technical researchers would help develop knowledge grounded in the Arabic language, Jordanian law, and local judicial practice.

10.3.4 Specialised Body for Judicial AI Governance and Technical Oversight

The governance framework could be supported by a specialised multidisciplinary body operating under the Judicial Council and bringing together the judicial, legal, and technical expertise required to assess judicial AI. Its principal role would be to support the evaluation of proposed applications in terms of need, risk, safeguards, and institutional readiness, and to contribute to the continuing review of their performance following testing or implementation. This would provide a structured professional basis for the Judicial Council's decisions.

The body could also coordinate independent technical and cybersecurity assessment and, where appropriate, draw on relevant national authorities, including the National Cyber Security Centre.[553] This model would bring different forms of expertise into the governance process while leaving questions of judicial acceptability and final authority with the competent judicial institutions.

10.4 Evidence-Based Phased Implementation Roadmap

The proposed roadmap translates the preceding governance principles into a phased process for evaluating and testing judicial AI applications before any wider institutional use. Progress between stages should depend on institutional readiness and evidence generated through assessment and piloting, rather than on a fixed timetable.

10.4.1 Evidence Building and Readiness

The first stage should translate the judicial needs and functional areas identified in this study into specific and assessable institutional use cases. The dissertation has established the existence and practical relevance of a number of workload and judgment-quality challenges, but further institution-specific statistical and qualitative research would be required to determine their scale, distribution, variation across courts and legal fields, and the current baseline against which a proposed intervention should be assessed. Relevant evidence may include caseload and file-complexity data, the time

[553] Hashemite Kingdom of Jordan 2019, Cyber Security Law No. 16 of 2019.

associated with research, judgment preparation, and expert evidence, and differences between courts in resources, working practices, and existing forms of support.

This evidence should not be drawn from judges alone. Broader surveys, interviews, or focused consultations with judicial staff, lawyers, experts, court users, and members of the public may reveal procedural effects, access difficulties, or concerns about legitimacy that are less visible from within the judiciary. Their participation would not give external actors authority over judicial functions; it would provide a more complete account of the environments in which the proposed systems would operate.

The next stage of analysis should be organised around specific use cases rather than AI adoption in general. For each proposed function, the responsible institutions should identify the judicial need, the existing process and forms of support, the realistic non-AI alternatives, the expected additional value of the proposed application, the relevant risks and safeguards, and the institutional capacity needed to test and supervise the tool. This analysis may lead to the selection of a limited use for controlled testing, to the improvement or supplementation of an existing response, or to the conclusion that a procedural, staffing, institutional, or conventional digital measure provides a more appropriate response.

10.4.2 Controlled Piloting and Evaluation

Where the preceding assessment provides a justified basis for testing a particular AI use, it should then be examined within a limited and controlled setting defined by its function, users, participating courts, data, and duration. The pilot should compare the AI-supported process with the relevant existing process and realistic alternatives where appropriate, rather than merely demonstrate that the system is technically capable of generating an output. Its design should follow the judicial problem, use case, and baseline identified in the preceding stage.[554]

Evaluation should concentrate on evidence capable of informing an institutional decision: accuracy and completeness, the seriousness and detectability of errors, traceability to original sources, and the net time saved after verification and correction. It should also examine whether the system alters work practices, encourages excessive reliance, or creates effects on lawyers or court users that are not reflected in technical performance figures.[555]

Each pilot should conclude with a formal decision to expand the use within defined limits, continue testing with modifications, restrict its function, or discontinue it. Completion of a pilot and investment in its development should not create a presumption in favour of continuation.

[554] CEPEJ 2025, paras 13–16. See also, Raji et al. 2020, pp. 38–40.
[555] CEPEJ 2025, paras 34, 46–47, 51, 53–54 and 77, n 41.

10.4.3 Conditional Integration and Continuing Review

Expansion should remain limited to the function and context that were evaluated. Success in one court, legal field, or task does not establish that the same system is appropriate for different data, users, or purposes. A move from information support to drafting or analytical assistance would therefore require a separate justification and pilot, even where the same underlying model is used.[556]

Integration into ordinary judicial work should remain conditional on continuing value and institutional control. Material changes to the model or authorised function should trigger renewed assessment. Periodic studies should also examine longer-term effects on judicial skills, verification practices, patterns of reliance, differences among courts, and professional or public confidence where the system affects external services.[557]

The result is a continuing cycle rather than a linear movement towards wider adoption. Research determines whether intervention is justified; piloting determines whether the proposed use works in practice; and subsequent evidence determines whether it should be maintained, modified, expanded, or suspended. In this way, implementation remains connected to the actual needs identified by the study rather than to an assumption that technological expansion is itself the objective.

This phased approach should not be interpreted as creating a presumption that every identified judicial problem will ultimately require an AI-based response, or that successful testing should necessarily lead to wider adoption. At each stage, AI should remain under consideration alongside realistic human, procedural, institutional, and conventional digital alternatives. Where an existing response can be improved, or where a comparable or more appropriate benefit can be achieved through a less risky or less resource-intensive measure, the justification for adopting AI becomes correspondingly weaker. The objective of the framework is therefore not to maximise the use of AI, but to identify the most appropriate form or combination of support for the judicial need concerned.

10.5 Chapter Conclusion

This chapter has set out governance considerations and a phased evaluative approach for the possible institutional use of AI within the Jordanian judiciary. It does not presume that AI should be adopted wherever a judicial challenge exists, but identifies institutional conditions, responsibilities, and stages of assessment that may inform future use-specific decisions. These proposals do not constitute an official national strategy or a complete implementation model; rather, they provide academically grounded guidance that may contribute to future institutional assessment and policy development. The

[556] CEPEJ 2025, paras 34–35 and 65.
[557] National Institute of Standards and Technology 2023, pp. 25, 32–33 (MAP 1.1, MAP 2.1–2.2, MAP 3.1–3.5, MAP 5.1 and MANAGE 1.1).

final chapter brings together the principal findings, contributions, recommendations, limitations, and implications of the dissertation.

11. Conclusion

This dissertation examined the possibility of using AI to support judicial decision-making in Jordan in response to challenges relating to judicial workload and judgment quality. The study did not proceed from the assumption that AI necessarily represents a better solution to the problems facing the judiciary, or that it is inherently incompatible with the judicial function. Its central finding is that the appropriateness of its use depends on the nature of the function it performs, the judicial need to which it responds, the risks associated with it, the safeguards governing its use, the institutional environment within which it is introduced, and the outcome of balancing its adoption against other human, institutional, procedural, and technological alternatives capable of addressing the same need.

This issue is particularly significant in Jordan because AI has not yet been formally integrated into judicial decision-making. This makes it possible to examine judicial needs, the potential functions of these systems, and the risks and conditions associated with them before they become an established part of judicial practice. At the same time, the issue is no longer entirely prospective, as general-purpose AI tools have become widely available, and the findings of the study showed that some Jordanian judges have already become familiar with or used them individually. This creates a need for a clear institutional position even before any formal adoption.

11.1 Answers to the Research Questions

The study concludes that the challenges and needs it identified in a number of tasks associated with judicial decision-making in Jordan, together with the functional relationship demonstrated by the analysis between these needs and AI capabilities, provide a justified basis for considering specific AI applications as an additional form of support. This finding does not mean that existing reforms have failed or that AI has been shown to be superior to them. The persistence of some challenges may be associated with factors relating to the implementation or scope of application of a particular reform, while in other cases it may be associated with limits on the effect that a particular reform is capable of achieving.

Accordingly, the appropriate model for the use of AI in judicial decision-making in Jordan is one of selective and constrained additional support, differentiated according to function, rather than general adoption or the replacement of judicial discretion. The study has already identified a number of functions in which there is a serious basis for considering such support. However,

moving from this finding to institutional adoption requires each proposed use to be translated into a specific and assessable use case and examined in its actual context in terms of its effect on judicial discretion, the verifiability of its outputs, the associated risks and safeguards, the relevant institutional conditions, existing responses, and realistic alternatives. It was not within the scope of this study to conduct such a detailed institutional assessment for every use, but rather to establish the basis that justifies its consideration and the need to subject it to such an assessment before adoption.

11.1.1 Judicial Workload and Judgment-Quality Challenges

The first research question concerned establishing the principal challenges relating to judicial workload and judgment quality that affect the work of Jordanian judges.

With regard to workload, administrative records and interview accounts indicate substantial demands associated with the volume and composition of cases handled by Jordanian judges. Official data provide important indicators of caseload, while the interviews illustrate how participating judges experienced those demands in practice and how workload may vary according to the nature of cases, judicial assignments, and the support available to judges. These findings support the distinction developed in this dissertation between caseload and the broader concept of judicial workload, which also encompasses the time and effort required by different judicial tasks.

The findings also showed, however, that case numbers alone do not reflect the full workload borne by a judge. Actual workload varies considerably according to the nature and circumstances of cases and the time and effort they require. Reliance on case numbers alone may therefore conceal important differences in the actual demands of judicial work.

The findings further revealed other dimensions of workload associated with the forms of support available to judges. The interviews demonstrated the time and effort required for legal research and judgment preparation, together with relative shortcomings in some legal research tools and in the forms of support available to assist with the preparation of judicial judgments. Workload therefore arises not only from the number of cases, but also from the nature of the tasks that must be performed within each case and the extent of the institutional and professional support available for carrying them out.

With regard to judgment quality, relevant reports and documents, together with the interview findings, demonstrated a range of factors that affect in practice the conditions in which judicial judgments are prepared. In addition to workload pressure, these factors include the nature of

certain disputes and the specialised technical issues they involve, as well as the need to rely on experts. The material reviewed in this study also indicates limitations in the available institutional assessment of the constituent elements of judgment quality, and no detailed Jordan-specific evaluation of judgment quality was identified within the sources reviewed.

The findings showed that reliance on experts is an important feature of judicial work, but that a range of challenges remain concerning the quality of expert evidence, differences in technical assessments, delay, cost, and the judge's ability to understand the basis of a technical conclusion and evaluate it independently.

The study demonstrates that judicial workload and judgment quality are interconnected, but they do not constitute the same problem. Workload concerns the pressures placed on the judge's time and practical capacity to perform the required tasks, whereas judgment quality concerns the conditions and factors necessary to reach an accurate and reasoned judgment based on an adequate understanding of the facts, evidence, and law. Taken together, these findings indicate that responses to the challenges facing the judiciary should not focus solely on the volume of cases completed, but also on the conditions in which judges work and the quality of the tools, resources, expertise, and support available to them.

11.1.2 The Role of Existing Reforms and Non-AI Alternatives

The second research question concerned the reforms adopted by Jordan to address challenges relating to judicial workload and judgment quality, and the extent to which they have contributed to addressing these challenges in practice.

The analysis of official policies and documents showed that, over a period of years, Jordan has adopted a wide range of measures, including procedural reforms, judicial specialisation, continuing training, and the development of technical offices. These measures address the identified challenges through different mechanisms, while the evidence examined in this study also indicates that difficulties remain in some areas. The study does not, however, isolate the causal effect or measure the overall effectiveness of each individual reform. This does not mean that these reforms are in themselves inappropriate or insufficient, as the study showed that limited results may arise from factors relating to implementation, resources, scope of application, continuity, institutional design, or the extent to which support reaches the judges and courts for which it is intended. The persistence of some challenges therefore does not in itself provide a basis for replacing or discontinuing these reforms. Rather, it requires first identifying the reasons why the challenges persist and then considering whether the most

appropriate response is to improve the existing reform, supplement it, or add another form of support.

The study also showed that assessing the impact of these reforms is complicated by the available measurement tools. Evaluating their effects requires indicators that go beyond case numbers and completion rates and that make it possible to measure the nature of workload, the time required for different tasks, the level of support available, and the effect of the measure on the particular problem it was introduced to address. There is therefore a need for an up-to-date and systematic evaluation of existing reforms to determine what they have actually achieved, what has not fully achieved its objectives, and the factors that explain those outcomes.

11.1.3 Contemporary AI Developments Relevant to Judicial Work, Their Risks, and Judges' Perceptions

After identifying the challenges facing judges and the reforms adopted by Jordan to address them, the study turned to contemporary developments in AI and their relevance to judicial work. The analysis showed that AI does not represent a single system or a single capability, and that recent developments, particularly in text processing, the analysis of large volumes of information, and content generation, have brought this technology closer to tasks associated with legal research, case-file review, information organisation, drafting, and other related activities.

These systems and uses are not identical in their nature or in the degree of their potential effect on judicial work. The risks associated with them therefore cannot be understood separately from the function performed by the system and its proximity to judicial discretion. On this basis, the third research question examined developments relevant to judicial work and their associated risks, together with Jordanian judges' perceptions of those risks in a pre-deployment context.

Drawing on academic literature, reports, international guidance, and comparative experience, the study identified a range of risks relating to accuracy, overreliance, judicial independence, fairness and bias, transparency, and threats to individualised justice. The interviews demonstrated the extent to which these concerns were present in the perceptions of Jordanian judges. The participating judges' attitudes were characterised more by caution than rejection, with the most prominent concerns relating to overreliance on outputs, inaccuracy, confidentiality, and the potential misuse of judicial data. By contrast, structural risks, such as

algorithmic bias and effects on justice, were less prominent, which may be explained in part by the pre-deployment context and the absence of actual institutional use of these systems. The study also found that the seriousness of these risks varies according to the function performed by the system. The required level of accuracy, transparency, and oversight should therefore correspond to the nature of the use.

11.1.4 Legal and Normative Criteria for the Use-Specific Assessment of AI Uses

The fourth research question asked which legal and normative criteria should govern the assessment of particular AI uses in Jordanian judicial decision-making, and how those criteria should structure the evaluation of benefits, risks, safeguards, and alternatives.

The study demonstrates that moving from proof that AI is capable of performing a particular function to a decision to use it judicially requires an assessment specifically tailored to that use and to its actual institutional context. A general comparison between the benefits and risks of AI, or reliance on a limited number of indicators such as speed, cost, or accuracy, is insufficient. Judicial, legal, institutional, technical, security, financial, economic, and professional considerations may enter into the decision, and their importance may vary according to the function and context. Nor are these considerations necessarily capable of being traded off on an equal basis. An impact on a fundamental judicial principle or a right associated with a fair trial may carry a weight that differs in its nature from a limited gain in time or cost. The study therefore calls for a comprehensive and use-specific assessment, without claiming to have conducted such a detailed balancing exercise for every function or to have predetermined all of its elements and their respective weights.

The framework distinguishes between the intensity of assessment required by a particular function and the separate question of its deployment status. Defined assistance involving readily verifiable sources and limited effects on the workflow may warrant baseline assessment, while uses that frame contested facts, legal analysis, expert interpretation, or draft reasons require enhanced assessment. Uses incompatible with applicable legal or institutional requirements, or whose risks cannot be adequately controlled, remain excluded under the present analysis. This classification does not itself constitute approval for deployment.

11.1.5 Functions that AI May Support in Judicial Decision-Making

The fifth research question examined which judicial functions and tasks identified as sources of workload or decision-quality difficulty in Jordan may provide a justified basis for

considering AI as an additional form of support. The analysis demonstrated a clear functional relationship between some of the tasks identified by the study as sources of judicial workload or difficulty and contemporary AI capabilities, providing a justified basis for including specific applications among the options that merit serious institutional assessment.

The study showed that informational and preparatory functions may provide an area for the use of AI, particularly the extraction of information from case files, document summarisation, and AI-assisted legal research. AI also provides a justified basis for evaluating support for certain aspects of judgment preparation, such as organising materials and arguments and assisting in the preparation of descriptive sections or preliminary drafts, within limits and safeguards that prevent such assistance from becoming a substitute for judicial work requiring independent discretion and reasoning. The study also demonstrated the possibility of considering uses relating to case comparison and the organisation of precedents or judicial trends, as well as some forms of assistance relating to technical materials and expert evidence, areas that were associated in the preceding chapters with challenges affecting judgment quality.

11.1.6 Implementation Challenges and Governance Considerations for Judicial AI in Jordan

The sixth research question asked what challenges may affect the implementation of judicial AI in Jordan and what governance considerations should inform its responsible evaluation, testing, possible adoption, and the future development of a national strategy.

One of these challenges concerns the technological dimension, including infrastructure, data quality, cybersecurity, technical support, updating, and monitoring, together with building the national capacity necessary to design, develop, or adapt systems to meet the needs of the Jordanian judiciary. There is also a need to ensure that these systems are suitable for the Arabic language, the Jordanian legal system, and the legal and judicial sources actually used in practice, rather than merely importing systems designed or trained in different legal and linguistic environments and assuming their suitability for the Jordanian context without sufficient development or testing.

Another challenge concerns the financial dimension, including the cost of designing the system or contracting with international companies to assist with its design, preparing the infrastructure, maintenance, updating, and training, in addition to the costs of replacing the system or moving to another provider. Costs should therefore be assessed over the entire life cycle of the system, rather than only at the initial preparation stage.

The cultural and professional dimension concerns the attitudes of judges and other judicial personnel towards technology, the degree of trust placed in it, their willingness to change certain established working practices, and the institution's ability to introduce technology in a manner that preserves the professional role of the judge and does not treat adoption as a technical change detached from judicial culture.

Related to this is the educational and training challenge. The use of AI in the judiciary requires knowledge that goes beyond the basic operation of a tool and includes understanding the nature and limitations of the system, how to verify its outputs, how to identify errors, and the permitted boundaries of its use. Training should be continuous and connected to the actual function performed by the system.

Legal, regulatory, and legislative challenges also arise concerning the adequacy of the existing framework to accommodate judicial AI uses, particularly in relation to the legal basis for use, data protection and confidentiality, responsibility, the rights of the parties, and disclosure. Some applications may require legislative or regulatory amendments before institutional adoption.

Taken together, these challenges show that any move towards institutional use requires coordination across legal, technical, financial, educational, and regulatory dimensions. Chapter Ten addresses the governance dimension of this research question by setting out governance considerations and a phased evaluative approach for the assessment, testing, and possible adoption of particular AI applications. These proposals do not constitute an official national strategy or a complete implementation model but may inform future institutional assessment and policy development in Jordan.

11.2 Contributions of the Study

This dissertation makes a number of interrelated academic and practical contributions.

First, the study provides new empirical knowledge concerning the practical challenges faced by Jordanian judges in judicial decision-making, their assessment of existing reforms, and their perceptions of the use and risks of AI. Combining institutional evidence with judges' professional experience made it possible to move beyond the description of official indicators and policies towards an understanding of how these issues manifest themselves in everyday judicial practice.

Second, the study provides a more precise framework for understanding the challenges relating to judicial workload and judgment quality in Jordan. It demonstrates that the number of cases constitutes an important component of workload but does not by itself reflect the actual demands of judicial work. It also distinguishes workload and judgment quality as interconnected but distinct challenges and identifies the factors that connect them or affect each of them.

Third, the study provides a contextual analysis of the judicial reforms adopted by Jordan to address these challenges, combining official reports with judges' assessments of their implementation and practical effects. This analysis contributes to distinguishing between limitations inherent in the nature of a reform and limitations in its results arising from factors relating to implementation, resources, coverage, or continuity, a distinction that is important before considering the introduction of new technological solutions.

Fourth, the study provides qualitative evidence on Jordanian judges' perceptions of AI and its risks before organised institutional adoption, offering a reference point for future post-adoption research. It distinguishes the immediate operational concerns expressed by judges from the longer-term structural risks emphasised in the literature and international experience.

Fifth, the dissertation offers a needs-based, function-specific assessment of judicial AI, focusing on tasks rather than technologies or general attitudes. It connects challenges identified in Jordan with AI capabilities and classifies potential uses by risks and safeguards. It also identifies verification effort as a condition of practical benefit: if checking requires repeating the original task, expected efficiency gains may disappear. Further task-specific research and comparison with existing alternatives remain necessary before institutional adoption.

Sixth, the study proposes a staged, evidence-conditioned governance approach for judicial AI in Jordan, defining institutional responsibilities, safeguards, and criteria for testing, limited use, or rejection. It further limits judicial inspection of AI-use records to compliance oversight, excluding assessments based on judges' acceptance of automated outputs or attempts to reconstruct confidential deliberations, thereby protecting judicial independence.

11.3 Principal Recommendations

First, the Judicial Council should require a comprehensive and use-specific assessment before any institutional decision to test or adopt a judicial AI application**.** Each proposed AI application should be assessed independently according to its function and context, taking into

account judicial, legal, institutional, technical, security, financial, and professional considerations, together with available alternatives and the possibility of improving existing responses. These considerations should not be treated as equal, particularly where fundamental judicial principles or the rights of the parties are involved.

Second, where the preceding assessment provides a justified basis for testing, the Judicial Council, supported by an evaluation function sufficiently independent from the implementation team, should authorise limited pilots before wider use. Where the results of the assessment justify testing a particular AI use, implementation should begin with limited and controlled pilot projects. Approval should relate to the specific function, users, type of data, and context in which the system was tested, rather than to the system or model in general. Any subsequent expansion should also be based on actual evidence concerning accuracy, verifiability, practical value, and professional and institutional effects.

Third, irrespective of whether AI is ultimately adopted, the Judicial Council and Ministry of Justice should improve the measurement of judicial workload and judgment quality and support systematic evaluation of existing reforms. More precise indicators should be developed to measure judicial workload and judgment quality, extending beyond case numbers and completion rates to include the nature of cases, the volume of case files, the time required for research and judgment preparation, the use of experts, and other actual demands of judicial work. In parallel, an up-to-date and systematic evaluation of existing reforms should be undertaken, including judicial specialisation, technical offices, training programmes, databases, and expert-evidence reforms, in order to determine the extent of their implementation, resources, coverage, continuity, and actual effects, and to distinguish between limitations inherent in the reform itself and problems associated with the manner of its implementation.

Fourth, before any institutional adoption, the Judicial Council and Ministry of Justice should develop clear governance arrangements for judicial AI. These arrangements should define permitted and excluded uses, confidentiality and data-protection requirements, procurement and contracting conditions, updating and auditing, incident reporting, suspension, and replacement. They should also preserve effective Jordanian institutional control over judicial data, authorised purposes, permissions, auditing, continuity, and termination, while limiting technological or contractual dependence that could impair the ability to supervise or replace a system.

Fifth, the Ministry of Justice, in coordination with the Judicial Council and relevant technical institutions, should strengthen national capacity and ensure operational continuity**.** National capacities necessary to design, develop, or adapt AI systems to the Arabic language, the Jordanian legal system, and the needs of the judiciary should be strengthened. This does not preclude benefiting from foreign companies or expertise, provided that such cooperation does not result in technological or commercial dependence. Data portability and the ability to move between systems or providers should also be ensured, together with alternative operational plans established from the design and contracting stages to guarantee the continuity of the administration of justice in the event of system failure, service interruption, termination of the contract, or a technical or security incident.

Sixth, the relevant legislative and regulatory authorities should address any legal adaptation required by particular uses, while the Judicial Institute should develop the corresponding professional capacity**.** The adequacy of existing legislation and procedural and regulatory rules to accommodate proposed uses should be assessed, and necessary amendments should be made where required by the nature of the use, particularly in relation to the legal basis for use, data protection and confidentiality, responsibility, the rights of the parties, disclosure, contracting, and auditing. In parallel, continuing judicial training programmes should be developed covering the nature and limitations of systems, verification of outputs, data handling, identification of errors, and the professional and legal rules governing their use.

Seventh, the Judicial Council should ensure judicial participation and multidisciplinary assessment from the earliest stages of any institutional initiative**.** Judges should be involved at every stage of the process, beginning with the identification of problems and needs, through the design of uses and the testing and assessment of systems, and ending with decisions on approval, expansion, or discontinuation. Judicial participation should be accompanied by independent expertise in law, technology, cybersecurity, ethics, economics, and data management, ensuring that decisions are based on multidimensional assessment rather than technical considerations alone.

11.4 Limitations of the Study and Future Research

The findings of this study are subject to a number of limitations that define the scope of the conclusions that may be drawn from them and, at the same time, open avenues for future research.

First, given the qualitative and purposive nature of the sample, the interview findings should be understood as professional and contextual evidence concerning the participants' experiences and perceptions, rather than as a statistical representation of the Jordanian judiciary as a whole. Future research involving larger and more diverse samples could examine the extent to which perceptions and experiences differ according to seniority, level of court, specialisation, geographical location, and experience in the use of technology.

Second, the empirical findings reflect judges' perceptions at a stage preceding the actual institutional use of AI. They therefore cannot establish how practice and behaviour may change following adoption. Post-deployment studies would constitute an important extension of this research, particularly in examining changes in judges' perceptions, verification practices, patterns of reliance on outputs, and the professional, behavioural, and institutional effects that cannot be observed before actual use.

Third, the study did not test a particular AI system on Jordanian case files or compare an AI-assisted workflow with the conventional process for the same task. Applied testing using Jordanian legal and judicial materials therefore represents an important area for future research, particularly in legal research, case-file review, assistance with judgment preparation, case comparison, and the analysis of expert evidence.

Fourth, the study did not determine the comparative institutional feasibility of AI for every judicial function, as doing so would require applied assessments extending beyond the scope of this dissertation. Future studies and the relevant institutions should assess each proposed use independently in light of the possibility of improving existing responses and other available alternatives, taking into account the relevant judicial, legal, institutional, technical, security, financial, economic, and professional dimensions. Further research is also warranted on how differences in the importance of these considerations should be addressed, particularly where some concern judicial principles or fundamental rights that are not amenable to trade-off in the same manner as considerations of cost or operational efficiency.

Fifth, the substantive scope of the study opens another area for research concerning organisational and administrative functions that fall outside the direct process of judicial decision-making, such as case management, the organisation of court hearings, and certain judicial follow-up activities. The significance of these areas for decision-making may be indirect, as reducing judges' organisational and administrative burdens may provide them with more time and effort for research, examination of evidence, and judgment preparation. These

functions therefore warrant independent studies that first identify the challenges they involve and then assess reforms, human and digital measures, and AI as potential responses.

Finally, the continuing speed of development in AI technologies means that some assumptions concerning the current capabilities or limitations of systems may change over time. It will therefore be important to reassess the continuing validity of the findings, classifications, and safeguards proposed in this dissertation as technology and judicial practice develop, including through comparative studies involving Arab judicial systems and legal environments with similar linguistic, institutional, and financial conditions.

11.5 Concluding Reflection

Technology, including AI, should not be treated as an end that institutions seek to introduce merely because its use has become possible, and then measure their progress by the number of tasks they have successfully automated. The value of technology does not arise from its presence within an institution, nor from its capacity to replace an existing form of performance with a machine, but from its ability to serve higher and enduring purposes and values. In the judiciary, these purposes remain connected with justice, independence, fairness, responsibility, and human dignity.

This also means that AI should not be regarded as the inevitable or ultimate solution to the challenges affecting judicial work. A use-specific assessment may show that the capabilities of available systems do not provide sufficient additional value to justify their risks, or that their use would conflict with judicial requirements that should not be compromised for operational gains. In such circumstances, improving existing responses or awaiting more suitable solutions may be preferable, even if some aspects of the challenge remain. The objective is not to eliminate every judicial difficulty at any cost, but to reduce it as far as reasonably possible through means compatible with the requirements of justice.

This perspective becomes particularly important because the decision to introduce new technology into a judicial institution may be taken relatively quickly, and its implementation may become easier as tools and digital infrastructure develop, whereas addressing its consequences may not be equally easy if they extend to principles and safeguards established over a long period of time. Systems can be modified or replaced, but judicial independence, trust in judicial judgments, procedural fairness, and responsibility for decisions are values that cannot simply be restored to their previous state by withdrawing from a technological system

or terminating a contract with a provider. Technological development therefore does not diminish the importance of institutional caution; rather, it increases the need for values to precede technological decisions and to continue to govern them.

At the same time, the future of the judiciary should not be built around the limits of AI as they appear at a particular point in time. What today represents a limitation in accuracy, transparency, or security may change rapidly, while capabilities that were unavailable when an initial decision was made may later emerge. The judiciary should therefore not adapt its standards to what technology currently offers but should determine in advance what it needs and what it is not prepared to compromise and then assess both existing and future systems against those requirements. The judiciary should not be merely a consumer of what the market produces; the clearer and more firmly established its requirements are, the greater its ability to steer demand towards technologies that respond to the needs of justice rather than reshape justice according to the limitations of the available product. Technology should therefore evolve to meet the requirements of justice, rather than justice changing to accommodate technology.

Summary

This dissertation examines the future of support for judicial decision-making in Jordan in light of challenges relating to judicial workload and the need to safeguard the quality of judicial judgments, alongside the rapid development of AI technologies. The study proceeds from the view that discussion of AI in the judiciary should begin with the identification of existing judicial problems and needs and the assessment of available responses to them, before considering whether specific AI applications may provide additional support consistent with the values and safeguards on which the judicial function depends. The study combines documentary analysis, literature review, and semi-structured interviews with eighteen Jordanian judges. The findings indicate significant workload demands and challenges concerning the conditions for maintaining judgment quality and the availability of appropriate support for certain tasks associated with judicial decision-making.

The study further shows that Jordan has adopted a range of reforms, including procedural reforms, judicial specialisation, continuous training, and technical offices. However, the persistence of some challenges does not necessarily indicate the failure of these reforms, as their limited effect may be related to implementation problems or to limitations in their design or scope. The study therefore does not treat AI as an automatic substitute for existing reforms, nor does it assume that reform choices are confined to AI and those existing measures. Improving current measures, developing more effective alternatives, or even accepting the persistence of certain challenges may in some circumstances be preferable where overcoming them would require compromising fundamental judicial values. Against this background, the dissertation examines AI capabilities relevant to judicial work and emphasises that AI does not represent a single technology or a uniform level of capability. Technical capability or functional relevance alone is insufficient to justify judicial use, particularly as the function of a system approaches the core of judicial discretion.

The study also identifies operational and structural risks, including inaccurate outputs, overreliance, lack of transparency, bias, potential effects on judicial independence, confidentiality, and individualised justice. The interviews show that Jordanian judges do not reject AI in principle, but approach it with caution, and that the seriousness of these risks varies according to the function performed by the system and its proximity to the exercise of judicial discretion. One contribution of the dissertation is the articulation of a normative basis for the use-specific assessment of judicial AI, distinguishing the intensity of assessment required by a particular function from the separate question of its deployment status. This approach proceeds

from the principle that the ability of a system to perform a particular task does not automatically establish its suitability for judicial use. Assessment should therefore consider the need addressed by the proposed use, the nature of the function, the expected benefit, the associated risks and safeguards, existing responses, and available alternatives, while avoiding the reduction of assessment to considerations such as speed, cost, or accuracy where fundamental judicial values are at stake.

When the needs identified by the study are connected with current AI capabilities, several functions emerge as warranting further institutional assessment in Jordan, including fact extraction and document summarisation, legal research, support for judgment preparation and the drafting of certain parts, case comparison and the organisation of precedents, and assistance in analysing technical materials and expert evidence. This does not mean that the study has demonstrated the superiority of these uses or recommended their immediate adoption; rather, it identifies areas that justify detailed applied assessment and limited, controlled testing. Moving towards institutional implementation also raises challenges relating to technological infrastructure, cost, professional culture, and legislative requirements. The study therefore sets out governance considerations and a phased evaluative approach beginning with evidence-building and readiness, followed, where justified, by controlled testing and only then by consideration of limited institutional use based on documented results. This approach preserves the central role of the judge, judicial responsibility, and meaningful human oversight, while leaving any decision on wider adoption to subsequent legal, technical, and institutional assessment.

The study concludes that the value of AI in the Jordanian judiciary does not lie merely in introducing technology or expanding automation, but in its capacity to provide additional support for specific problems in a manner consistent with the requirements of justice. The dissertation therefore adopts neither a position of general adoption nor general rejection, but a selective, gradual, function- and context-specific approach in which technology is assessed in light of judicial needs and values, rather than judicial work being reshaped to accommodate what technology happens to offer at a particular moment.

Magyar Nyelvű Összefoglaló

Ez a doktori értekezés a bírói döntéshozatal támogatásának jövőjét vizsgálja Jordániában, különös tekintettel a bírói munkateherrel és a bírói határozatok minőségének megőrzésével kapcsolatos kihívásokra, a mesterséges intelligencia technológiáinak gyors fejlődésével párhuzamosan. A kutatás abból indul ki, hogy a mesterséges intelligencia igazságszolgáltatásban történő alkalmazásáról szóló vitának a fennálló bírói problémák és szükségletek azonosításával, valamint az ezekre adott meglévő válaszok értékelésével kell kezdődnie, és csak ezt követően vizsgálható, hogy egyes konkrét MI-alkalmazások képesek-e olyan kiegészítő támogatást nyújtani, amely összeegyeztethető a bírói funkció alapjául szolgáló értékekkel és garanciákkalA kutatás dokumentumelemzést, szakirodalmi áttekintést és tizennyolc jordániai bíróval készített félig strukturált interjúkat ötvöz. Az eredmények azt mutatják, hogy a jordániai bírák jelentős kihívásokkal szembesülnek a jelentős bírói munkateher, valamint a bírói határozatok minőségének megőrzése és a döntéshozatalhoz kapcsolódó egyes feladatok megfelelő támogatásának rendelkezésre állása tekintetében.

A kutatás azt is kimutatja, hogy Jordánia többféle reformot vezetett be, köztük eljárási reformokat, bírói specializációt, folyamatos képzést és technikai irodákat. Bizonyos kihívások fennmaradása azonban nem feltétlenül jelenti e reformok kudarcát, mivel korlátozott hatásuk összefügghet végrehajtási problémákkal, illetve kialakításuk vagy hatókörük korlátaival. A dolgozat ezért nem tekinti a mesterséges intelligenciát a meglévő reformok automatikus helyettesítőjének, és nem feltételezi azt sem, hogy a reformlehetőségek kizárólag a mesterséges intelligencia és a jelenlegi intézkedések közötti választásra korlátozódnak. Egyes esetekben a meglévő intézkedések javítása, hatékonyabb alternatívák kidolgozása, vagy akár bizonyos kihívások fennmaradásának elfogadása is megfelelőbb lehet, ha azok teljes megszüntetése alapvető bírói értékek sérelmével járna. E háttér mellett az értekezés a bírói munkához kapcsolódó MI-képességeket vizsgálja, és hangsúlyozza, hogy a mesterséges intelligencia nem egyetlen technológiát és nem egységes képességszintet jelent. A technikai képesség vagy a funkcionális relevancia önmagában nem elegendő a bírói alkalmazás igazolásához, különösen akkor, ha a rendszer funkciója közel kerül a bírói mérlegelés lényegéhez.

A kutatás működési és strukturális kockázatokat is azonosít, ideértve a pontatlan kimeneteket, a túlzott ráhagyatkozást, az átláthatóság hiányát, az elfogultságot, a bírói függetlenségre gyakorolt lehetséges hatásokat, a titoktartást és az individualizált igazságszolgáltatás

sérelmének kockázatát. Az interjúk azt mutatják, hogy a jordániai bírák elvi szinten nem utasítják el a mesterséges intelligenciát, hanem óvatosan közelítenek hozzá, és hogy e kockázatok súlyossága a rendszer által ellátott funkciótól és a bírói mérlegeléshez való közelségétől függAz értekezés egyik hozzájárulása a bírói MI alkalmazásspecifikus értékelésének normatív megalapozása, amely megkülönbözteti az adott funkcióhoz szükséges értékelés mélységét a bevezetésről szóló döntéstől, anélkül, hogy minden lehetséges alkalmazás teljes körű bevezetési értékelésére vállalkozna. Ez a megközelítés abból indul ki, hogy annak bizonyítása, hogy egy rendszer képes egy meghatározott feladat elvégzésére, nem jelenti automatikusan azt, hogy bírói alkalmazásra is alkalmas. Az értékelésnek ezért figyelembe kell vennie azt a szükségletet, amelyre a tervezett alkalmazás reagál, a funkció jellegét, a várható előnyöket, a kapcsolódó kockázatokat és biztosítékokat, a meglévő megoldásokat és a rendelkezésre álló alternatívákat, miközben kerülni kell azt, hogy az értékelés pusztán olyan szempontokra szűküljön, mint a gyorsaság, a költség vagy a pontosság, ha alapvető bírói értékek érintettek.

A kutatás által azonosított szükségletek és a mesterséges intelligencia jelenlegi képességeinek összekapcsolása több olyan funkciót tár fel, amely Jordániában további intézményi értékelést indokol. Ide tartozik a tények kinyerése és a dokumentumok összefoglalása, a jogi kutatás, a bírói határozatok előkészítésének és egyes részeinek megszövegezésének támogatása, az ügyek összehasonlítása és a precedensek rendszerezése, valamint a technikai anyagok és a szakértői bizonyítékok elemzésének támogatása. Ez nem jelenti azt, hogy a kutatás bizonyította volna ezen alkalmazások felsőbbrendűségét, vagy azonnali bevezetésüket javasolná; inkább olyan területeket azonosít, amelyek részletes alkalmazott értékelést és korlátozott, ellenőrzött tesztelést indokolnak. Az intézményi bevezetés felé történő elmozdulás emellett a technológiai infrastruktúrával, a költségekkel, a szakmai kultúrával és a jogalkotási követelményekkel kapcsolatos kihívásokat is felvet. A dolgozat ezért irányítási szempontokat és szakaszos értékelési megközelítést vázol fel, amely a bizonyítékok összegyűjtésével és a felkészültség megteremtésével kezdődik, majd korlátozott teszteléssel folytatódikés csak ezt követően mérlegeli a dokumentált eredményeken alapuló, korlátozott intézményi alkalmazást, folyamatos értékelés és felülvizsgálat mellett, megőrizve a bíró központi szerepét, a bírói felelősséget és az érdemi emberi felügyeletet.

A dolgozat arra a következtetésre jut, hogy a mesterséges intelligencia értéke a jordániai igazságszolgáltatásban nem pusztán a technológia bevezetésében vagy az automatizáció kiterjesztésében rejlik, hanem abban, hogy képes-e konkrét problémákhoz további támogatást

nyújtani az igazságszolgáltatás követelményeivel összhangban. Az értekezés ezért sem az általános bevezetés, sem az általános elutasítás álláspontját nem képviseli, hanem szelektív, fokozatos, valamint funkció- és kontextusspecifikus megközelítést támogat, amelyben a technológiát a bírói szükségletek és értékek fényében értékelik, nem pedig a bírói munkát alakítják át annak érdekében, hogy igazodjon ahhoz, amit a technológia egy adott időpontban kínál.

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4. **Alqatawna, Ammar, and Zsolt Czékmann.** "Applying Artificial Intelligence to Strengthen Expert Evidence in Jordanian Judicial Decision-Making." *AAU Journal of Business and Law*, forthcoming.
5. **Alqatawna, Ammar, Zsolt Czékmann, and Adrienn Nagy.** "Artificial Intelligence (AI) in the Judiciary: A Necessity and an Inevitability – Jordan as a Case Study." *Arab Law Quarterly*, forthcoming.
6. **Alqatawna, Ammar.** "Risks of Using Artificial Intelligence in Jordanian Judicial Decision-Making." *International Journal for Court Administration*, forthcoming.

Appendix 1

Semi-Structured Interview Guide

English translation of the semi-structured interview guide used in interviews conducted in Arabic with members of the Jordanian judiciary.

Study title: Artificial Intelligence in Judicial Decision-Making in Jordan: A Needs-Based Assessment of Potential Uses, Risks, and Governance.

Target participants: Judges serving in the Hashemite Kingdom of Jordan.

Purpose of the interview: This interview aims to explore judges' views and professional experiences concerning current challenges in judicial work, the effectiveness of existing technological systems, and the potential use of artificial intelligence to support judicial decision-making.

Confidentiality: All responses are treated confidentially. No names or personally identifying information are reported in the dissertation, and the information collected is used solely for academic research purposes.

Participant code: P___

Part I. General Professional Information

Judicial level/function:

☐ Magistrates' Court Judge

☐ Court of First Instance Judge

☐ Court of Appeal Judge

☐ Court of Cassation Judge

☐ Public Prosecutor

☐ Other:

Principal area of judicial work:

☐ Civil

☐ Criminal

☐ Mixed

☐ Other:

Region of work:

☐ Northern Region

☐ Central Region

☐ Southern Region

Years of judicial experience:

☐ Less than 5 years

☐ 6–10 years

☐ More than 10 years

Part II. Interview Questions

Theme 1. Current Challenges in Judicial Work

What are the main challenges you encounter in relation to judicial caseload and the accumulation of cases?

In your experience, does a high caseload affect the quality of judicial decisions or the quality of judgment writing? If so, how?

To what extent, if any, do routine or administrative tasks affect the time available for substantive judicial work?

What challenges, if any, do you encounter in relation to expert evidence?

What challenges do you encounter in legal research, including access to legal scholarship, judicial precedents, or comparative law?

What challenges do you encounter in drafting judicial decisions?

What challenges do you encounter in legal reasoning or in applying legal rules to the facts of a case?

How does the changing or increasingly complex nature of modern disputes affect judicial workload?

In your view, to what extent can judicial specialisation and professional training address these challenges?

Theme 2. Technological Needs

How do you assess the effectiveness of the electronic systems currently used in Jordanian courts?

Which judicial tasks or procedures, in your view, could be improved or accelerated through the use of technology?

Theme 3. Artificial Intelligence: Knowledge, Opportunities and Risks

How familiar are you with the concept of artificial intelligence and its applications in the legal field?

Have you previously used any artificial intelligence tools? If so, in what context?

In your view, what potential benefits could the use of artificial intelligence bring to judicial work?

What concerns or risks might arise from the use of artificial intelligence in courts, including the possibility of excessive reliance on such systems by judges?

Do you have any legal or ethical reservations concerning the involvement of artificial intelligence in judicial decision-making? If so, what are they?

Appendix 2

Interview Data Processing Procedures

This appendix outlines the procedures followed in processing and analysing the data collected through semi-structured interviews with 18 Jordanian judicial officers.

1. Transcription and Translation

The interviews were conducted in Arabic and recorded with the participants' permission. Before the recordings were processed using Sonix, names and other directly identifying details were removed. Sonix was then used to transcribe the recordings into Arabic text. The resulting transcripts were translated into English using OpenAI's ChatGPT, without including information that could directly identify participants. The researcher reviewed the English translations against the original Arabic texts to verify their accuracy and preserve the intended meaning of participants' statements.

2. Organisation and Analysis of Interview Data

The researcher examined the translated interview texts and identified relevant issues and recurring concerns. The analysis was guided by the research questions while remaining open to additional issues raised by participants. Related statements were progressively grouped into broader thematic categories during the analysis and preparation of the relevant chapters. No separate formal coding register was maintained. The identification, interpretation, and presentation of the findings were undertaken independently by the researcher, without using AI tools for these analytical tasks.

3. Confidentiality and Data Protection

Participants were identified in the dissertation through numerical codes (P1–P18) rather than names. The interview recordings and transcripts were retained on the researcher's personal laptop, which is password-protected and used exclusively by the researcher. Access to these locally stored files was restricted to the researcher, and the original recordings and full transcripts were not made publicly available.

During the translation process, the researcher had disabled the ChatGPT setting that permits conversations to be used for model training. Sonix's published policy also states that customer-uploaded data are not used to train its AI models.

Statement on the Use of Artificial Intelligence

During the preparation of my PhD dissertation, I used Sonix for automated transcription and various versions of OpenAI's ChatGPT for language assistance and figure preparation. ChatGPT was used through different model versions available between 2024 and 2026. As these versions changed over time, the exact model identifiers cannot be reliably determined.

The use of these tools was limited to the following supporting tasks:

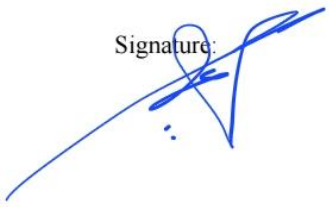
1. Transcription of interviews: Using Sonix to convert Arabic interview recordings into written Arabic transcripts. Names and other identifying information were removed from the recordings before processing.
2. Language and translation assistance: Using ChatGPT to translate Arabic interview transcripts into English and to check and improve the grammar, spelling, punctuation, and linguistic clarity of English text prepared by me. The translations were reviewed against the original Arabic texts to verify their accuracy.
3. Preparation of figures: Using ChatGPT to assist with the visual design and preparation of selected figures (Figures 1–3), based on data and information provided by me and official sources. The underlying data, sources, and final visual representations were independently reviewed and verified.

I retain full responsibility for the dissertation's content, academic integrity, research methodology, findings, and conclusions.

Name: Ammar Alqatawna

Date: 1 November 2026

Signature:



Declaration of Authorship

I certify that the thesis I have presented for examination for the PhD degree of the University of

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Miskolc, 1 Nov 2026

Ammar Alqatawna

signature

