

AI-Generated Evidence and the Future of Digital Justice: An Empirical Study of Legal Acceptance, Forensic Reliability, and Regulatory Challenges

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Research Article

Keywords: Artificial Intelligence, AI-Generated Evidence, Digital Justice, Digital Forensics, Legal Acceptance, Regulatory Governance, Cybercrime

Posted Date: October 13th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-11016126/v1>

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Additional Declarations: No competing interests reported.

Abstract

AI has revolutionized the way digital evidence is created, analyzed, and interpreted in criminal justice processes. Yet the use of AI-generated evidence brings significant concerns for the reliability of evidence, its acceptance in court, transparency, and regulatory oversight. While prior work has explored the technological advancements in digital forensics, there is a lack of empirical work that focuses on the acceptance and application of AI-related digital forensic evidence in judicial settings. This study seeks to fill this gap by exploring key factors that motivate uptake of AI-generated evidence and what this means for digital justice systems. The study builds on the Technology Acceptance Model and the Institutional Theory to create a framework that explains the legal acceptance and trust in AI supported justice processes by integrating AI evidence characteristics, perceived forensic reliability, and regulatory readiness. Survey data from legal practitioners, forensic practitioners and law enforcement are used, with a quantitative research design used. To test direct, mediating and moderating relationships among the research constructs, the proposed model is tested empirically using partial least squares structural equation modelling (PLS-SEM). The study will help to shape the developing field of AI governance, digital forensics, and technology-facilitated justice by offering an understanding of the socio-legal conditions needed for the responsible adoption of AI evidence. The results offer comprehensive recommendations and guidance for policymakers, judicial bodies and forensic bodies aiming to set up clear, reliable and ethically sound protocols for the handling of AI generated evidence in modern digital justice settings.

1. Introduction

1.1 Background of AI-Generated Evidence

Artificial Intelligence (AI) has revolutionized the production, interpretation and evaluation of digital information in modern societies. Artificial intelligence, and generative AI in particular, is now able to create realistic text, images, audio and video content that can reproduce human-generated artefacts with levels of fidelity not previously possible. These trends offer great potential for innovation, but also pose challenging issues for legal systems, such as the authenticity, reliability and admissibility of evidence created digitally. The rise of synthetic media, deepfakes and AI-generated content has raised concerns about how courts and investigative bodies will be able to identify whether the information is real or faked (Chesney & Citron, 2019).

Digital evidence has emerged as an integral part of today's criminal investigations, civil cases and regulatory cases. Unlike traditional physical evidence, digital evidence is subject to manipulation along its entire life cycle, is easily reproducible, and is dynamic. The rise of more sophisticated content creation with AI presents new challenges when it comes to current evidentiary protocols, since traditional methods of verification may no longer be enough to ensure authenticity and integrity (Casey, 2011). Therefore, justice institutions need to rethink their current practice of evidence assessment and integrate technological capacities, evidence validation mechanisms and regulatory protection.

In the past, digital forensics has been concerned with the discovery, collection, analysis, and reconstruction of electronic evidence. While the use of AI in evidence generation and forensic analysis adds another layer of complexity, however, where in evidence production, AI systems act as both creators and assessors of evidence. Systematic procedures are needed to ensure that digital evidence is reliable, transparent and reproducible and, in addition to the involved technical recovery processes, this is what makes the evidential value of digital evidence credible (Garfinkel, 2010). The importance of these requirements mushroomed in the realm of AI generated evidence as automated systems can potentially function with complex algorithms that are hard for lawyers to comprehend.

This has thus posed a double challenge to the justice systems: how to adapt and leverage the innovations of generative AI while maintaining the essential fairness, reliability, and accountability of the legal framework. On the other hand, AI can also streamline the writing of reports and analysis of vast amounts of data, which can be time-consuming and prone to errors. AI can also make the writing of reports and the analysis of large amounts of data easier and more accurate, which can be time-consuming and error-prone. However, uncertainty about algorithmic accountability, explainability, bias, and human oversight arise with the creation of AI-evidence (Jobin et al., 2019). This tension creates a need for analysis of technological capabilities as well as perceptions and acceptance by those who perform an evaluation of evidence in legal settings.

1.2 Upcoming Legal and Digital Challenges

Digital justice is a new idea that echoes the growing presence of information technologies in the legal institutions, judicial processes and mechanisms of dispute resolution. While digital transformation has enhanced access, efficiency and analytical power in justice systems, it has also created new governance issues around justice issues of fairness, transparency and procedural legitimacy (Susskind, 2019). In the era in which AI is integrated into judicial and investigative processes, issues of trust of technology and institutional acceptance are central to the future of digital justice.

A major issue with the use of AI-generated evidence is its legal admissibility. Generally, the principles used to assess evidence are those of relevance, authenticity, reliability and procedural fairness. But with the advent of AI-created artefacts, it becomes increasingly difficult to ascertain authorship, originality and modifications. The deepfake technologies show how synthetic content can produce images of individuals and events that are believable enough to impact investigations and judicial decision making, as well as public perceptions (Chesney & Citron, 2019).

As another major issue, there is a need to make AI systems explainable. In the past, legal decision making has been based on transparent reasoning, which allows parties to contest evidence and to get an understanding of the basis on which the legal decision is made. But, there are numerous AI systems which function with intricate machine learning procedures that may not be easily explainable. This dilemma has been led to conflicts between technology efficiency and legal accountability, as evidence produced or analyzed by such processes can undermine core concepts of "due process" (Doshi-Velez & Kim, 2017).

Additionally, the rules and regulations governing AI-generated evidence are still not standardized throughout the jurisdictions. However, while international organisations have established principles for the trustworthy and responsible use of artificial intelligence, there is a lack of mechanisms to put these principles into practice in the field of forensic and judicial applications (OECD, 2019). The allocation of accountability, data protection, algorithmic bias and professional responsibility are just some of the areas that need to be explored to develop suitable governance practices.

Therefore, the success of the future of AI-generated evidence hinges on the interplay of forensic trustworthiness, judicial trust in the process, and regulatory readiness. This is important to understand as justice systems need to consider technology and all the core values of justice (fairness, transparency, public trust).

1.3 Research Problem

While there has been growing interest in use of AI in the field of forensic science and legal technology, there has been little empirical research that focuses on the assessment of AI generated evidence in justice settings. The literature has largely been about the technical aspects, such as the detection of deep fakes, accuracy of algorithms and the vulnerabilities in cyber security, compared to the socio-legal factors that shape the professional reception of AI-generated evidence.

This research gap is crucial because the effectiveness of technologies is not necessarily sufficient for their adoption in legal institutions. The acceptance of evidence is based on the professional confidence, perceived reliability, regulatory legitimacy and readiness of institutions. Previous studies of the adoption of technology have shown that user perceptions play a significant role in the adoption of new technology within professional settings (Davis, 1989). But principles used for evidence generated by humans are not fully explored when applied to AI-generated evidence.

Furthermore, studies in digital forensic science have focused on evidence integrity and methodology reliability but there is a lack of studies that examine the technical characteristics' connection with legal acceptance. Because of the lack of empirical understanding, there is uncertainty on how the policy, training, and regulatory frameworks for justice institutions can be developed in relation to AI-assisted evidence management.

In view of this, the following main problem is raised in this research:

Despite the growing significance of AI generated evidence in the digital justice domain, the empirical evidence on the interplay between forensic reliability, legal acceptance and regulatory issues and how they impact responsible use of AI in legal settings is limited.

1.4 Research Objectives

- To investigate the effect of the characteristics of the AI evidence on the perceived forensic reliability.

- To explore the connection between the forensic value of AI evidence and its acceptance in the courts.
- To assess the impact of regulatory obstacles on using AI-generated evidence in justice systems.
- To create an empirical framework that elucidates the conditions for the responsible use of evidence created through AI in the process of digital justice.

1.5 Research Questions

RQ1: What are the implications for forensic reliability perceptions of characteristics of evidence produced by the AI?

RQ2: What is the impact of the perceived forensic reliability on legal acceptance of the evidence generated by AI?

RQ3: What are the impacts of regulatory issues on the implementation of AI-generated evidence in e-justice systems?

RQ4: What are the socio-technical conditions for responsible integration of evidence with AI?

1.6 Contribution of the study

This study has three important implications for the literature. First, it contributes to the field of digital justice studies by offering empirical evidence on professionals' acceptance of the AI-generated evidence from a practical standpoint in legal and forensic processes. Second, it provides a framework for evaluating the evidence provided by AI systems. Second, it offers a framework to assess the evidence offered by AI systems. This paper focuses on the relationships between technological reliability, professional trust and regulatory conditions, a topic that has not been fully explored in previous research.

Second, the study adds to the body of literature on AI governance, emphasizing the need for regulatory readiness to support ethical technology utilization. This study takes a socio-institutional perspective on the adoption of AI-generated evidence acceptance, viewing it as a legal, professional and governance process.

Thirdly, the study has implications for policy makers, judicial institutions and forensic organizations. The results could inform evidence standards, professional training and regulatory initiatives that will enable the use of AI in justice systems to be transparent and accountable, while also highlighting factors that increase or decrease confidence in the evidence AI generates.

In general, this study indicates that the use of AI-generated evidence is not just a technological advancement but a socio-legal change that necessitates the harmonization of forensic science, legal structures, and regulatory frameworks.

2. Literature Review and Theoretical Development

2.1 Artificial Intelligence (AI) in Digital Justice Systems.

As artificial intelligence (AI) becomes more prevalent in the legal and forensic landscape, evidence production, interpretation and evaluation are evolving in nature. Traditionally evidence systems were based on human made records, artefacts and digitally stored information which were generated by some identifiable processes. Generative AI technologies have ushered in an entirely new class of evidence, however, where algorithms generate believable digital content like text, images, audio and video. The change presents a radical rethinking of what is authentic, what is written by a author and what is considered to be reliable evidence (Chesney & Citron, 2019).

Unlike traditional digital evidence, there may be circumstances where it is unclear who created the evidence or how the evidence was created, which is the hallmark of AI-generated evidence. Traditional digital evidence is often about recovering existing electronic artefacts, whereas AI-generated evidence is based on algorithmic generation or manipulation of information. Casey (2011) has said that integrity is crucial for digital evidence to be reliable, which must be preserved during collection, storage, examination, and presentation of the evidence. AI-generated content can make the process challenging, though: The distinction between an actual event and a synthetic creation is harder to make with AI-made artefacts, necessitating extra verification processes.

All these have been heightened by recent advancements in generative AI. For instance, deepfake technologies can produce audiovisuals that are incredibly convincing false representations of real people, which can affect the course of court proceedings, opinion, and investigation. The deepfake phenomenon, however, as Chesney and Citron (2019) explain, poses a major socio-legal problem as it challenges elided statements about the authenticity and integrity of the image. Likewise, Westerlund (2019) emphasises that it is in the nature of synthetic media to be a source of misinformation and deception that demands greater institutional responses.

However, one should not think of AI only in terms of challenge to the justice system. AI technologies can be used to enhance forensic investigations by processing vast amounts of information, detecting anomalies, and performing automated analyses. Digital forensic investigators have become even more interested in machine-learning techniques, as they can be used to detect patterns in large and complex data sets that might be beyond human analyzing ability (Garfinkel, 2010). So, the question is not if AI should be integrated into the justice system, it's how institutions can create the right mechanisms for the responsible and trustworthy use of AI.

Previous studies have shown that capability to new technology is not the only factor in successful use of technology in professional contexts. Instead, acceptance relies on users' perceptions of usefulness, reliability, and on users' compatibility with institutional values (Davis, 1989). In justice systems, these considerations come into play especially when technology is used to process and handle cases, legal practitioners have to assess the legal processes rather than just the technological performance.

Therefore, there is still a need for research that investigates the relationship between the characteristics of AI evidence, forensic reliability, and legal acceptance.

2.2 Reliability and Evidence trustworthiness of digital media

The idea of digital forensic reliability is one of the most basic and important concepts in order to make digital evidence a relevant part of the justice process. In evidence applications to law, in addition to expectations of relevance, probative value, and completeness, there is a strong expectation of accuracy, integrity, transparency, and reproducibility. AI-generated evidence poses unique challenges compared to traditional evidence sources as algorithms can shape the generation and analysis of digital evidence.

Whether stakeholders believe in the underlying processes and their scientific defensibility is a key component of the forensic use of evidence. Garfinkel (2010) believes that digital forensic science must have uniform methods that can be applied to provide repeatability and validation of results. If these procedures would not have been in place, evidence produced using digital technology could be problems regarding credibility and acceptance in court room.

Explainability is a big issue with artificial intelligence forensic procedures. Even some of the more sophisticated AI models, including those based on some deep learning, work in a complicated way that non-technical users may not be able to explain. One of the key lessons from the research in this area is that explainability is crucial for creating trust in machine-learning systems because users need to be able to understand why automated decisions are made (Doshi-Velez, 2017). Within legal settings this is a concern that is of particular interest to identifying and determining decisions through clear reasoning and an open evaluation process.

Moreover, people's perceptions of reliability are affected by worries about algorithmic bias. The fact that AI systems are trained with historical data means they could yield biased results if the training data is biased. Justice, transparency and accountability are key factors in global concepts of AI ethics as noted by Jobin et al. (2019). The principles are particularly important in criminal justice settings where flawed evidence in assessment could impact upon the exercise of fundamental rights and procedural fairness.

Reliability, however, does not necessarily equal acceptance, legally. Forensic reliability relates to the legal acceptance based on institutional trust and/or professional confidence. AI systems can be assessed by technical performance by forensic experts, but can also be assessed by elements such as interpretability, procedural protections, and adherence to evidentiary standards by legal professionals. The difference underscores the need to consider AI evidence acceptance not just a technical problem, but a socio-technical phenomenon.

Based on this, the present study views the perceived forensic reliability as a key mechanism that determines the acceptance of AI-generated evidence characteristics in the legal realm. Hence, the present study focuses on the perceived forensic reliability as a key mechanism by which characteristics

of AI evidence affects the acceptance of evidence in the legal domain. With the professionals' acceptance of generating evidence that are accurate, transparent, and scientifically sound, there is a higher likelihood of their support in integrating the use of AI in the justice process. If AI-generated evidence is perceived as accurate, transparent, and scientifically sound, it is more likely to be embraced by the professionals and integrated into justice processes.

2.3 Legal Acceptance of Artificial Intelligence Evidence

Legal acceptance is the level of acceptance that judicial and legal communities show to evidence created with AI, as well as to AI professionals. While technological advances have made digital evidence more accessible, judicial systems demand a high level of reliability, accountability and procedural fairness and as a result, it is difficult for law to accept new technologies.

Both functional and institutional factors affect the adoption of emerging technologies in the legal environment. Davis (1989) theorized that perceived usefulness and perceived ease of use are key factors that affect individuals' willingness to use technological systems with his Technology Acceptance Model (TAM). The creation of TAM was within the field of information systems research, but a number of subsequent studies have shown that it is applicable to a wide range of professional settings where technology adoption relies on user perceptions and organizational factors.

For AI-generated evidence, perceived usefulness could be associated with how useful AI tools are in enhancing the efficiency of investigations, identifying manipulated content, and assisting in evidence analysis. But it may not be enough, as legal professionals need to be confident that the AI-generated evidence is up to a standard that can be expected in legal matters and will be held accountable for.

Institutional legitimacy is also of influence in legal acceptance. Institutional theory holds that in addition to technical efficiency, organisations take up practices because they are socially legitimate and also they fit in with the expectations of professionals (DiMaggio & Powell, 1983). As a result, courts or legal institutions could be permitted to accept evidence created by AI if appropriate regulatory framework, professional standards and validation systems exist.

The existing literature indicates that trust is one of the key elements of the technology mediated decision-making process. Lee and See (2004) say that users develop trust in automation when they believe the automated system is capable, predictable and reliable. In the context of legal settings, trust is even more important since judgments relating to evidence have immediate effects on decisions made in court and on people's rights.

While the use of AI and its related discussions in the legal field have grown in recent years, there are still relatively few empirical studies of how attorneys are using AI-generated evidence. Much of the existing literature focuses on ethical issues, legal principles, or technical means of detection, and limited studies have explored the assessment of AI evidence in real-world decision-making scenarios by legal actors. In this study, we tackle this gap by empirically analyzing the factors that influence evidence acceptance of AI.

2.4 Regulatory Challenges in AI-Based Evidence Management

For the use of AI-generated evidence to be implemented, there is a need for a regulatory framework that is able to manage the complexity of the technology, while maintaining core legal principles. Existing legal structures are mostly built to accommodate human-generated evidence, and are not necessarily suitable for challenges with algorithmically-generated information.

An important regulatory issue is the accountability issue. In the case of AI-generated evidence, it can be difficult to ascertain who is at fault if there are any mistakes. Accountability issues arise over who should be held responsible for the output of AI, whether it be the AI developer, forensic practitioners, institutions, or the user who uses the output of AI. Lack of clarity on accountability structures can hinder institutional interest in implementing an AI-based evidence system.

Transparency and explainability is another challenge. The European Commission's High-Level Expert Group on Artificial Intelligence (2019) also states that there is a need for transparency, human oversight and accountability in order to build trustworthy AI. These principles are especially pertinent to forensic applications because it is important that evidence evaluation is contestable and understandable.

Other regulatory issues are also related to data protection and privacy. Large volumes of data are typically needed for training and running AI systems, which could lead to the misuse of personal data. Data is often required in large quantities for training and running AI systems, which can introduce risk of misuse of personal data. According to Floridi et al (2018) the governance of AI needs to be a balance between technological progress and moral obligation and human values.

Additionally, there is uncertainty around standards for AI generated evidence due to regulatory fragmentation. Governance of AI may be different across jurisdictions, with regard to the acceptance of the evidence and the processes of the court. In this context, regulatory readiness is a critical factor that can affect the successful integration of AI technologies into legal institutions. Therefore, regulatory readiness is a critical factor that can impact the successful integration of AI technologies within legal institutions.

Thus, regulatory issues are not just regulatory barriers, but influences to institutional confidence and professional acceptance. The study suggests a regulatory readiness has an impact on the relationship between forensic reliability and legal acceptance as it is essential to provide conditions for governance of the responsible use of AI forensic evidence.

2.5 Theoretical Framework

Technology Acceptance Model (TAM)

A model that describes the factors people consider when deciding to accept and adopt technological innovations is the Technology Acceptance Model (TAM) designed by Davis (1989). The proposed model

suggests that perceived usefulness and perceived ease of use will shape attitudes towards technology use and eventual technology adoption.

In the scope of this research, TAM is used as a starting point to explore the understanding of legal and forensic professionals regarding AI generated evidence. Perceived usefulness refers to the impact of AI evidence on investigative and judicial procedures, while perceived reliability and transparency can shape trust in the outcomes of the technology.

Institutional Theory

Institutional Theory is the theory that relates the practices adopted by organizations to their legitimacy and social expectations and regulatory pressures (DiMaggio & Powell, 1983). In contrast to technological viewpoints, institutional theory acknowledges that institutional and professional norms and governance contexts shape adoption decisions.

In digital justice settings, the use of AI evidence is not solely about the technical viability, but also it requires institutional acceptance, regulation, and professional trust. Thus, when integrating TAM and Institutional Theory, it is possible to understand the acceptance of a new product by the user and institutional readiness in general.

Conceptual Model

AI Evidence Characteristics (Accuracy, Transparency, Explainability)

↓

Perceived Forensic Reliability

↓

Legal Acceptance of AI-Generated Evidence

↓

Digital Justice Effectiveness

Moderator: Regulatory Readiness

3. Methodology

3.1 Research Philosophy and Approach

This study is based on a positivist research philosophy, as it aims to study the relationships between measurable constructs related to the acceptance of evidence created with the aid of AI in digital justice settings in an objective manner. In the context of social science research, positivism is a philosophical

approach that believes social phenomena can be studied through observation and analysis of empirical evidence and statistics (Saunders et al., 2019). In keeping with this view, hypotheses are drawn from the theory and tested in a quantitative way.

This research takes deductive method, which is the process of transforming theoretical assumption obtained from Technology Acceptance Model (TAM) and Institutional Theory into measurable constructs and then tested in the field. A deductive design is suitable when the researcher's interest is to investigate if theoretically hypothesized relationships hold true in certain social settings (Bryman, 2016).

Considering the AI generated evidence is a modern socio-technical phenomenon that entails the interactions among technology, law and professional decision-making, a quantitative approach allows for systematic assessment of the mechanisms of acceptance by various stakeholder groups. This is in line with the previous technology adoption studies that consider behavioural and institutional factors that affect technology acceptance (Davis, 1989).

3.2 Research Design

This research is based on a cross-sectional quantitative research design to study factors that affect the acceptance of AI generated evidence in digital justice systems. The data was gathered at one time and gathered using a structured questionnaire that was administered to professionals who have experience in legal proceedings, forensic investigations and managing digital evidence.

Since the survey objective is to analyze perceptions, attitudes, and behavioural intentions of the professional groups, a survey methodology was chosen. Survey-based research is frequently used in IS and social science research for studying technology acceptance, technology trust, and patterns of institutional adoption (Hair et al., 2022).

The research framework explores the correlation between different aspects of AI evidence, its perceived reliability in the forensic context, legal acceptance, and readiness for regulation. The proposed model proposes that the perceived forensic reliability serves as a mediation variable between technological characteristics and legal acceptance, and regulatory readiness is investigated as a context variable that reinforces or weakens the relationship between perceived forensic reliability and legal acceptance.

3.3 Population and Sampling

Professionals who create, examine, evaluate, or regulate digital evidence (including those who teach about digital evidence) were the target population. That is, the respondents were comprised of legal practitioners, prosecutors, law-enforcement investigators, cybersecurity specialists and digital forensic specialists.

These professional groups were chosen as they are directly impacted by evidence generated by AI. Educators consider the admissibility of evidence, experts scrutinize the technical reliability, and investigators increasingly make use of digital tools in their investigations. Thus, it is necessary to acquire a multi-dimensional perspective on the acceptance of AI evidence from these groups.

The study topic is unique and a purposive sampling was used. Purposive sampling helps the researcher to choose the subjects who have the required knowledge and experience in the field of the study (Etikan et al., 2016). This method is especially appropriate for new technology studies when there is not a large number of people familiar with the topic.

Forty (400) valid responses were collected and used for final analysis. The sample size is higher than what is generally recommended for partial least squares structural equation modelling (PLS-SEM), which considers the complexity of the model, statistical power and the assumed effect size, and not solely the population size (Hair et al., 2022).

3.4 Data Collection Procedure

Eligible respondents were sent a structured, self-administered, electronic questionnaire. Electronic data collection was chosen for two reasons: (1) the participants were from geographically wide-spread professional fields, and (2) digital platforms offer easy access to technology-focused professional communities.

Participants were told the purpose of the study, that they were required to participate and that their participation was voluntary, they will be kept confidential, and their information collected will be used for academic purposes prior to completing the questionnaire. This was an anonymous study and personally identifiable information was not required.

The questionnaire had two sections. The first part was designed to gather information on the demographic of the participants such as their background, number of years working and their affiliations. Secondly, the measurement of the research constructs was done with previously validated scales, adapted to the context of AI-generated evidence and digital justice.

To ensure that the questionnaire was clearly understood, that the items could be interpreted and that the items were suitable for measuring the concept being assessed, a pilot test was performed prior to the full data collection. Some wording changes were made to ensure the technical terms used in AI-generated evidence were easily understood for respondents from various backgrounds.

3.5 Measurement Instrument Development

The instrument was developed after a thorough literature review in the field of AI adoption, digital forensics, technology acceptance, and AI governance. Construct validity was enhanced because the existing validated measurement scales were adapted rather than newly created. This also allowed for a comparison between the current study and previous research.

Multi-item scales were used to assess all constructs with a five-point Likert scale ranging from:

1 = Strongly Disagree

5 = Strongly Agree

The questionnaire items that were developed were:

Construct	Description	Measurement Basis
AI Evidence Characteristics	Perceived accuracy, transparency, and explainability of AI-generated evidence	AI trust and explainability literature
Perceived Forensic Reliability	Confidence regarding accuracy, integrity, and evidentiary trustworthiness	Digital forensic literature
Legal Acceptance	Willingness of legal professionals to accept AI-generated evidence	Technology acceptance literature
Regulatory Readiness	Perceived adequacy of governance, policies, and institutional safeguards	AI governance literature

3.6 Construct Operationalisation

AI Evidence Characteristics

AI evidence characteristics are perceptions of whether AI generated evidence is accurate, transparent, and interpretable for professional use. Transparency and accountability are recognized as key attributes that can affect the trustworthiness of AI systems in previous AI governance studies (Jobin et al., 2019).

Perceived Forensic Reliability

Perceived forensic reliability refers to respondents' confidence in the accuracy, integrity, and scientific validity of AI-generated evidence during the forensic process. The reliability of digital evidence requires proper validation protocols, methodological consistency and reproducibility (Garfinkel, 2010).

Legal Acceptance

Legal acceptance refers to professionals' levels of appropriateness and legitimacy of AI-generated evidence for judicial decision-making. This construct is adapted from technology acceptance literature, which finds that perceived usefulness and trust affect the choices people make to use a technology (Davis, 1989).

Regulatory Readiness

Regulatory readiness measures attitudes towards the extent to which legal institutions have policies, ethics, and governance in place to facilitate the use of AI evidence. The responsible use of AI has been the focus of a number of literature pieces, which underscore the importance of institutional responsibility and regulatory frameworks (Floridi et al., 2018).

3.7 Common Method Bias Assessment

Potential common method bias (CMB) was taken into account as data were obtained from a single questionnaire, and the data were collected from the same respondents. To follow the procedural

recommendations of the Podsakoff et al. (2003), a number of measures were taken.

To minimize evaluation apprehension, anonymity and confidentiality were ensured. Two, the questions in the questionnaire were clearly formulated and respondents were asked to give their honest opinions. Third, statistical evaluation took place in the process of data analysis.

Harman's single factor test was used to determine if one factor explained most of the variance in the set of measurement items. Moreover, the assessment of full collinearity was also taken into account as the variance inflation factor (VIF) values could shed light on the potential common method concerns in PLS-SEM analysis (Kock, 2015).

3.8 Data Analysis Procedure

Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to analyze the data collected in this study using SmartPLS software. The study aims to predict, develop theories and explore complex relationships with mediation and moderation effects, so the PLS-SEM approach was chosen (Hair et al., 2022).

The analysis was conducted in two steps: the measurement model was verified, and the structural model was evaluated.

Measurement Model Assessment

The measurement model was assessed by:

Internal Consistency Reliability

The following were used to evaluate the reliability:

- Cronbach's alpha (α)
- Composite reliability (CR)

Hair et al., (2022) state that values higher than 0.70 signify that it has acceptable reliability.

Convergent Validity

The following tests were used to explore convergent validity:

- Outer loadings
- The mean variance extracted (AVE) is given as:

AVE values greater than 0.50 are deemed as good convergent validity.

Discriminant Validity

Discriminant validity was assessed using:

- Heterotrait–Monotrait ratio (HTMT)

HTMT values less than the recommended thresholds suggest that constructs are empirically separate (Henseler et al., 2015).

Structural Model Assessment

The structural model was assessed using:

- Path coefficients (β)
- Bootstrapping significance testing
- t-values
- p-values
- Coefficient of determination (R^2)
- Effect size (f^2)
- Predictive relevance (Q^2)

The statistical significance of hypothesized relationships was determined by means of bootstrapping with 5,000 resamples.

The mediation model analysed was the indirect effect of the AI evidence characteristics on legal acceptance via forensic reliability.

4. Results

4.1 Respondent Profile

The Demographic Characteristics of Respondents are presented in Table 1 and Fig. 1, illustrates the demographic distribution of respondents.

Table 1
Demographic Characteristics of Respondents

Category		Frequency	Percentage (%)
Professional Background	Legal practitioners	145	36.25
	Digital forensic experts	92	23.00
	Law-enforcement investigators	103	25.75
	Cybersecurity professionals	60	15.00
Professional Experience	Less than 5 years	96	24.00
	5–10 years	142	35.50
	11–15 years	103	25.75
	More than 15 years	59	14.75
Educational Qualification	Bachelor's degree	118	29.50
	Master's degree	221	55.25
	Doctoral/professional qualification	61	15.25

4.2 Measurement Model Assessment

The measurement model was tested prior to the structural model. Reliability, convergent validity and discriminant validity were tested according to Hair et al. (2022).

4.2.1 Reliability and Convergent Validity

Cronbach's alpha, which is also referred to as composite reliability was used to determine the internal consistency reliability. All constructs achieved good reliability, as indicated by values above 0.70 as reported in Table 2. Also, the outer loadings were beyond the recommended level (0.70), and the values of average variance extracted (AVE) were above 0.50, which indicates the convergent validity of the study (Hair et al., 2022).

Table 2
Construct Reliability and Convergent Validity

Construct	Items	Outer Loading Range	Cronbach's Alpha	Composite Reliability	AVE
AI Evidence Characteristics	AEC1–AEC6	0.742–0.861	0.881	0.913	0.638
Perceived Forensic Reliability	PFR1–PFR5	0.756–0.874	0.889	0.919	0.694
Legal Acceptance	LA1–LA5	0.731–0.852	0.872	0.907	0.664
Regulatory Readiness	RR1–RR4	0.748–0.867	0.854	0.900	0.692

The findings indicate that all the measurement constructs had good internal consistency and convergent validity. The reliability and convergent validity results are graphically presented in Fig. 2.

4.2.2 Discriminant Validity Assessment

Heterotrait–Monotrait ratio (HTMT) was used to test the discriminant validity. Henseler et al. (2015) suggest that values of HTMT below 0.85 are considered satisfactory discriminant validity, and the results are provided in the Supplementary File as Table 1.

The numbers for all HTMT values were under the recommended value, meaning that each construct was a separate theoretical concept.

4.3 Structural Model Assessment

Reliability and validity of the measurement model were assessed followed by the assessment of the structural model. The analysis was based on the hypothesized relationships between AI evidence characteristics, forensic reliability, legal acceptance and regulatory readiness.

Path-coefficients, significance testing, coefficient of determination (R^2) and effect size (f^2) and predictive relevance (Q^2) were assessed in the model.

4.3.1 Direct Effects and Hypothesis Testing

The significance of structural relationships was ascertained by means of bootstrapping with 5000 resamples, and the structural model results and hypothesis testing outcomes are provided in the Supplementary File as Table 2.

AI evidence characteristics are shown to be significant to the perceptions of forensic reliability of the evidence. In addition, there is a strong positive correlation between forensic reliability and the acceptance of AI-generated evidence by the legal community.

The regulatory readiness appears to have a positive correlation with legal acceptance, indicating that appropriate governance structures increase trust in the use of evidence provided by AI.

4.3.2 Explanatory Power and Predictive Relevance

The R^2 values were used to assess the explanatory ability of the model, and the coefficient of determination and predictive relevance values are summarized in Table 3. Therefore, Fig. 3 presents the explanatory power and predictive relevance of the structural model.

Table 3
Coefficient of Determination and Predictive Relevance

Endogenous Construct	R ²	Q ²
Perceived Forensic Reliability	0.375	0.241
Legal Acceptance	0.584	0.362

The model accounts for 37.5% of the variance in perceived forensic reliability, and 58.4% of the variance in legal acceptance. Hair et al. (2022) considered these values as moderate level of explanatory power.

The positive Q^2 values confirm the predictive relevance of the model, and indicate that it is able to meaningfully predict the endogenous constructs.

4.4 Mediation Analysis

Bootstrapped indirect effects were used to evaluate the mediating role of perceived forensic reliability between each of the AI evidence characteristics and legal acceptance and the mediation analysis results are provided in the Supplementary File as Table 3.

The results show a significant mediation between the AI evidence characteristics and the legal acceptance of AI evidence by perceived forensic reliability. The results indicate that the acceptance is influenced by professionals' confidence in the forensic credibility of the technology, which is in turn dependent on the characteristics of the technology.

4.5 Moderation Analysis

The moderating effect of regulatory readiness on the relationship between forensic reliability and legal acceptance was assessed through an interaction term, and the moderation analysis results are provided in the Supplementary File as Table 4.

An increased level of preparedness for regulation at institutions will increase the likelihood that AI-generated evidence will be accepted by professionals because they have more confidence in the forensic reliability of the institution..

4.6 Common Method Bias Assessment

Full collinearity tests were used to evaluate potential common method bias. The variance inflation factor (VIF) values were also low, with all values being less than the recommended value of 3.3 (Kock, 2015), thus common method bias was unlikely to affect the results, The full collinearity assessment results are provided in Table 4.

Table 4
Full Collinearity Assessment

Construct	VIF
AI Evidence Characteristics	2.184
Perceived Forensic Reliability	2.471
Legal Acceptance	2.693
Regulatory Readiness	2.216

The results confirm that common method bias does not represent a significant concern in the dataset, and Fig. 4 demonstrates the full collinearity assessment results.

5. Discussion

5.1 Interpretation of Major Findings

This research explored the factors that could affect the acceptance of AI-generated evidence in digital justice systems, taking a technological, forensic and regulatory approach. The study proposed that the characteristics of AI evidence influence legal acceptance as perceived forensic reliability, and that regulatory readiness boosts institutional confidence in AI-supported justice processes. Drawing from the Technology Acceptance Model and Institutional Theory, this study posited that characteristics of AI evidence impact legal acceptance as perceived forensic reliability, whereas regulatory readiness fosters institutional trust in AI-supported justice processes.

The results show that AI evidence properties greatly improve perceived forensic reliability, suggesting that, in general, the characteristics of the evidence, including accuracy, transparency and explainability, are essential for building confidence in the evidence provided by AI. The results are in line with previous studies, which highlighted that trust in systems using AI relies on not only the system's performance, but also on users' understanding of the process of making algorithmic decisions (Jobin et al., 2019; Lee & See, 2004). In legal settings, where evidence interpretation demands responsibility and fairness, technology's reliability is a vital factor in gaining acceptance by the profession.

The findings of the study build upon past work in digital forensic science by showing there are significant associations between the characteristics of the AI evidence and forensic reliability. Previous research was mainly concerned with the technical aspects of digital evidence—acquisition, integrity protection and evidence examination—(Casey, 2011; Garfinkel, 2010). But the results in this study suggest a need to

consider a wider range of perceived reliability in the acceptance of AI evidence. This implies that forensic credibility is not only based on the technical accuracy of the processes but also on the trustworthiness, understandability, and transparency of professional users of the AI processes.

Moreover, the results indicate that the reliability of AI-generated evidence, as perceived by the participants, has a significant impact on its acceptance in court. The relationship holds true: When lawyers see the evidence stemming from AI as being reliable and scientifically defensible, they're more likely to accept it. Other studies on technology acceptance have indicated that perceived usefulness and trust are key mechanisms that help understand the technology acceptance decision (Davis, 1989). This study, however, takes this line of thinking a step further by showing how reliability, in the context of the law, is a necessary connection between the capabilities of technology and the acceptance of the institutions.

Perceived forensic reliability mediated the relationship between the adoption of AI technologies and the acceptance of these technologies in the justice system, which explained the importance of this factor. While AI-created evidence could offer more advanced analytical tools, it is not enough to be accepted by legal stakeholders solely because of a technological innovation. Rather, professionals need to be assured that the outputs of AI tools meet forensic requirements and that there is evidentiary integrity. This result aligns with the thesis that the adoption of AI in sensitive sectors is a function of the socio-technical dimension and not just the technological one (Floridi et al., 2018).

The results also show that regulatory readiness (RW) has a positive effect on legal acceptance of AI-generated evidence. This outcome underscores the significance of institutional governance processes when it comes to influencing confidence in new technologies. AI governance studies to date have highlighted the need to ensure transparency, accountability, human oversight and regulations in the adoption of AI responsibly (OECD, 2019). The new results broaden this view by showing that readiness to regulation can serve as an facilitating factor that promotes professional acceptance.

The discovery indicates that while even well-functioning AI systems could be adopted, they might need to overcome issues with regulatory uncertainty and inadequacy. On the other hand, good governance mechanisms offer institutional guarantees, minimise uncertainties around accountability, ethical risks and procedural legitimacy.

5.2 Theoretical Implications

The study is an extension of the Technology Acceptance Model, but it is applied to the new environment of AI-generated evidence. The focus of TAM research has been on the adoption of information systems in organizational settings (Davis, 1989). Legal environments are different from traditional technology adoption contexts, however, because they have to consider issues of legitimacy, fairness and societal implications when making an acceptance decision. Including the forensic reliability as a mediator, this study shows that the professional acceptance of AI evidence is not just a function of the perceived usefulness of the technology, but also of the level of trust in the quality of the evidence.

The study is important in relation to the Institutional Theory as it puts emphasis on the need of regulatory readiness in terms of technology adoption. According to institutional theory, organizational innovations follow norms of their professionals, regulations, and legitimacy needs (DiMaggio & Powell, 1983). The results corroborate this view because there are governance mechanisms that give institutional confidence as a precondition for legal acceptance of AI-generated evidence.

This research is a new addition to the digital forensic literature, going beyond merely technical considerations of evidence reliability. Forensic research in the past has focused on method, chain of custody and preservation of evidence (Casey, 2011). But when AI is integrated, there are other layers such as algorithmic transparency, explainability, and trust within the profession. The results point to the need to view forensic reliability as a technical as well as a social construct.

the study adds to the literature on AI governance by empirical evidence showing the facilitating role of regulation in responsible AI use. Existing AI governance frameworks often emphasize ethical principles such as transparency and accountability (Jobin et al., 2019). The aim of this study was to build on the above discussions and demonstrate the impact of regulatory preparedness on actual acceptance behavior of professional users.

5.3 Practical Implications

The report underscores the need for robust governance structures for AI-generated evidence on behalf of policymakers and regulatory bodies. The findings show the importance of establishing governance systems for AI-generated evidence for policymakers and regulatory authorities. Confidence among justice practitioners could be impacted by uncertainty about who is accountable, how to determine verification and how to confirm standards of admissibility. As such, the policy should include guidelines on how to verify evidence of AI, what documentation is required, and the responsibility for it.

The results indicate that professional training and institutional readiness are key to the successful adoption of AI in judicial institutions. Judges, prosecutors and legal practitioners need to be informed of the capabilities, and limits, of AI to ensure evidence is evaluated appropriately. Training programs should also emphasize ethical issues, standards and evidence, and the interpretation of AI-generated content.

Digital forensic organisations will particularly benefit from the insights about the need to create explainable and transparent systems with AI. The tools used in forensic analysis should give independent evaluator enough information on the data sources, analytical procedures, and confidence levels. These practices can aid in building professional trust and boost acceptance in court.

The findings suggest that for those developing AI technologies, simply designing a technology to perform well is not enough to make it a part of justice systems. It is essential to make systems explainable, well-documented and compliant with the laws when designing them. The solutions implemented with AI for forensic use need to include accountability provisions for human oversight.

5.4 Social Implications

The use of AI-generated evidence has the potential to impact broader trust in justice systems. Digital justice not only relies on the efficiency of digital technology, but also on the public's confidence in the justice system as a mechanism for decision-making that is fair, transparent, and accountable.

The lack of proper safeguards in the use of AI-generated evidence could lead to an erosion of trust in it due to potential for manipulation, bias, and unfair outcomes. Alternatively, responsible implementation with robust regulatory frameworks can improve the efficiency of investigations while maintaining procedures that adhere to the spirit of fairness and justice.

The results hence confirm the need for a balanced approach combining technological innovation with legal protection and ethical governance. AI should complement, not supplant, the logic and reasoning used by judges. While automation will play a crucial role, human oversight is crucial, as the intricate nature of justice systems requires interpretation of social context, rights, and ethical considerations which can't be fully captured by automated systems.

6. Conclusion

AI is a game-changer that has revolutionized today's justice system with its swift evolution. With the rapid evolution of AI, there is a lot of potential and risk in today's justice system. Although AI evidence can aid investigations, evidence analysis, and forensic processes, the challenges of reliability, transparency, and regulatory legitimacy need to be addressed in the integration of AI into legal proceedings. This study analyzed the role of the characteristics of AI evidence in legal acceptance, which are measured from the perspective of forensic reliability and the role of regulatory readiness in the process of AI adoption in digital justice settings.

The study was based on the Technology Acceptance Model and Institutional Theory, it developed a framework for the socio-technical conditions required for the adoption of responsible evidence produced by AI systems and tested it in an empirical way. The results show that the perceived accuracy, transparency, and explainability of technologies have significant effects on perceptions of forensicity. In addition, forensic reliability played a major role as a process by which the AI-generated evidence was accepted by the professionals.

The results also underscore the need for regulatory preparedness to support the integration of AI in the justice system. While technological reliability is a critical enabler for acceptance, there needs to be suitable institutional confidence (governance structures, accountability mechanisms, professional standards). Thus, the endorsement of AI-generated evidence should not be viewed solely from a technological perspective, but rather as part of a more complex and socio-legal dynamic involving technology, institutions, and professional judgments.

The research used a cross section design, as the data were collected once. While this is suitable for the study of relationships between the research constructs, longitudinal studies may offer a more nuanced

understanding of changes in attitudes towards the acceptance of AI-generated evidence over time as technologies and regulations develop.

The study uses perception-based measures that are self-reported based on questionnaires. Perceptions are crucial for grasping the technology acceptance, but future research could involve experimental designs, behavioural observations or real scenarios of the evaluation of evidence in courtrooms to provide further validation.

The study is directed towards the professionals who are the participants of the legal and forensic process. While these respondents offer useful information, other points of view could be explored in subsequent research, such as those of judicial administrators, technology developers and members of the public.

Last but not least, AI governance is implemented in different ways in various countries and legal systems. The results must be considered in the context of the studied institutions and further research should include comparative cross-national studies to explore the impact that different regulatory frameworks have on AI evidence use.

This study can be expanded by further research into evidence adoption in various legal systems through the use of AI. There could be valuable lessons in doing a comparison between the developed and developing legal systems as to how the maturity of the legal system affects the acceptance of technology.

Rather than focusing on generic examples of AI-generated content in general, further research might explore examples of AI-generated evidence including deep fake videos, synthetic audio, AI generated documents and automated forensic reports. Evidence can be of various types and can result in different degrees of acceptance challenges as the requirements for authenticity vary from one digital artefact to another.

Furthermore, qualitative methods such as interviewing judges, expert witnesses, and lawmakers could be used in future research to gain a deeper understanding of the concerns of professionals about the management of AI evidence. Mixed-method research designs may help to give better explanations of statistical relationships and cognitive experiences.

Explainable Artificial Intelligence (XAI) is another key area to be analyzed in Legal contexts. The understanding of how explainability mechanisms can be applied to judicial confidence will be crucial for the development of trustworthy digital justice systems, as these systems are becoming more complex. The understanding of how explainability mechanisms can be applied to judges' confidence will be essential in the development of trustworthy digital justice systems as they become more complex.

While artificial intelligence is the transformative opportunity of the modern justice system, a successful integration of AI requires more than just technological progress. There is a need for a future of digital justice that is both legally acceptable and forensic reliable, and is governed by regime. The study

concludes that professional trust and institutional preparedness play a pivotal role in the uptake of AI-generated evidence and underscores the need for human-centred, transparent, and accountable methods in implementing AI in the legal field.

Declarations

Funding Declaration

The authors received no financial support, grants, or funding from any public, commercial, or not-for-profit organization for the research, authorship, and/or publication of this article.

Ethics Declaration

Ethics approval:

This study was conducted in accordance with the ethical principles applicable to research involving human participants. The study involved an anonymous questionnaire-based survey, and no personally identifiable information was collected from the participants.

Informed consent:

Participation in the study was voluntary. All participants were informed about the purpose of the research, the confidentiality of their responses, and the academic use of the collected information. Consent was obtained from all participants prior to completing the questionnaire.

Ethical guidelines:

The study was conducted in accordance with the principles of responsible research conduct and the ethical guidelines for research involving human participants.

Competing Interest Declaration

The authors declare that they have no competing interests.

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Figures

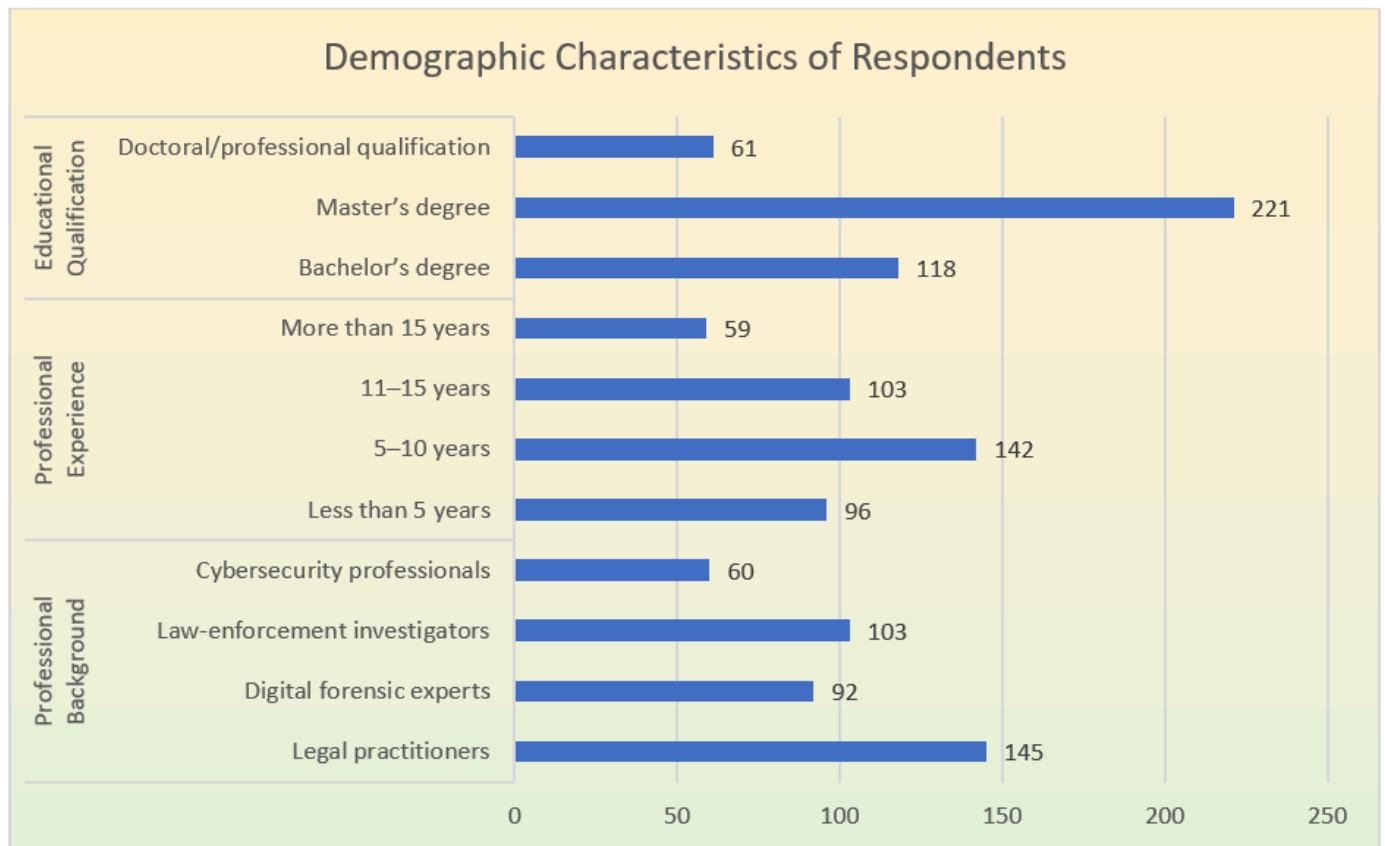


Figure 1

Demographic Characteristics of Respondents

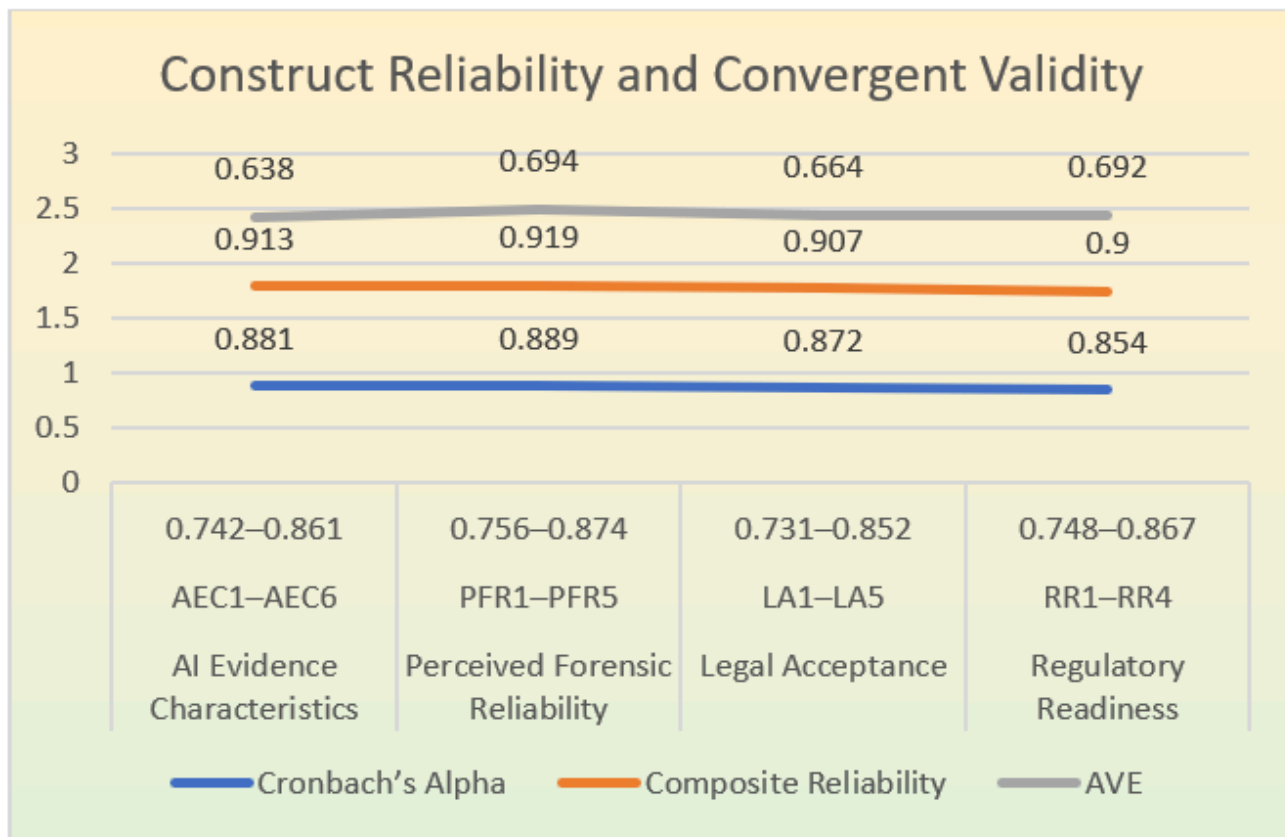


Figure 2

Construct Reliability and Convergent Validity

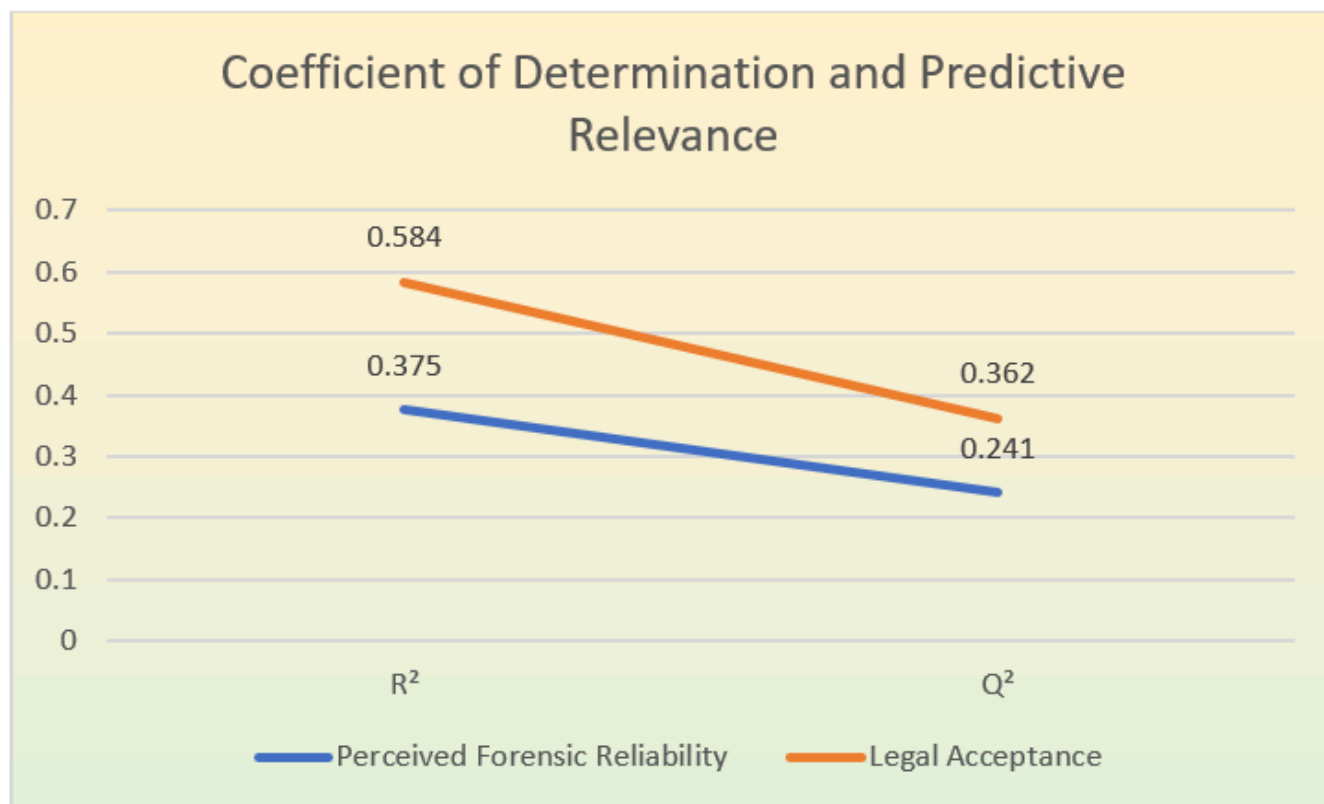


Figure 3

Coefficient of Determination and Predictive Relevance

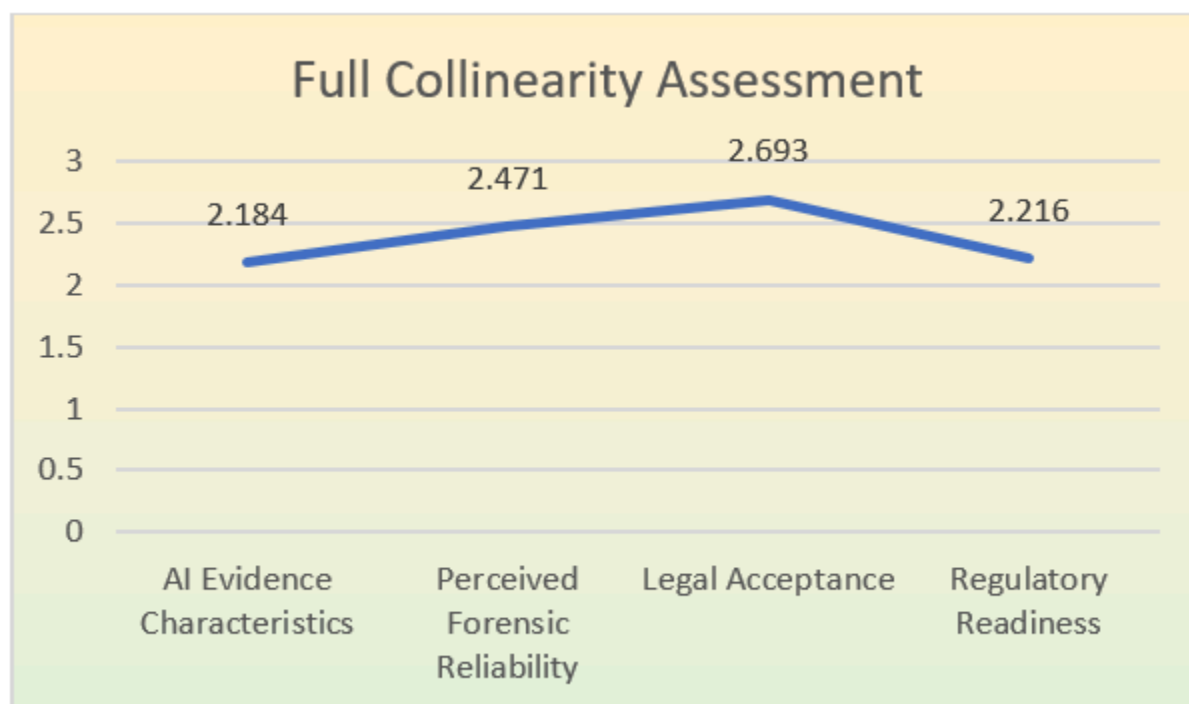


Figure 4

Supplementary Files

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- [SupplementaryData1.docx](#)