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## Development of Computational Models of Legal Knowledge, Reasoning, and Decision Making; Exploring the Perspectives of Stakeholders on AI in the Saudi Arabian Legal System

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#### Abstract

Artificial intelligence and other computational models have permeated virtually all human activities, improving operational values of professional actions. The legal system is not left, as AI has been integrated into the legal system of many countries considering its enormous benefits in legal reasoning, legal decision making and overall judicial proceedings. This study expounded on the Saudi Arabian legal system, focusing on the development and integration of computational models of legal reasoning and decision-making. The focus is to explore the acceptability of AI in the Saudi Arabian legal system, the ethical concerns, and the factors that can inform the acceptability of the computational models. A total of 137 stakeholders participated in the study, including judges, attorneys, legal researchers and AI enthusiasts. Using quantitative study approach and cross-sectional design, data was collected through questionnaire constructed with the study questions. Analysis was conducted using relevant statistical tools. The results indicate that 72.27% of the study population accepted that artificial intelligence (AI)-enabled tools have the potential to enhance the decision-making process of judges by providing them with increased information and promoting objectivity in the resolution of intricate legal cases within the context of Saudi Arabia. However, about 81.76% of the stakeholders affirm that the implementation of artificial intelligence (AI) within the legal domain prompts inquiries regarding the individuals or entities accountable for errors or biases present in AI-generated legal determinations. There is the question of, if there are mistakes in legal decisions and legal reasonings processed by computational models, who should be held responsible for the errors. The results further indicate that 97.08% of the stakeholders that participated in the survey agreed that the degree of transparency and comprehensibility exhibited by AI algorithms plays a crucial role in influencing stakeholders' willingness to embrace AIdriven solutions within the legal field. It is thus concluded that computational models in legal reasoning and legal decisionmaking is subject to stakeholders' acceptability of the efficiency of the system.

#### 1. Background of the Study

The growth of artificial intelligence (AI) systems has exerted a substantial influence on diverse sectors, including the legal sector. In the past few years, there has been an increasing scholarly focus on the development of computational models that are aimed at improving the productivity and impact of legal systems globally by incorporating legal knowledge, reasoning, and decision-making (Dyevre & Schafer, 2018). Saudi Arabia, a country dedicated to the advancement of its legal system, has placed significant emphasis on investigating the possibilities of artificial intelligence (AI) within its legal system (Almarzooq & Alzahrani, 2019).

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The integration of artificial intelligence (AI) into decision-making processes gives rise to significant inquiries pertaining to accountability, transparency, and equity (Lippi & Torroni, 2019). Examining the viewpoints of various stakeholders regarding the utilization of artificial intelligence (AI) in the process of decision-making can contribute to the development of resilient systems that align with ethical and legal standards, thereby augmenting the efficacy of judicial procedures. In addition, the integration of artificial intelligence (AI) within the legal system necessitates the careful consideration and resolution of data privacy and security issues, as legal information is of a highly sensitive nature (Alotaibi et al., 2020). Ensuring the integrity of data and complying with relevant regulations are of utmost importance in upholding public confidence in artificial intelligence (AI) technologies. Gaining insight into stakeholders' perspectives on data privacy and security concerns during the integration of artificial intelligence (AI) within the legal system is crucial for the formulation of robust protective measures.

The implementation of artificial intelligence (AI) technologies within the legal sector also gives rise to inquiries regarding the possibility of job displacement and the forthcoming responsibilities of legal practitioners (Aspris & Sartor, 2019). The analysis of stakeholders' perspectives regarding the effects of artificial intelligence (AI) on the legal workforce can provide valuable insights for policymakers and educators in their efforts to effectively adapt to the changing legal environment. In addition, the transparency and explainability of AI algorithms are essential considerations for establishing trust among stakeholders in the technology (Hashim et al., 2020). The ability to proficiently convey the rationale behind AI's decision-making to individuals without technical expertise, such as judges and litigants, is crucial in order to attain acceptance and collaboration.

In order to achieve a smooth integration of AI technologies in the Saudi Arabian legal system while maintaining principles of fairness, accountability, and transparency, it is imperative to thoroughly examine the viewpoints of stakeholders. Through the consideration and incorporation of the perspectives and viewpoints of diverse stakeholders, policymakers have the ability to establish a comprehensive and robust legal framework that optimizes the advantages offered by artificial intelligence (AI) while effectively managing and reducing potential risks associated with its implementation.

## 2. Literature Review

## 2.1. Artificial Intelligence in the Legal System; An Overview

The use of artificial intelligence has increased dramatically across many sectors, and the legal sector is no exception. Over time, computer models for legal knowledge, reasoning, and decision-making have been continually developed using AI technology. By simplifying procedures, boosting efficiency, and assisting in decision-making, these AI-powered models have the potential to alter the legal world, including the Saudi Arabian legal system. It is important to comprehend how different stakeholders see artificial intelligence in the legal system since doing so enables one to handle issues, spot possibilities, and make sure that AI is properly incorporated into Saudi Arabian law.

The use of AI in the legal field spans a variety of functions, including contract analysis, legal research, and case result prediction (Alhodaid & Fung, 2020). Artificial intelligence (AI) systems can quickly filter through enormous amounts of legal material using natural language processing and machine learning methods, making legal research and knowledge acquisition more effective. By giving them quicker access to pertinent information and judicial precedents,

this may in turn have a substantial influence on the activities of legal professionals like judges and attorneys (Dyevre & Schafer, 2018). Legal thinking is a key area where AI shows potential. AI systems may assess complicated legal issues and provide remedies based on the results of prior cases by using rule-based algorithms and case-based reasoning (Casanovas et al., 2017). Interesting considerations concerning AI's possible effect on judicial decision-making are raised by the possibility of using technology to support legal reasoning. To determine the degree to which AI may support or affect the decision-making processes of judges in the Saudi Arabian legal system, it is essential to comprehend the viewpoints of stakeholders on this issue.

Additionally, the use of AI technology to assist in actual legal decision-making is becoming more prevalent. According to Covington et al. (2018), these tools can forecast case outcomes, evaluate the persuasiveness of legal arguments, and provide guidance to judges, attorneys, and litigants. The Saudi Arabian judicial system has a lot to gain from this ability to increase decision-making accuracy and efficiency, especially in processing complicated cases and lowering case backlogs. The growing application of AI in the judicial system creates ethical, legal, and societal issues in addition to any possible advantages (Lippi & Torroni, 2019). In order to create regulations that guarantee AI deployment complies with legal and ethical norms, protects individual rights, and upholds public trust (Alotaibi et al., 2020; Weimer, 2023), stakeholders' viewpoints on these issues are crucial.

The possible effects of AI on the legal workforce are a major source of worry. Discussions concerning job displacement and the evolving responsibilities of legal practitioners have been generated by the introduction of AI to the legal industry (Aspris & Sartor, 2019). For establishing successful solutions to address possible workforce difficulties, it is essential to comprehend the attitudes and opinions of attorneys and legal practitioners in the Saudi Arabian environment. Data security and privacy are crucial for the effective use of AI in the judicial system (Hashim et al., 2020). Data integrity protection is of the utmost importance since legal information is very sensitive and private. Designing effective data protection measures within the Saudi Arabian legal framework may be aided by understanding stakeholders' viewpoints on data privacy and security problems.

Gaining stakeholders' confidence in AI technology requires transparency and explainability, according to Casanovas et al. (2017). Concerns regarding using AI in the legal system may arise from the complexity and difficulty of understanding the decision-making processes of AI systems. Therefore, understanding stakeholders' viewpoints on the openness and explicability of AI algorithms may help to improve the interpretability of AI models. The accessibility of AI-powered legal tools to different stakeholders, such as citizens and those without legal experience, must also be taken into account. To democratize access to justice and empower individuals, it is crucial to make sure that AI applications used in the Saudi Arabian legal system are simple to use and understandable to non-legal professionals (Dyevre & Schafer, 2018). The possibility for bias in AI decision-making, which may emerge from biased training data or algorithm design (Lippi & Torroni, 2019), is another element to take into account. In order to ensure that AI systems avoid discriminatory actions and uphold the values of fairness and impartiality, it is essential to understand stakeholders' opinions on this matter.

Understanding stakeholders' views on AI in the Saudi Arabian legal system is important for reasons that go beyond the practice of law. To educate politicians on societal expectations, worries, and the wider implications of AI deployment, it is crucial to engage with the public and get people' perspectives (Moustafa et al., 2020). Engaging the public may encourage collaboration and confidence in the use of AI-powered legal tools and technology.

## 2.2. Artificial Intelligence in Legal Reasoning and Decision-Making

The utilization of artificial intelligence (AI) in the realm of legal reasoning and decision-making has attracted considerable interest in recent times due to its potential to revolutionize the approach of legal practitioners towards intricate legal issues. According to Covington et al. (2018), the application of sophisticated machine learning algorithms and natural language processing techniques enables artificial intelligence systems to forecast case outcomes and provide valuable support to judges in making informed judgments. The AI-driven tools have been specifically developed to analyze extensive quantities of legal information, encompassing case precedents and pertinent statutes, with the objective of detecting patterns and correlations that can contribute to the process of legal reasoning.

Additionally, the utilization of AI systems can provide support to legal practitioners in the identification of pertinent legal arguments and case precedents, a particularly advantageous capability in intricate legal scenarios (Casanovas et al., 2017). Through the examination of extensive legal databases and the extraction of pertinent data, artificial intelligence (AI) tools possess the capability to considerably enhance the efficiency of legal research. This has the potential to result in time and resource savings for judges and lawyers operating within the legal framework of Saudi Arabia. Nevertheless, the incorporation of artificial intelligence (AI) into the process of legal reasoning and decision-making presents a set of obstacles and ethical concerns. An issue of considerable importance pertains to the potential presence of bias within artificial intelligence (AI) algorithms (Lippi & Torroni, 2019). The inadvertent perpetuation of biases and inequalities within the legal system may occur if AI models are trained using biased data. Hence, it is imperative to conduct a thorough assessment of AI algorithms in order to identify any biases that may be present and to guarantee their compliance with principles of fairness and impartiality.

An additional crucial factor to take into account pertains to the transparency and comprehensibility of artificial intelligence (AI) decision-making procedures (Hashim et al., 2020). Artificial intelligence (AI) systems frequently function as opaque entities, commonly referred to as "black boxes," which presents a significant obstacle in comprehending the fundamental rationale behind their decision-making processes. Transparency holds paramount importance within the legal domain, as it serves to establish a foundation of trust and comprehension among judges and legal practitioners regarding the underlying rationale behind recommendations generated by artificial intelligence. Furthermore, there have been raised concerns regarding the impact of AI on the displacement of human judgment and expertise (Aspris & Sartor, 2019). Although AI has the potential to provide valuable insights, it should not be regarded as a substitute for the critical thinking and legal expertise that human judges and lawyers possess. Achieving an optimal equilibrium between the utilization of AI assistance and human discretion is imperative in order to guarantee that AI effectively enhances legal procedures while upholding the integrity of legal principles.

Furthermore, the utilization of artificial intelligence in the realm of legal reasoning and decisionmaking raises inquiries pertaining to legal liability and accountability (Lippi & Torroni, 2019). In the event that AI systems are engaged in the process of decision-making, the question arises as to which entity assumes accountability for any errors or erroneous judgments that may occur. It is imperative to acknowledge and prioritize the legal and ethical considerations in order to ensure the responsible integration of artificial intelligence within the legal framework of Saudi Arabia. Additionally, it is crucial to prioritize the security and confidentiality of legal data within AI systems (Alotaibi et al., 2020). In order to maintain public trust and adhere to legal standards, it is imperative to implement robust data protection measures when AI algorithms are utilized for processing sensitive information.

## 2.3. Stakeholders Perception of AI in the Saudi Arabian Legal System

To understand the viewpoints of various stakeholders on the application of AI in the Saudi Arabian legal system, several research and surveys have been carried out. As important participants in the judicial system, judges have drawn attention. A vast majority of judges indicated favourable views about AI integration, seeing it as a useful tool to speed up legal research and case management, according to study by Almarzooq and Alzahrani (2019). However, worries regarding a possible over-reliance on suggestions produced by AI were expressed, highlighting the necessity to balance AI help with human judgment.

Another significant stakeholder group, lawyers, have expressed conflicting opinions on how AI would affect their field. According to a poll by Alhodaid and Fung (2020), some attorneys welcomed AI because of its potential to increase the effectiveness of legal research while others voiced concerns about job loss. The report emphasized how crucial it is to provide attorneys the assistance and training they need to adjust to the changing legal environment. In the framework of Saudi Arabian law, legal academics have been actively investigating the ethical implications of artificial intelligence. The issues presented by AI-based decision-making were studied from the viewpoints of legal academics and specialists by Lippi and Torroni (2019). In order to uphold moral norms and guarantee accountability, they underlined the need of openness and explicability in AI systems.

Interest has also been shown in how people see AI in the judicial system. Moustafa et al. (2020) looked at how the Saudi Arabian judicial system is perceived by the general populace. The research revealed that while people were aware of the potential advantages of AI, they also voiced worries about data privacy and the fairness of the algorithms. Gaining the public's confidence in AI-powered legal tools was considered as requiring ensuring openness and resolving privacy issues. Data security and privacy are among the top issues raised by stakeholders. Alotaibi et al. (2020) polled judges, attorneys, and legal experts about data privacy concerns related to AI in the judicial sector. The study emphasized the need for strong data protection regulations to secure private legal information and preserve public trust in AI technology.

Judges and attorneys have a common worry about AI transparency and explainability. Legal professionals' and academics' opinions on the difficulties in comprehending AI-generated suggestions were examined by Casanovas et al. (2017). To foster confidence and guarantee that AI choices are in line with legal logic, the research underlined the need of creating interpretable AI models. The possibility of job displacement brought on by the use of AI is a serious issue among stakeholders. To learn more about how lawyers feel about AI's potential to threaten their employment, Aspris and Sartor (2019) interviewed them. While some people voiced worry about possible layoffs, others underlined how AI may complement legal work and increase productivity.

Furthermore, views of the technology's impartiality and fairness have an impact on sentiments about AI in the court system. Hashim et al. (2020) investigated how judges and attorneys viewed AI's capacity to provide impartial judgments. The study emphasized how crucial it is to address bias issues and make sure that AI systems do not exacerbate current inequalities. Stakeholder participation in the decision-making process is essential to fostering a successful AI integration. Covington et al. (2018) examined stakeholders' perspectives on the integration of AI into the judicial system. It was shown that increasing the acceptability and usefulness of AI tools may be achieved by including judges, attorneys, and legal experts in their design and development.

Overall, for the proper integration of AI in the Saudi legal system, it is essential to comprehend the viewpoints of many parties. The creation of AI-powered legal tools and the formulation of regulations that uphold ethical and legal standards are influenced by stakeholders' views about the use of AI, concerns about job displacement, data privacy, transparency, and fairness concerns, and other difficulties.

## 3. Study Methodology

#### 3.1. Research Questions

The following research questions are posed to guide the data collection and analysis

- a. What are the opinions and perspectives of critical stakeholders on the use of artificial intelligence (AI) in the Saudi Arabian legal system?
- b. What ethical issues, especially those involving data privacy, transparency, justice, and accountability, have stakeholders in Saudi Arabia highlighted in relation to the deployment of AI in the legal sector?
- c. What are the main elements that affect stakeholders' acceptability and readiness to embrace AI-powered solutions in the Saudi Arabian legal system?

#### 3.2. Study Design

A cross-sectional research design, suited for quantitative analysis, will be used in the study. Data from a broad sample of people are gathered at one point in time using a cross-sectional approach. To explore their opinions on the integration of AI, data will be obtained from judges, attorneys, legal experts, and Saudi Arabian residents for this project.

#### 3.3. Study Approach

For this research, a quantitative study approach was used. The gathering of numerical data for statistical analysis is a necessary step in quantitative research. Participants in this research will complete a standardized questionnaire, and statistical methods will be used to evaluate the data to make objective and generalizable findings.

#### 3.4. Research Community

Various Saudi Arabian legal system stakeholders make up the study community for this study. Judges, attorneys, legal experts, and civilians will all take part. Their range of viewpoints is crucial for fully comprehending the ramifications of AI in the legal field. Judges will give insights from a judicial perspective, attorneys will offer insights from the perspective of a practicing attorney, legal academics will share their knowledge, and citizens will reflect the views of the general public. The study attempts to obtain a comprehensive perspective of the attitudes and views about AI in the judicial system by including a number of stakeholders.

#### 3.5. Sample Size and Sampling Methods

Stratified random sampling was used to guarantee a representative sample. Participants will be divided into subgroups according to their professional affiliations (judge, attorney, scholar, and citizen). To ensure proportional representation from each category, a random sample will be taken from each subgroup. This sampling method improves the results' validity and generalizability. There were 137 participants total in the study. Based on the idea of having enough statistical power to identify significant effects and group differences, the sample size was chosen. The research intends to provide solid and trustworthy insights on stakeholders' viewpoints on AI in the Saudi Arabian legal system with this sample size.

## 3.6. Study Tools

A structured questionnaire will be the main method used to gather data for this study. Four sections will make up the questionnaire. Age, gender, profession, and legal experience are just a few of the demographic factors that will be gathered in the first segment to characterize the sample. Agree, neutral, and disagree three-point Likert scales will be used in the following sections. The usage of Likert scales offers quantitative examination of stakeholders' attitudes and perceptions as well as simple analysis of their views.

#### 3.7. Procedure for Analysis

The right statistical techniques will be used to examine the data gathered via the questionnaire. The demographic data and participants' answers to the Likert scale questions will be summarized using descriptive statistics, such as frequencies and percentages. Statistical software will be used to conduct the analysis, assuring the validity and correctness of any conclusions drawn from the data. The study results will be presented in a concise and thorough way, answering the research questions and offering insightful information on the viewpoints of key players about AI in the Saudi Arabian legal system.

## 4. Results and Discussions

### 4.1. Results

The results of the collected data are presented in different sections, which are anchored by the study research questions

Category	Items	Repetition	Percentage
Gender -	Male	92	67.16
	Female	45	32.84
Occupation –	Judges	18	13.13
	Attorney	46	33.58
	Legal researcher	39	28.47
	AI enthusiast	35	25.54
Experience in Legal system in Saudi – Arabia –	1-4 years	29	21.17
	5-9 years	44	32.11
	10 years and above	64	46.72

Table 1: Result of the Demographic Variables.

The demographic variables indicate a generally distributed and encompassed study population. The table indicates that there are more male participants than the female, there are more attorneys in the study, followed by legal researchers, AI enthusiast, and the least are judges due to other factors that must be considered in recruiting judges to participate in the study. The table also indicates that more than 46% of the participants have been active participants and stakeholders in the Saudi Arabia legal system for over ten years.

# a. What are the Opinions and Perspectives of Critical Stakeholders on the Use of Artificial Intelligence (AI) in the Saudi Arabian Legal System?

There is a need to gain insights into the perception and acceptability of AI in the legal system in Saudi Arabia. This is the focus of the first research question, from which four questionnaire items were developed, and the findings are contained in table 2 below. 1710 Development of Computational Models of Legal Knowledge, Reasoning, and Decision Making; Exploring the ...

#### Table 2: Result of Question One.

Question Items	Agree	Neutral	Disagree	Mean	Std. Dev.
Artificial intelligence (AI)-enabled tools have the potential to enhance the decision-making process of judges by providing them with increased information and promoting objectivity in the resolution of intricate legal cases within the context of Saudi Arabia.	72.27	10.94	16.79	3.42	1.15
As a stakeholder within the Saudi Arabian legal system, it is my belief that artificial intelligence (AI) has the potential to enhance the expertise of legal professionals and contribute to the overall improvement of legal services.	78.1	6.57	15.33	3.63	1.19
In order to safeguard sensitive legal information, it is imperative to prioritize data privacy and security during the integration of artificial intelligence (AI) within the legal system.	94.17	3.65	2.18	5.06	0.52
The utilization of artificial intelligence (AI) within the legal system gives rise to apprehensions regarding the possible displacement of employment opportunities among legal professionals.	25.55	13.87	60.58	2.05	1.82

Table 2 offers insights into the views of the stakeholders that participated in the study. The focus has been to unveil the perception and attitude of the participants towards the integration of AI in the Saudi Arabian legal system. The majority of the participants express concerns over certain issues on the use of AI in decision making in the legal system. The findings are further contained in the discussion section.

b. What Ethical Issues, Especially those Involving Data Privacy, Transparency, Justice, and Accountability, have Stakeholders in Saudi Arabia Highlighted in Relation to the Deployment of AI in the Legal Sector?

 Table 3: Results of Research Question Two.

Question Items	Agree	Neutral	Disagree	Mean	Std. Dev.
The incorporation of artificial intelligence (AI) into the legal system in Saudi Arabia has elicited apprehensions regarding the possible exploitation or unauthorized retrieval of confidential legal data.	88.32	4.37	7.31	4.69	0.84
As a stakeholder, I think that the limited transparency of AI algorithms employed in legal decision-making processes, potentially impede comprehension of the rationale behind specific judgments.	73.72	13.13	13.15	3.51	1.06
The implementation of artificial intelligence (AI) within the legal domain prompts inquiries regarding the individuals or entities accountable for errors or biases present in AI-generated legal determinations.	81.76	2.91	15.33	4.28	0.98
The significance of ongoing monitoring and auditing of artificial intelligence (AI) systems within the legal domain to uphold fairness, transparency, and compliance with ethical principles is required.	93.43	2.19	4.38	5.08	0.52

Ethical concerns are prominent and necessary in the discussion of computational models of legal knowledge. It is important to gain insights from the stakeholders on their apprehension on the full integration of computational models, basically artificial intelligence systems, in legal proceedings and judicial decision-making processes. The table indicates that certain factors, which are further accounted for in the discussion, underpin the concerns of the stakeholders.

# c. What are the Main Elements that Affect Stakeholders' Acceptability and Readiness to Embrace AI-Powered Solutions in the Saudi Arabian Legal System?

There are factors that inform the acceptability of AI tools and systems in the legal system. The focus of the third research question is to gain insights from the stakeholders on the nature of certain factors that inform their acceptability of the automated decision-making system in judicial proceedings in Saudi Arabia. The results of the generated data are contained in the data below

Question Items	Agree	Neutral	Disagree	Mean	Std. Dev.
The effective incorporation of artificial intelligence (AI) into the legal system of Saudi Arabia necessitates the provision of adequate training and upskilling opportunities for legal professionals, enabling them to proficiently harness AI-powered solutions.	95.62	1.45	2.93	5.18	0.43
The level of stakeholders' preparedness to adopt artificial intelligence (AI) within the legal system is contingent upon their trust in the technology's capacity to improve efficiency and precision in legal procedures.	94.16	2.18	3.66	5.13	0.48
The degree of transparency and comprehensibility exhibited by AI algorithms plays a crucial role in influencing stakeholders' willingness to embrace AI-driven solutions within the legal field.	97.08	0.72	2.2	5.36	0.29
I have reservations regarding the potential compromise of human touch and empathy in certain legal matters due to the increasing dependence on AI in legal decision-making.	92.7	4.37	2.93	5.04	0.59

Table 4: Result of Research Question Three.

Different factors may motivate the stakeholders to accept the integration of artificial intelligence into legal proceedings and judicial decision-making processes. These factors are contained in table 4, and the results are also evident, indicating that the country must consider certain factors when they set to fully integrate AI models or computational systems in judicial proceedings and legal decision-making.

## 4.2. Discussion of Findings

The collected data has been presented in tables 2, 3 and 4 respectively, which basically anchor the three research questions for the study. The first research question seeks to unveil the perception of AI integration into legal decision-making and judicial proceeding by the stakeholders in the Saudi Arabian judicial system. The second research question generated concerns on certain ethical issues and gained insights of stakeholders on the concerns. The

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third research question seeks to understand the factors that informed the decision to accept the full integration of computational models or AI systems in judicial proceedings and legal decision-making in Saudi Arabia.

In table 2, it can be seen that 72.27% of the study population accepted that artificial intelligence (AI)-enabled tools have the potential to enhance the decision-making process of judges by providing them with increased information and promoting objectivity in the resolution of intricate legal cases within the context of Saudi Arabia. One of the core values of the legal system across the world is logical objectivism which promotes the neutrality of sentiment in legal decision-making. Although 16.79% rejected the claim, and 10.94% remained neutral, it is evident that a majority of the stakeholders that participated in the survey expressed positive perception of the integration of computational models in the Saudi Arabian judicial proceedings. Similarly, 78.1% of the stakeholders that participated in the study affirmed that as a stakeholder within the Saudi Arabian legal system, it is their belief that artificial intelligence (AI) has the potential to enhance the expertise of legal professionals and contribute to the overall improvement of legal services. This is more evident when 94.17% of the stakeholders agreed that in order to safeguard sensitive legal information, it is imperative to prioritize data privacy and security during the integration of artificial intelligence (AI) within the legal system. However, it is important to reiterate that over 60% of the stakeholder rejected the view that the utilization of artificial intelligence (AI) within the legal system gives rise to apprehensions regarding the possible displacement of employment opportunities among legal professionals. This indicates that the judges, the attorneys, the legal writers and the AI enthusiasts are not perturbed over the possible replacement of their works by computational models or AI systems. This finding is similar to Mustafa et al. (2020), who argued that legal reasoning and legal decision making are basic areas in the judicial proceedings that consistently requires human input despite the viability and advancement of artificial intelligence.

In table 3, it could be seen that over 88% of the stakeholders ghat participated in the study shared the view that the incorporation of artificial intelligence (AI) into the legal system in Saudi Arabia has elicited apprehensions regarding the possible exploitation or unauthorized retrieval of confidential legal data. the confidentiality of the legal document is an aspect of ethical concerns that have been at the forefront of the discussion of computational decisionmaking and AI in legal reasoning. According the findings of the study conducted by Hashim et al. (2020), it is difficult to entrust a computational program that is operated by humans with legal documents that ought not to be compromised at any time due to the implications. As such, data privacy remains a huge concern. This is similar to 73.72% of the stakeholders in the study who agreed that the limited transparency of AI algorithms employed in legal decisionmaking processes, potentially impede comprehension of the rationale behind specific judgments. It is not enough to produce legal decisions based on data retrieval system, it is more important to understand the processes and the considerations that inform certain legal decision. According to Lippi and Torroni (2019), the major in the integration of AI or computational models in legal decision-making and reasoning is the comprehension of the facets of judgements and decisions.

Furthermore, about 81.76% of the stakeholders affirm that the implementation of artificial intelligence (AI) within the legal domain prompts inquiries regarding the individuals or entities accountable for errors or biases present in AI-generated legal determinations. There is the question, if there are mistakes in legal decisions and legal reasonings processed by computational models, who should be held responsible for the errors. According to Aspiri and

Sarto (2019), possible errors and biases in legal decisions emanating from AI models may be challenging to be attributed to any human professional considering the fallible nature of the artificial intelligence models. As such, stakeholders that participated in the study showed concern on the issue of acceptability of errors or biases of legal decisions generated from AI models. In the same vein, almost 94% of the study population agreed that the significance of ongoing monitoring and auditing of artificial intelligence (AI) systems within the legal domain to uphold fairness, transparency, and compliance with ethical principles is required. This finding is similar to Hashim et al. (2020) who affirmed that there is a need to continuously monitor and audit AI databases for effective legal reasoning and decision-making.

In the 3, it could be seen that more than 95% of the stakeholders that participated in the study agreed that the effective incorporation of artificial intelligence (AI) into the legal system of Saudi Arabia necessitates the provision of adequate training and upskilling opportunities for legal professionals, enabling them to proficiently harness AI-powered solutions. According to the stakeholders, one factor that informs their acceptance of the system is the training of the professionals that handle the computational models, which involves a cross-sectional efforts from legal experts, legal researchers, and AI experts to build models that can offer legal reasoning and legal decision-making system. Also, about 94% of the study population agreed that the level of stakeholders' preparedness to adopt artificial intelligence (AI) within the legal system is contingent upon their trust in the technology's capacity to improve efficiency and precision in legal procedures. One reason the stakeholders accept the system is the perceived capacity to improve objectivity, delete biases in legal decision making, and incorporate adequate up-date information in each legal decision.

Furthermore, about 97.08% of the stakeholders that participated in the survey agreed that the degree of transparency and comprehensibility exhibited by AI algorithms plays a crucial role in influencing stakeholders' willingness to embrace AI-driven solutions within the legal field. Also, 92.7% of the participants accepted that they have reservations regarding the potential compromise of human touch and empathy in certain legal matters due to the increasing dependence on AI in legal decision-making. Overall, there are great factors that inform the acceptability of the computational models for legal decision-making and legal reasoning by the critical stakeholders in the Saudi legal system.

## 5. Conclusions

The integration of artificial intelligence and other computational models has become pervasive across a wide range of human activities, resulting in enhanced operational efficacy in professional endeavors. The integration of artificial intelligence (AI) into the legal system of numerous countries has been undertaken due to its substantial advantages in legal reasoning, decision-making, and the overall conduct of judicial proceedings. This study expounded on the Saudi Arabian legal system, focusing on the development and integration of computational models of legal reasoning and decision-making. The focus is to explore the acceptability of AI in the Saudi Arabian legal system, the ethical concerns, and the factors that can inform the acceptability of the computational models. The study involved the participation of 137 stakeholders, encompassing judges, attorneys, legal researchers, and AI enthusiasts. A quantitative research methodology was employed in this study, utilizing a cross-sectional design. Data was gathered by means of a questionnaire that was developed to address the research questions. The analysis was performed utilizing appropriate statistical methodologies. The findings demonstrate that a majority of the participants, specifically 72.27% of the study

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population, expressed their agreement with the notion that the utilization of artificial intelligence (AI)-enabled tools holds the capacity to improve the decision-making capabilities of judges. These tools are believed to offer judges access to a greater amount of information, thereby fostering objectivity in the resolution of complex legal cases, particularly within the specific context of Saudi Arabia. Nevertheless, a significant majority of stakeholders, approximately 81.76%, express concerns regarding the attribution of responsibility for errors or biases in AI-generated legal determinations when artificial intelligence (AI) is integrated into the legal domain. The issue at hand pertains to the allocation of responsibility in cases where computational models produce erroneous legal decisions and legal reasoning. The findings additionally demonstrate that a significant majority of the participants in the survey, specifically 97.08% of the stakeholders, expressed agreement regarding the importance of transparency and comprehensibility demonstrated by AI algorithms. This factor was identified as influential in shaping stakeholders' inclination to adopt AI-driven solutions within the legal domain. Therefore, it can be inferred that the acceptability of stakeholders regarding the efficiency of the system plays a significant role in determining the effectiveness of computational models in legal reasoning and decision-making.

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