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Artificial intelligence for legal system: Jurisprudence in the digital age

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Abstract
The research examines the profound influence of artificial intelligence (AI) on the legal system, with a particular emphasis on its capacity to reconfigure jurisprudence in the era of digitalization. We analyse the direct, mediator, and moderator effects of AI integration on various facets of the legal system by employing a mixed-methods approach and Structural Equation Modeling (SEM) with SPSS and AMOS. Our analysis begins by examining the direct effects of AI integration on critical variables such as efficacy, decision-making processes, and case outcomes within the legal domain. Following this, a mediator analysis is conducted to ascertain potential mediating factors that may exist between the integration of artificial intelligence and legal outcomes. Moderator analysis is then conducted to gain insight into the contextual factors that exert an influence on this relationship. This study seeks to enhance comprehension of the increasingly significant impact of AI on the development of law by illuminating the complex interconnections between AI technologies and jurisprudence.

Keywords: Artificial intelligence, legal system, jurisprudence, digitalization, decision-making, case outcomes, digitalization

Introduction
Within a particular society, the idea of justice plays a vital role in ensuring equality, protecting individual rights, and maintaining established cultural norms. Recent technology breakthroughs have had a significant influence on the legal field and the judicial system [1]. Scholars, professionals, and politicians in the legal sphere are becoming interested in artificial intelligence (AI) as a significant technological advancement [2]. Artificial intelligence (AI) is a branch of computer science that aims to create computer systems and algorithms that can do jobs that are normally performed by humans [3]. This covers a variety of methods that enable computers to learn, think logically, understand sensory data, speak, and adjust to novel circumstances. Neural networks, data analytics, machine learning, and natural language processing are a few examples of these techniques [4]. The long-term goal of artificial general intelligence (AGI) is to replicate human cognitive capacities, whereas narrow AI concentrates on specific skills. In general, artificial intelligence (AI) refers to information processing methods that allow computer systems to behave intelligently and make decisions.

The judiciary, often referred to as the court system or the judicial system, plays a crucial role in a nation's legal system as it is in charge of interpreting, carrying out, and upholding the law [5]. The aforementioned system functions as a means of settling disputes, safeguarding legal rights, and enforcing court orders [6]. By making sure that legal principles are applied equitably, impartially, and consistently, the legal system seeks to uphold the authority of the law and promote social cohesion. Lee (2023). The legal customs, administrative structures, and historical advancements of several countries have an impact on the structure and makeup of the judicial system. The objective of this research is to evaluate the potential benefits of artificial intelligence (AI) on the effectiveness, equity, and usability of the judicial system.

The judicial and legal systems have undergone significant modifications as a result of artificial intelligence's (AI) rapid development. In the Indian setting, where the legal system is essential to sustaining social order and preserving justice, the integration of AI technology holds great promise for improving speed, accuracy, and accessibility. But it also introduces special challenges and moral dilemmas that need to be carefully considered [7].

Due to its large backlog of cases, few resources, and vast and complex body of laws, the

Indian judicial system stands apart from others. These barriers prevent many individuals from easily accessing legal services or from receiving justice in a timely manner. By enhancing case management, streamlining legal procedures, enabling legal research, and supporting decision-making, artificial intelligence (AI) in the legal sector has the potential to lower these obstacles.

Through computerizing the identification of evidence and the extraction of relevant data from vast amounts of authentic documents and points of reference, advances in man-made intelligence may facilitate more advanced legal examination and inquiry. This way of accessing pertinent case law and navigating legal resources may save a great deal of time and effort for scholars and lawyers. Furthermore, by aiding in contract analysis and spotting any dangers and inconsistencies, AI-powered solutions may increase the effectiveness of contract management [7].

AI can also help forecast the result of cases, which allows attorneys to deploy resources efficiently and make data-driven judgments. By using machine learning algorithms and predictive analytics, AI systems are able to examine historical case data, spot trends, and provide insights into how current cases may turn out. Cases might be settled faster and the court's burden could be decreased as a consequence.

Definition and Types of Artificial Intelligence

The development of computer programs capable of sensing, thinking, learning, and decision-making-tasks that normally require human cognition-is referred to as "artificial intelligence". There are several varieties of AI, such as:

a) **Thin simulated intelligence:** Alternatively known as limited artificial intelligence, restricted artificial intelligence is designed to do certain tasks or address particular problems within a limited area. Examples include chatbots, document analysis programs, and predictive analytics tools.
b) **General man-made intelligence:** Being as clever and capable of performing a broad variety of human tasks as humans is the aim of generic artificial intelligence. The long-term goal of true universal AI has not yet been attained.

Role of AI in Judiciary

a) **Improving efficiency and accuracy:** One of artificial intelligence's main advantages in the judicial system is improving accuracy and efficiency. Artificial intelligence (AI) driven algorithms can examine large amounts of legal data fast, which hastens case management, document review, and legal research. As a result, there are fewer backlogs and delays in the judicial system, which facilitates speedier resolution. The accuracy and consistency of court decisions are also increased by AI systems' ability to recognize patterns, precedent-setting cases, and obscure legal points.
b) **Drawing conclusions from data:** Artificial intelligence (AI) systems will provide courts access to comprehensive data analysis so they may make well-informed rulings. Artificial intelligence systems have the potential to uncover relevant laws, protocols, and precedents, therefore aiding judges in evaluating the potency of legal contentions and verifying the consistency of their decisions. By using data to inform decisions, this method increases decision-making processes' objectivity and lowers the possibility of bias or subjective judgments.
c) **Ethical concerns and transparency:** Although AI has a lot to offer the legal system, there are ethical questions raised by this as well. Verifying that AI algorithms are visible, comprehensible, and auditable was essential. The process of generating decisions or rendering judgments must be understandable, and jurists and judges must be able to interpret and challenge the results generated by artificial intelligence systems. In addition, the implementation of ethical principles is necessary to reduce AI bias, advance human rights, and prevent an excessive dependence on automated decision-making.
d) **Artificial intelligence and human judgment:** Artificial intelligence is capable of contesting court proceedings, but it shouldn't take the role of human judgment. Judges, attorneys, and other legal experts continue to play a crucial role in understanding the law, deciphering its nuances, and rendering impartial decisions. Artificial intelligence (AI) has to be viewed as a tool to assist human decision-making, facilitating better decision-making and increasing efficiency; it should never be used to take the place of the moral and compassionate components of the legal system [8].

Literature Review

Gives a general overview of legal reasoning and artificial intelligence with a concentration on expert systems in law. It covers the reasons behind developing these systems, the distinctions between expert systems and artificial intelligence, ongoing initiatives, and the notion of applying jurisprudential rigor. The idea of acquiring, representing, and using legal knowledge is also covered in this study. It ends with recommendations for more study and a University of Oxford multidisciplinary research effort. The purpose of the article is to explain computer science's promise and limits to readers who are not familiar with the subject [9].

Investigates the effects of digital technology and artificial intelligence (AIT) on education and jurisprudence. This indicates that RUDN University's Masters of Arts students receive instruction in digitalization-influenced English-language legal topics including e-filing, cyber security, and crime prevention. The obstacles of using AIT in the operations of modern attorneys are also examined in the study, including the exodus of legal professionals from the market. The chapter makes suggestions for using digital technology to enhance legal procedures and indicates that practitioners and scientists might use these results in AIT, educational, and legal processes [10].

According to [11] the field of law has been a part of human civilization since ancient times, with laws from various sources such as the Holy Scriptures, laws of God, rules of nature, laws of culture, and laws of trade. The expansion of legal philosophy known as "jurisprudence," which was shaped by the contributions of academics from many countries and cultures, has been aided by legal scholars, or jurists. Technology's application in the legal field has fundamentally altered both traditional and contemporary legal processes while streamlining research methodologies. Time-consuming tasks may now be completed in minutes or seconds in today's fast-paced society, creating an atmosphere that is both more humane and efficient about

time. There are transnational behaviors that are universally recognized across cultures, customs, ethics, and faiths. As current developments may not hold true in the future, it is impossible to predict what will happen to law today.

Explores the concept of hyperrealism in legal realism, highlighting the role of digitalization in predicting court decisions. It argues that judicial analytics, a primary tool for judicial analysis, can be influenced by personal motives and prejudices. The paper assesses the benefits and drawbacks of hyperrealism using a systemic, comparative, and multidisciplinary approach, and it makes the case for the necessity of regulatory measures to enhance justice and reduce rights abuses. It suggests regulating forensic analysis ethically, standardizing procedures, and employing expert review [12]. Explores the ways in which artificial intelligence (AI) might help constitutional democracy [13]. It highlights four fundamental components of digital power concentration that are dangerous for democracies and healthy markets. The lawless Internet and GDPR are the main topics of the paper's discussion of the interaction between technology and the law. It raises concerns about whether AI issues should be safely left to ethics or resolved by legally binding regulations that uphold the credibility of the democratic process. This research recommends a three-tiered technological impact assessment for AI and states that human rights, democracy, and the rule of law should be deeply incorporated in AI design. According to [14] Computers are increasingly performing tasks that are better than expected, including calculating mathematics, creating social networks, and making life and death decisions. They might also take over the interpretation of the law, although it is hard to see them rendering significant moral decisions. Realizing how moral judgment shapes legal interpretation is the final obstacle to giving computers complete control over legal interpretation. This relationship between modern and traditional jurisprudence is significant because, over the past 50 years, the main point of contention in jurisprudence has been the significance of morality in legal interpretation. The legal system's use of computers can be defined and limited by jurisprudence, and legal disputes can be settled by taking artificial intelligence into consideration. In tasks that were previously assumed to give a clear advantage, artificial intelligence has been demonstrated to do better than humans. The practice of law has been profoundly altered by computer technology, which has led to worries about the future of attorneys. The article looks at the nature of law to improve people's ethical ability to think and take responsibility. By interpreting and implementing the law to support activities that impact the interests of others, lawyers' primary role is to enable the practical authority of the law. After reviewing the state of the art in machine ethics and artificial moral agents, the essay concludes that human technology is still a long way from creating a computer system that can meet the demands of responsibility and authority in a liberal democratic political society [15].

Research Gap

The foundation of the research gap "Artificial Intelligence for Legal System: Jurisprudence in the Digital Age" is a clear understanding of the moral and socio-legal implications of using AI in legal decision-making. This gap includes crucial issues such as algorithmic bias and fairness, AI system transparency and explainability, legal and ethical accountability for AI-driven judgments, privacy concerns related with sensitive data processing, and AI's impact on the legal profession and court. Addressing this gap demands a multidisciplinary approach, integrating legal research, ethics, computer science, and social sciences to establish frameworks that assure AI technologies serve the public benefit while respecting fundamental concepts of fairness, accountability, and justice.

Aim of the study

In order to better understand artificial intelligence's (AI) role in the legal system, this project will examine it critically, focusing on jurisprudence in the digital age. By conducting a thorough examination, the study aims to assess how artificial intelligence (AI) is affecting legal procedures, identify potential obstacles and moral dilemmas, and suggest models for the efficient incorporation of AI technologies in line with accepted legal norms, so guaranteeing a smooth transition of the legal system in the digital age.

Objectives

1. To examine the extent to which Legal Expertise influences Legal System Performance in the context of AI adoption within the legal system.
2. To explore whether Trust in AI mediates the relationship between Legal Expertise and Legal System Performance.
3. To investigate how Ethical Concerns moderate the relationship between AI Adoption and Legal System Performance.

Hypotheses

- **H1:** Legal knowledge has a direct impact on the legal system performance about artificial intelligence's use in the judicial system.
- **H2:** Trust in AI mediates the relationship between Legal Expertise and Legal System Performance, such that Legal Expertise positively influences Trust in AI, which in turn positively affects Legal System Performance.
- **H3:** The positive effects of AI adoption on the judicial system are lessened when ethical concerns are high performance. This is because ethical concerns influence the link between AI adoption and legal system performance.

Methodology

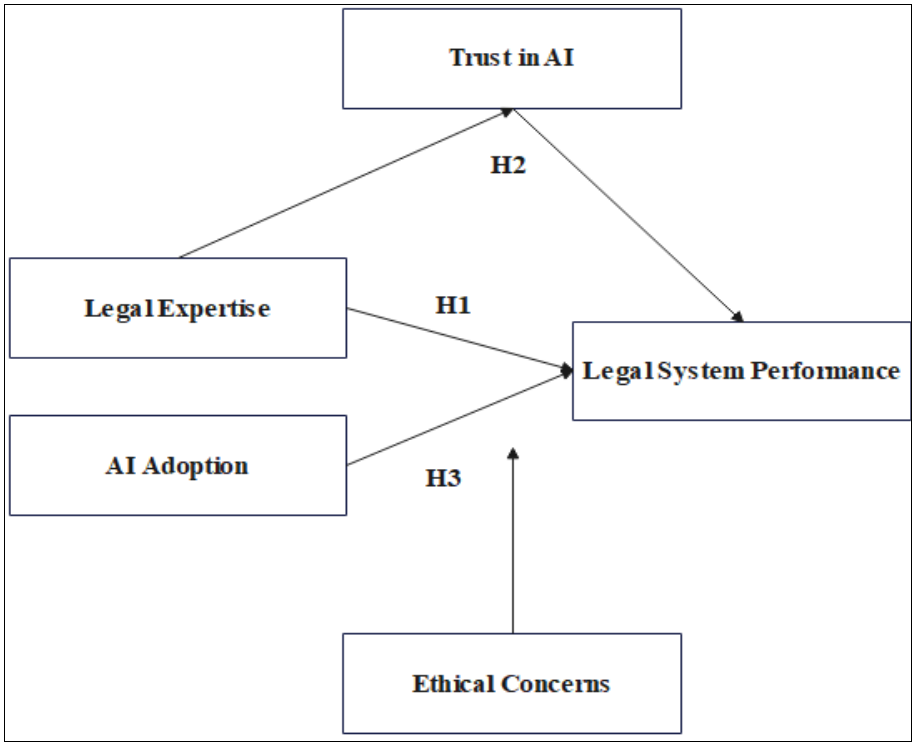

Fig 1: Conceptual Frame work

Research Design

The research design of the study is made up of several approaches and techniques that were created to logically combine various research components in order to appropriately examine the research topic that has been investigated thus far. This chapter's objective is to give details on the methods applied in this investigation. How data analysis, data collecting, and research are conducted is determined by the study design.

Sampling Technique

A targeted sampling strategy is employed to ensure relevance and representativeness within the legal context, participants selected for this study consist of legal professionals, including judges, lawyers, legal scholars, and policymakers, reflecting key stakeholders involved in shaping the legal landscape. A total of 384 participants are selected using a random sampling method, aimed at ensuring diversity and minimizing bias within the sample population. This approach facilitates a comprehensive exploration of perspectives and experiences regarding the integration of artificial intelligence within the legal system. Furthermore, a structured questionnaire tailored specifically to gather insights relevant to the legal domain is employed.

Random Sampling

With random sampling, samples are selected from a population so that every possible participant has an equal chance of being chosen. Random sampling from a pool of persons can frequently yield a representative sample of the entire community. Random sampling is one of the easiest ways to obtain information from the complete population.

When selecting a sample only once, the random sampling formula is

$$P = 1 - (N-1/N)(N-2/N).....(N-n/N-(n-1))$$

N, n, and P represent the population, sample size, and probability, respectively, in this instance.

Now that 1-(N-n/n) has been cancelled, P = n/N has been attained. Additionally, there must be a possibility that a sample will be chosen more than once: P is equal to 1-(1-(1/N)) n.

Data Collection

In order to gather information for this study, questionnaires, interviews, and secondary research were all used. Semi-structured interviews are carried out with legal experts, such as judges, attorneys, legal academics, and legislators, to gather qualitative viewpoints about the application and effects of artificial intelligence within the legal system.

Tools for data collection

The researcher employed data gathering tools in the current investigation.

Interview schedule

The primary data collected in the field was gathered using the Interview Schedule tool. This is the pre-draft question that was posed using the structured interviewing approach.

Data Analysis

Once the data was collected by random sampling, The impacts of several components were ascertained using structural equation modeling. We had a brief discussion on structural equation modeling (SEM) in the section below.

Structural Equation Modelling

Structural equation modeling (SEM) is a multivariate technique that is driven by hypotheses. It is based on a structural model that depicts the causal relationships between several variables. The variables represent the blood oxygen level dependent (BOLD) time series of y1 yn in different brain areas, specifically in the setting of functional

magnetic resonance imaging (fMRI). The theorized causal relationships are based on physically plausible links between these regions. The route coefficient quantifies the extent to which the variance of yi is dependent on the variance of yj, while holding all other factors influencing yj constant. The graphic illustrates the magnitude of each connection i j y y. It operates in a comparable manner as a partial regression coefficient. The fundamental statistical model of SEM may be succinctly stated using the equation.

Y=Ay+ u

Where y is a n s × matrix of n area-specific time series with s scans each, and u is a n s × matrix of zero mean Gaussian error components that power the modeled system (the "innovations"; see equation). In matrix A, the path coefficients are n n2 (zeroes for nonexistent connections). Reducing the discrepancy between the modeled and observed covariance matrix yields parameter estimate. Through equation modification, may be computed for any given set of numbers.

$$y = (I - A)^{-1}u$$

$$\Sigma = yy^T$$
$$= (I - A)^{-1}uu^T(I - A)^{-1^T}$$

The identity matrix, on the other hand, is me. A function of the interregional connection matrix, or (I-A)-1, is derived by converting the Gaussian innovations u into the observed time series y. A potential interpretation of this may be as a generative model that illustrates how the system's connectional structure gives rise to its functionality.

Results

Table 1: Demographic variables

		Frequency	Percent
Age	18-25 years	95	24.7
	26-40 years	89	23.2
	41-60 years	103	26.8
	60+ years	97	25.3
	Total	384	100
Educational Background	High School Diploma/GED	89	23.2
	Bachelor's Degree	103	26.8
	Master's Degree	101	26.3
	Doctoral/Professional Degree	91	23.7
	Total	384	100
Occupational Roles	Legal Professionals	98	25.2
	Technologists/Software Developers	103	26.8
	Policy Makers/Government Officials	92	24.0
	Academics/Researchers	91	23.7
	Total	384	100

The table presents demographic information about respondents based on their age, educational background, and occupational roles. In terms of age distribution, the majority (26.8%) are between the ages of 41 and 60, with the 60+ group coming in second (25.3%), whereas the age categories of 26-40 and 18-25 make up 24.7% and 23.2%, respectively. The respondents are fairly well distributed across groups in terms of their level of education, with a little higher prevalence of Bachelor's Degree (26.8%) and Master's Degree (26.3%), followed by High School Diploma/GED (23.2%) and Doctoral/Professional Degree (23.7%) The sample is divided into four occupational groups: technologists/software developers (26.8%), legal professionals (25.2%), policymakers/government officials (24.0%), and academics/researchers (23.7%). The data reveals insights into the diversity of the studied population across several demographic parameters.

Measurement model and validity

Validity and measurement models provide a formal framework for guaranteeing the correctness and significance of data, which makes them essential to research. By elucidating the connections between observed variables and their underlying conceptions, measurement models let researchers evaluate intricate ideas. Conversely, validity guarantees that the measuring tools accurately capture the intended constructions, protecting against findings that are inaccurate or misleading. In order to make well-informed judgments and advance knowledge across a range of sectors, research validity and measurement models are essential components since they offer reliable evidence for findings that can be relied upon.

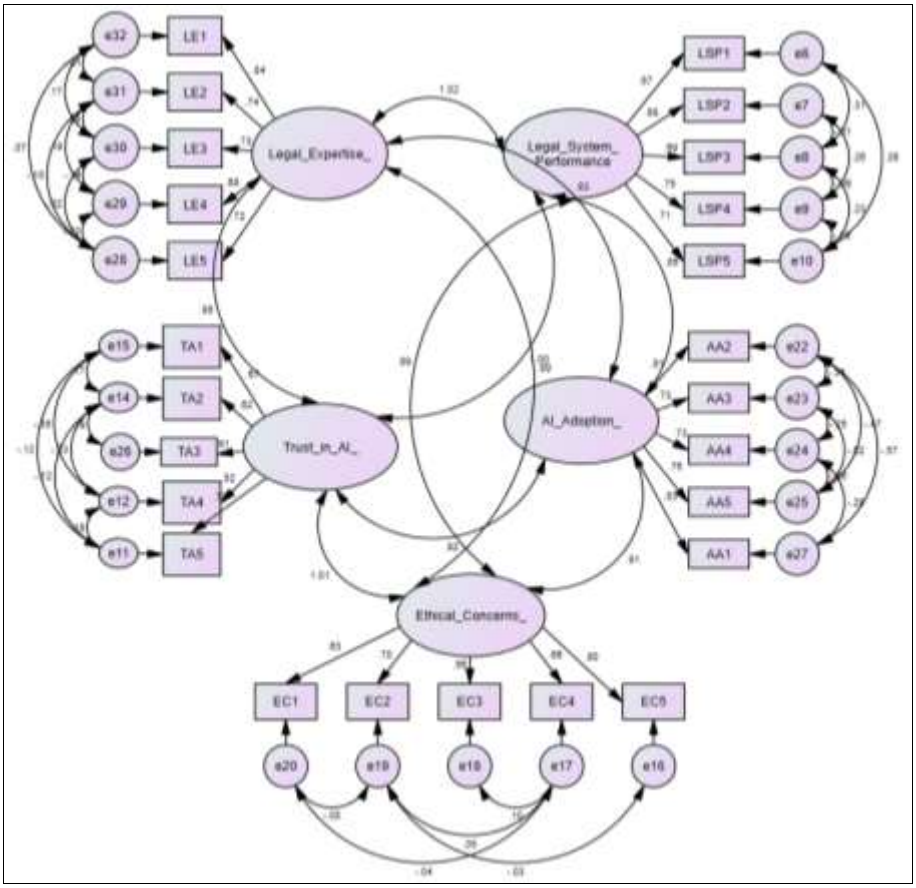

Table 2: Regression Weights: (Group number 1 - Default model)

			Unstandardized Estimate	S.E.	Standardized Estimates	C.R.	P
LSP1	<---	Legal System Performance	1.000		.672		
LSP2	<---	Legal System Performance	.963	.077	.677	12.440	***
LSP3	<---	Legal System Performance	1.008	.066	.689	15.208	***
LSP4	<---	Legal System Performance	1.194	.087	.753	13.701	***
LSP5	<---	Legal System Performance	1.115	.074	.707	15.012	***
TA5	<---	Trust in AI_	1.000		.777		
TA4	<---	Trust in AI_	1.430	.069	.818	20.823	***
TA2	<---	Trust in AI_	.860	.061	.621	14.158	***
TA1	<---	Trust_in_AI_	1.000		.668		
EC5	<---	Ethical_Concerns_	1.000		.801		
EC4	<---	Ethical_Concerns_	.705	.050	.664	13.966	***
EC3	<---	Ethical_Concerns_	.618	.054	.562	11.460	***
EC2	<---	Ethical_Concerns_	.759	.051	.703	14.751	***
EC1	<---	Ethical_Concerns_	.578	.044	.634	13.194	***
AA2	<---	AI_Adoption_	1.000		.806		
AA3	<---	AI_Adoption_	.850	.065	.727	13.151	***
AA4	<---	AI_Adoption_	.791	.055	.728	14.421	***
AA5	<---	AI_Adoption_	.864	.066	.758	13.190	***
TA3	<---	Trust_in_AI_	.844	.063	.608	13.492	***
AA1	<---	AI_Adoption_	.985	.067	.832	14.636	***
LE5	<---	Legal_Expertise_	1.000		.720		
LE4	<---	Legal_Expertise_	.862	.056	.679	15.473	***
LE3	<---	Legal_Expertise_	1.000		.731		
LE2	<---	Legal_Expertise_	1.000		.736		
LE1	<---	Legal_Expertise_	1.386	.057	.843	24.447	***

Table 3: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.964
Bartlett's Test of Sphericity	Approx. Chi-Square	6282.117
	df	300
	Sig.	.000

The preceding table, where the KMO value was 0.964, indicates that the sample was enough and suitable for the confirmatory factor analysis. The correlation between the variables used in confirmatory factor analysis was further examined using Bartlett's Test of Sphericity, and the findings indicated that the connection was significant at the 0.00 level of confidence.

Table 4: Post CFA, Cronbach alpha, factor loadings

Factors and items	Cronbach alpha values	Post CFA factor loadings	AVE	CR
Legal Expertise	.857		0.7418	0.471989678
LE1		.843		
LE2		.736		
LE3		.731		
LE4		.679		
LE5		.720		
Legal System Performance	.853		0.6996	0.44292472
LSP1		.672		
LSP2		.677		
LSP3		.689		
LSP4		.753		
LSP5		.707		
Trust in AI	.818		0.6984	0.442077702
TA1		.668		
TA2		.621		
TA3		.608		
TA4		.818		
TA5		.777		
AI Adoption	.841		0.6984	0.442077702
AA1		.832		
AA2		.806		
AA3		.727		
AA4		.728		
AA5		.758		
Ethical Concerns	.840		0.6728	0.423744165
EC1		.634		
EC2		.703		
EC3		.562		
EC4		.664		
EC5		.801		

The table presents a comprehensive overview of a research investigation that examined a range of factors including ethical concerns, trust in artificial intelligence, legal system performance, and the perception of legal expertise. These factors were assessed through surveys and evaluations. The table presents Cronbach alpha values for each factor, which serve as an indicator of the items' (questions or statements) internal consistency or reliability in relation to the factor being measured. The values in question span from 0.818 to 0.857, which collectively indicate a high degree of reliability. Factor loadings from post-confirmatory factor analysis (CFA) are shown, showing how closely each item and its matching factor are related. Nevertheless, it is not stated what the precise loading numbers are for any item. Higher values often imply stronger construct validity. The values awarded to the Average variation Extracted (AVE) between 0.423744165 and 0.471989678 show the proportion of variation explained by the component in comparison to the variance owing to measurement error. The Composite dependability (CR) ratings for most components, except for Legal Expertise (0.471989678), vary from 0.442077702 to 0.44292472, offering information about the factors' overall dependability. Every value shows a satisfactory degree of dependability. The table offers a helpful synopsis of the reliability and validity of the study's measurements, giving a numerical foundation for assessing the relevant components.

Discriminant validity test

In the context of validating measuring tools and evaluating the correlations between variables, discriminant validity is a concept rather than a specific test carried out in SPSS or any other statistical program. To make sure that separate constructs or variables in research are measuring different concepts and are not the same, discriminant validity is essential. Scholars deploy several methodologies, including confirmatory factor analysis (CFA) and correlation analysis, to substantiate the uniqueness and lack of major linkage of the metrics utilized for assessing distinct entities. Discriminant validity ensures that the measuring instruments accurately represent the many concepts they are meant to evaluate, preventing constructions, redundancies, or overlaps and enabling more thorough and accurate data analysis and interpretation.

Table 5: Discriminant Validity Test

	Legal Expertise	Legal System Performance	Trust in AI	AI Adoption	Ethical Concerns
Legal Expertise	0.86127812				
Legal System Performance	.494**	0.836420947			
Trust in AI	.583**	.544**	0.835703297		
AI Adoption	.480**	.603**	.428**	0.835703297	
Ethical Concerns	.539**	.554**	.624**	.492**	0.820243866

The discriminant validity test results in Table 4 demonstrate strong support for the distinctiveness of the constructs under study. Each construct, including Legal Expertise, Legal System Performance, Trust in AI, AI Adoption, Ethical Concerns, exhibi substantial discriminant validity as indicated by the off-diagonal correlations. Crucially, correlations across different constructs are consistently less than each construct's average variance extracted (AVE) square root, demonstrating the discriminant validity of these constructs. For instance, the correlation between Legal Expertise and Legal System Performance Equitable is 0. 494, significantly lower than the AVE of Legal Expertise (0. 861). Similarly, the correlations between other pairs of constructs also fall below their respective AVEs, underscoring the uniqueness of each construct in the measurement model.

Table 6: Model fit summary

Variable	Value
Chi-square value(χ^2)	672.293
Degrees of freedom (df)	233
CMIN/DF	2.885
P value	0.069
GFI	0.984
RFI	0.972
NFI	0.981
IFI	0.929
CFI	0.928
RMR	0.044
RMSEA	0.070

The NFI, IFI, GFI, RFI, and CFI (Normed Fit Index, Incremental Fit Index, and Goodness of Fit, respectively) all had values substantially greater than 0.90, indicating a good quality of fit to reflect the sample data ($\chi 2$ = 479.164). The Root Mean Square Error of Approximation (RMSEA) = 0.070 and the Rational Mean Square Residuals (RMSR) = 0.044 both surpass the predicted values of 0.080. The model fit the data well, as evidenced by its RMSEA of 0.070, RMR of 0.044, GFI of 0.984, and CFI of 0.928.

Proposed Hypothesis

H1: Legal Expertise directly influences Legal System Performance in the context of AI adoption in the legal system

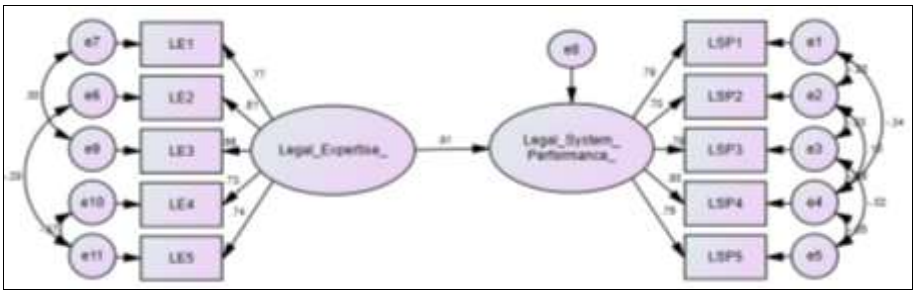

Table 7: Regression Weights: (Group number 1 - Default model)

			Unstandardized Estimate	S.E.	Standardized Estimates	C.R.	P
Legal System Performance_	<---	Legal Expertise_	.772	.040	.912	19.158	***
LSP1	<---	Legal System Performance_	1.000		.786		
LSP2	<---	Legal System Performance_	.840	.059	.701	14.183	***
LSP3	<---	Legal System Performance_	.977	.054	.789	17.968	***
LSP4	<---	Legal System Performance_	1.064	.070	.798	15.160	***
LSP5	<---	Legal System Performance_	1.000		.760		
LE2	<---	Legal Expertise_	1.000		.808		
LE1	<---	Legal Expertise_	1.000		.772		
LE3	<---	Legal Expertise_	.741	.045	.658	16.453	***
LE4	<---	Legal Expertise_	.779	.047	.725	16.565	***
LE5	<---	Legal Expertise_	.848	.054	.745	15.813	***

Table depicts a this is a theoretical structural equation model that illustrates how two variables-legal expertise and legal system performance-are interdependent. Legal Expertise is the independent variable and Legal System Performance is the dependent variable in the current model. The research reveals a statistically significant and positive correlation (β=.912, p<.05) between Legal Expertise and Legal System Performance.

The path linking these two variables demonstrates a positive correlation between Legal Expertise and Legal System Performance, with a normalized value of 0.912. The huge magnitudes of the correlation coefficient value (C.R. values) imply that the observed connections are statistically significant. Given that the components have statistical significance and p-values more than 0.05, as seen in Table 5, The model appears to match the data rather well, based on the fit indices. Seven distinct fit indices were aggregated to assess the overall model fit, and the findings indicated a

statistically significant positive correlation between Legal Expertise and Legal System Performance.

Model fit summary

Variable	Value
Chi-square value(χ^2)	81.354
Degrees of freedom (df)	26
CMIN/DF	3.129
P value	0.073
GFI	.959
RFI	.936
NFI	.963
IFI	.975
CFI	.974
RMR	0.066
RMSEA	0.075

The fit quality, as shown by the χ2 value of 81.354, was substantially higher than the threshold of 0.90. Additionally, the incremental fit index (IFI) of 0.975, relative fit index (RFI) of 0.936, comparative fit index (CFI) of 0.974, goodness of fit (GFI) of 0.959, and normalized fit index (NFI) of 0.963 were all significantly greater than 0.90. The Root Mean Square Error of Approximation (RMSEA) value of 0.075 and the Rational Mean Square Residuals (RMSR) value of 0.066 are both lower than the cutoff value of 0.080. The findings indicate that the model demonstrated a good fit to the data, as evidenced by the RMSEA value of 0.075, RMR value of 0.066, GFI value of 0.959, and CFI value of 0.974.

H2: Trust in AI mediates the relationship between Legal Expertise and Legal System Performance, such that Legal Expertise positively influences Trust in AI, which in turn positively affects Legal System Performance

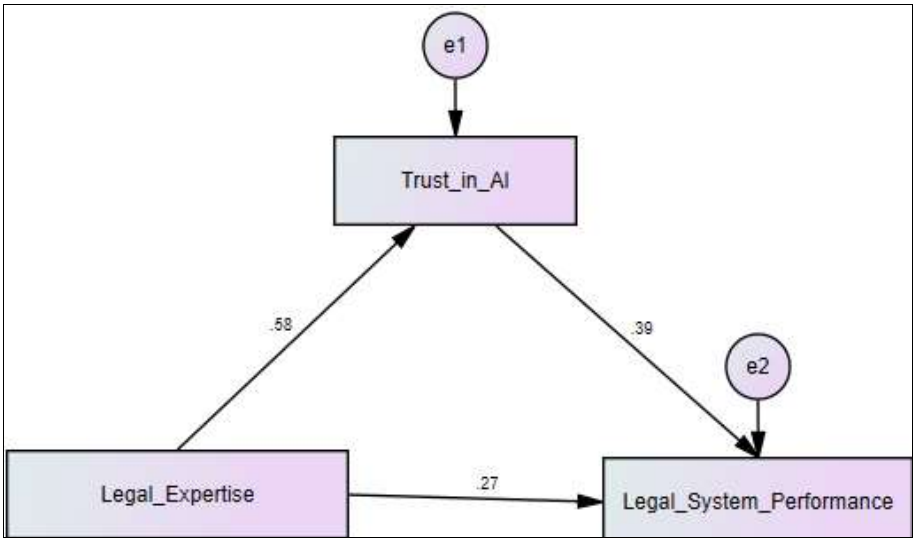

Table 8: Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	Standardized	C.R.	P
Trust in AI	<---	Legal Expertise	.570	.041	.583	14.050	***
Legal System Performance	<---	Legal Expertise	.273	.052	.268	5.248	***
Legal System Performance	<---	Trust in AI	.405	.053	.388	7.600	***

The table displays the findings of a structural equation modelling investigation that looked at the connections between the effectiveness of the legal system, legal expertise, and AI trust. An estimate of.570, a standard error of.041, and a very significant p-value (Shown by ***) reveal a robust and consistent association between legal expertise and faith in AI. This strong correlation is further supported by the standardized coefficient of.583 and a critical ratio (C.R.) of 14.050. Another noteworthy link is that legal experience improves the performance of the legal system (Estimate =.273, S.E. =.052, standardized =.268, C.R. = 5.248, $p<.001$). According to estimates of.405, .053, .053, .388 for the standardized coefficient, 7.600 for the critical ratio, and a highly significant p-value, Additionally, confidence in AI improves the functioning of the legal system. The findings underscore the interdependencies between legal competence and AI trust in the context of legal settings and imply that both are significant predictors of legal system performance.

Table 9: Standardized Indirect Effects (Group number 1 - Default model)

	Legal Expertise	Trust in AI
Trust in AI	.000	.000
Legal System Performance	.226	.000

The table presents standardized indirect effects in a Default model for Group 1 and focuses on the connections among Legal System Performance, Legal Expertise, and AI Trust. According to the table's entries, there is no indirect relationship between legal expertise and trust in artificial intelligence (a.000 value indicates this), indicating that this pathway in this model does not allow legal expertise to have an impact on trust in AI. Likewise, trust in artificial

intelligence does not indirectly affect itself (as expected and shown by a.000). The table also reveals a standardized indirect effect of.226 between Legal Expertise and Legal System Performance, with Trust in AI presumably serving as the mediator in this pathway. This suggests a positive relationship, whereby having more legal expertise may help to improve perceptions or results of legal system performance through factors associated with AI trust, even though, in this model setup, Legal Expertise does not appear to have a direct impact on AI trust.

H3: Ethical Concerns moderate the relationship between AI Adoption and Legal System Performance, such that high levels of Ethical Concerns weaken the positive effect of AI Adoption on Legal System Performance

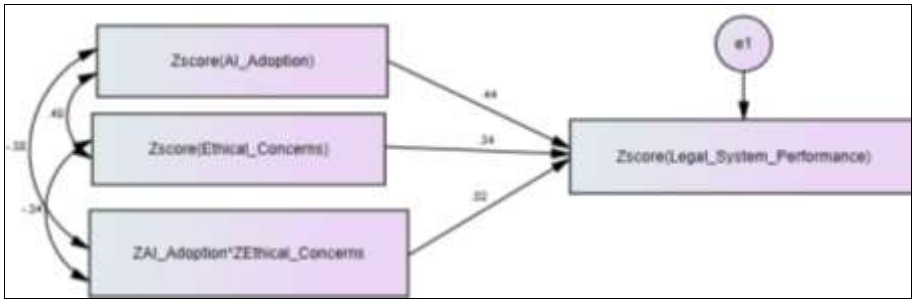

Table 10: Regression Weights: (Group number 1 - Default model)

			Unstandardized Estimate	S.E.	Standardized Estimates	C.R.	P
ZLegal System Performance	<---	ZAI Adoption	.440	.045	.440	9.786	***
ZLegal System Performance	<---	ZEthical Concerns	.343	.044	.343	7.750	***
ZLegal System Performance	<---	interaction	.015	.042	.015	.366	.715

Table 8 presents the outcomes of the Structural Equation Model (SEM), which adjusts the Zscore for Ethics Concerns and examines the connection between the Zscores for AI Adoption and Legal System Performance. With measurement errors and feedback taken into account inside the model itself, this comprehensive analysis allows testing of all relevant directions. The hypothesis suggests that Zscore and route analysis show a positive and substantial association. (AI Adoption) and Zscore (Legal System Performance) (β = 0.343, P>0.05). Zscore (Legal System Performance) and Zscore (Ethical Concerns) have a positive and significant correlation (β = 0.015, *P*<0.05).

Moderation testing

In the moderation research, Zscore (AI Adoption), Zscore (Legal System Performance), and Zscore (Ethical Concerns) are regarded as independent, dependent, and moderator variables, respectively. The findings are calculated by creating interaction terms with SPSS based on the standardized scores of the variables.

Table 11: Regression weights

		ZAI Adoption*ZEthical Concerns	Unstandardized Estimate	S.E.	Standardized Estimates	C.R.	P
ZLegal System Performance	<---	ZAI Adoption*ZEthical Concerns	.015	.042	.015	.366	.715

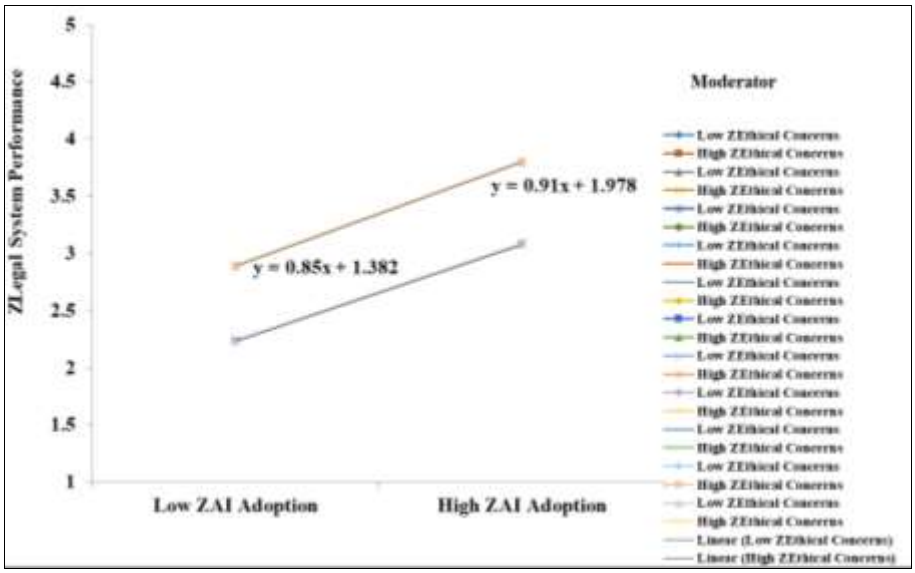

Fig 2: Regression weights

In the picture named "ZLegal System Performance," two data series are displayed on a line graph. The x-axis with the labels "Low ZAI Adoption" to "High ZAI Adoption" is most commonly used to illustrate the level of artificial

intelligence (AI) adoption in a legal system." "ZLegal System Performance" is plotted on a y-axis with a range of 1 to 5. "Low Z Ethical Concerns" and "High Z Ethical Concerns" are the labels given to the two data sets. At 1.978, the line with the steeper slope and the label "Low Z Ethical Concerns" begins, and terminates at 4.91. At a value of 1.382, the line with the shorter slope that is labeled "High Z Ethical Concerns" begins, and it stops at 4.35. Overall, the graph indicates that legal systems will function better when there are less ethical questions raised by the use of AI.

Discussion

The presented hypotheses highlight the complex interplay among legal expertise, moral confidence in artificial intelligence, the implementation of AI, and the efficacy of the legal system. They emphasize the need for continuous education and training and the critical role that the knowledge and abilities of legal professionals play in effectively utilizing AI (H1). Moreover, they propose that the effectiveness of the legal system is greatly influenced by the level of confidence in AI that is founded on legal competence. (H2), highlighting the significance of developing AI in an open and responsible manner. H3 emphasizes the significance of addressing fairness, accountability, and transparency in AI systems, while ethical concerns regarding the adoption of AI may moderate its effect on the performance of the legal system. These theories highlight the necessity of robust regulatory frameworks and multidisciplinary collaboration for the successful use of AI in the legal sector while upholding fundamental principles of justice and ethics.

Conclusion

In conclusion, the study examined several structural equation model study outlines the complex relationship between legal competence, AI trust, and legal system performance, supported by actual data. The effectiveness of the legal system is positively impacted by legal expertise. (β=0.912, p<.05), highlighting its critical importance. Furthermore, legal expertise is associated with increased trust in AI (standardized coefficient of 0.583), implying that familiarity and understanding of AI among legal professionals can boost confidence in its application. This is supported by a significant positive effect of AI trust on legal system performance. Notably, the model shows that legal experience has an indirect effect on legal system performance via AI trust, revealing a complex interplay in which legal expertise improves legal system performance even when it does not directly influence AI trust (indirect effect=0.226). The study found that lesser ethical concerns correspond with better performance outcomes in legal systems adopting AI (β=0.343 for AI adoption and β=0.015 for ethical concerns, both P<0.05). These ideals emphasize the synergistic potential of integrating legal expertise with ethical AI integration to improve legal system efficiency and effectiveness.

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