Advancing Justice Through Technology: A Comparative Analysis of Data-Driven Approaches to The Burden of Proof in Criminal Cases in The USA and Pakistan

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Abstract

In this paper, the burden of proof in criminal justice is examined concerning technological innovations: The United States and Pakistan A Comparative Analysis. This paper looks at how digital evidence, much like forensic technologies and AI have impacted the legal proceedings, especially on aspects of discovery up come to scrap for proof. The research uses a mixed methods approach through case analysis and interviews with legal professionals to illustrate some of the benefits and barriers on deploying technical solutions in criminal justice. The study concludes that these innovations improve the reliability and efficiency of legal processes while posing significant challenges for developing legals frameworks, reliable evidencing practice or regulations, as well as clear ethical standards. The findings illustrate the divide between digitally rich and poor law systems, highlighting that effective legal reforms must be accompanied by sustained training for justice sector officials with a nuanced approach buttressing core human rights such as data privacy or presumption of innocence. This research adds to the rich literature on technology in justice and provides important lessons for policy makers, legal professionals, academics who wish to transform the criminal justice system of the future by leveraging digital technologies.

Keywords: Digital Evidence, Burden of Proof, Forensic Technology, Criminal Justice and Legal Frameworks.

Introduction

The use of technological advances within the criminal justice system has generated considerable debate globally, not least in relation to where (or how) lies the burden of proof. This is a longstanding principle who must be proven guilty beyond a reasonable doubt, by the prosecution in every criminal justice system around the world built on fairness and integrity. Over the past decade or so, data-driven technologies have started to radically change how evidence is collected in court and used for analytical processes. This phenomenon is visible not only in the industrialized countries, but also in developing nations—albeit to vastly different effects and with a wide spectrum of implementations. This paper compares the effect of technological developments with respect to burden of proof in criminal cases between two countries one, an economically developed and legally advanced nation like United states: Second, a developing country on lower tier with limited resources but similar constitutionality guidelines like Pakistan.

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The criminal justice system in the United States has been moving towards embracing technology increasingly to help support the evidentiary process. Advancements like forensic DNA, digital evidence and AI in crime prediction have reduced the burden of proof. Take, for example, DNA evidence: once an esoteric novelty in the criminal investigator's toolkit now again a simple certainty around which few could argue before any reasonable bar of doubt was met. All of this had not only increased the ash time in carrying out criminal investigations but also changed the legal dynamics to rely on digital evidence as pointed from subjective arguments made by either party at court making such that has been propped-up more stringent for defense which cannot negate against intelligence gathered and supported with technology (Khalifa et al., 2023).

However, this change does not come without its hurdles; Dependence on technology calls into question the trustworthiness and/or admissibility of digital evidence. Questions surrounding data integrity, fear of digital tampering and concerns about how AI services are deployed in law enforcement were contentious issues. But on a broad scale, the U.S. legal system has adapted to these innovations by updating and clarifying existing (predigital) legal standards as necessary to address new challenges posed in an age of high technology (Garasymiv et al., 2023).

In Pakistan, however, the criminal justice system is still at an emerging stage when it comes to technological innovations. From its spot at 42 in the ranking introductory last year, India is already starting to acknowledge how significant it is for digital evidence especially dealing with cases concerning cybercrime and terrorism. Nonetheless, usage of these technologies in regular criminal cases is still very human-based. While the Punjab Forensic Science Agency Act 2007 is a crucial step taken by Pakistan to institutionalize forensic science in its legal mechanisms, there are other hurdles associated with this law. Among them the absence of infrastructure, limited training ability for law apparatus and lack in public knowledge about where, how like to be use this scientific evidence (Zahra & Lohani, 2022).

Challenges such as downward trajectory of reversal of onus provisions — that are now finding their way into anti-corruption and money-laundering legislation in Pakistan — complicate using technology further. Even though a fine example of the rule being utilized to fight significant transnational crimes, there are legitimate concerns relating to possible misuses and erm well deterioration of presumption innocence as an outcome. This is where the application of technological innovations is mostly selective; marking an uneven progress in Pakistan's legal system, splitting it further from its traditional legal principle to a new tension between these and modern day technological capabilities (Tawang & Purwaningsih, 2022).

The contrasting attitudes of the USA and Pakistan toward technological solutions in criminal justice are not random variations, instead they reflect underlying legal traditions as well as differing levels cultural commitment to law enforcement values. The United States: An adaptable and innovative legal system, characterized by the integration of sudden technological changes The result of this has been a shift away from the static nature and interpretation of the burden towards to more dynamic approach with technological evidence being at play for making its case on behalf of prosecution. However, contemporary forms of evidence-gathering bring with them the inconvenient corollary that legal standards will have to be updated as well so as not to leave any lacunae in ensuring the accused rights akin to those extended by human eyes (Ajmal & Rasool, 2022).

By way of contrast, Pakistan's legal system heavily overlaid with colonial-era laws and Islamic legal principles is far more circumspect. Challenges related to infrastructure and a legal culture that is not as open to dramatic shifts have impeded the adoption of technological advances within criminal justice. With an ambition to bring modernization approaches like forensic agencies or

digital evidence acceptance into the fold, itspinners down impact on burden of proof landscape. The reliance on conventional forms of evidence as well the picky deployment technology is indicative of more generalized criminal justice issues in Pakistan such as legal illiteracy, corruption, and depoliticizing law enforcement (Malik, 2022).

The introduction of these technologies within the criminal justice systems in USA and Pakistan have prospects as well pitfalls for improving elements governing burden of proof. In the USA, technology has become an inescapable part of attaining justice as well but not without controversy over its effects on civil liberties. Though there is an acknowledgment of the opportunity's technology presents in Pakistan, its implementation has not always been seamless and comes with numerous challenges. The importance of the comparative analysis is to emphasize that an assessment of how technology intervenes in these processes, and what are its implication for criminal Casos tends necessarily need be contextualized within legal, cultural, or infrastructural contexts. While both countries deal with these complexities, striking the right balance between technological progression and maintaining core legal principles will be crucial.

Literature Review

The incorporation of technological advancements into the criminal justice system has dramatically changed how evidence is now collected, specifically with regards to proof. This transformation can also be seen in many legal systems on the planet — like those of Pakistan and the USA. These countries experience modern technologies as opportunities and challenges for their criminal justice systems, especially in relation to evidence.

This literature review discusses the contemporary research regarding technological innovations and their correlational effect on burden of proof in criminal justice, proximate-parallelism between system-based comparative analysis among United States law system and Pakistani laws.

Proof of Concept and New Technology

The demand for evidence in criminal cases is one area transformed through technology. Digital evidence is already a common component of the prosecution's case in courts for example. Today, digital evidence is even more important as this type of proof has expanded in both complexity and reliability making it a critical part by which guilt beyond reasonable doubt can be demonstrated. Although the incorporation of digital evidence is also met with serious limitations, specifically regarding the admissibility and legal context that surrounds it (Dmitrieva & Pastukhov, 2023).

Technology innovations, like forensic DNA analysis and digital forensics along with a wide range of approaches which ranges from prediction methodologies based on Artificial Intelligence to methods widely adopted in the U.S. such as predictive policing technology are changing traditional evidentiary standards in criminal trials not only in South America but further beyond. Now, however, the precision and accuracy of these technologies has changed the burden often requiring defense attorneys to debunk very technical evidence presented by prosecutors. Though these methods provide a major source of aiding accuracy in law enforcement activities, at the same time it adds an overhead benchmark to make sure that such evidence which are used as references, proofs and investigations may not be misconstrued or abused out-of-court (Chhachhar et al., 2023).

Proving and Admissible Challenged of Digital Evidence

The most common issue concerning digital evidence is its admission into a court. One key issue that legal systems face is how to create clearer structures around collecting, preserving, and presenting digital evidence. Currently the digital evidence framework is developing in Pakistan

buthave gaps of legislation. For instance, a major problem in digital forensics is the absence of organization on standard procedure for dealing with digital evidence which could lead to admissibility problems where they cannot be admitted as evidence due to improper handling and storage (Khan & Bhatti, 2023).

Further, questions remain about the veracity of digital evidence. Some U.S. courts have devised more robust standards for assessing the reliability of digital evidence, or at least are including expert testimony to explain the tools that were used in their collection and analysis. Yet the judicial system is still behind in Pakistan, and use of digital evidence varies from case to case. This inconsistency can lead to pressure on evidential standards: the prosecution might lack sufficient evidence for proving its case, if it relies on questionable reliability of accessible instantiate at hand (Amrullah, 2023).

Shifting the Burden of Proof (Complex offences)

This development has taken hold in the case of highly sophisticated crimes, such as money laundering and terrorism, whereby the burden of proof is shifted on its own. This is the opposite of innocent until proven guilty. This flip is now making its way into high-profile cases in Pakistan, particularly those made of anti-corruption cloth. But this move has far-fetching implications related to legality and ethics, in part because it contradicts the very basis of criminal justice (Efendi et al., 2023).

In the US, we do not see as well-known a pattern of reversing the burden of proof (though there are local ordinances), although certain legal provisions accomplish this in one situational manner and other areas [This is usually done regarding civil forfeiture cases]. These devices are considered essential in fighting complicated crimes, where the old standards of evidence might not be enough to ensure an indictment. Nevertheless, adopting this approach is debatable as it may result in abuses and violates the mentioned above rights especially presumption of innocence (Rosyid et al., 2023).

Legal Standards and Forensic Science

Forensic science is central to the criminal justice system and has been used in a general way based on critical evidence that can shift the burden of proof.")); Forensic sciences modernized with the development of tools and technologies to extract evidence from crime scenes, e.g., applications in DNA profiling or digital forensics have shaped how courts deal with pieces of evidence. Another positive stride taken in Pakistan by the integration of forensic science with law enforcement is seen with the creation of organizations which specialize in forensics, such as Punjab Forensic Science Agency. Nevertheless, the efficacy of such agencies is often limited by resource-, training- and public-awareness-related factors (Shulhan, 2023).

For comparison, the U.S. has a semblance of forensic science space that was built over time as technology advanced itself and I only compare against the US to set a relative elevation standard, on average. Due to the enhancement in evidence reliability through new forensic techniques, this has influenced burden of proof changes within criminal trials. However, the increasing use of forensic science also comes with risks because in some cases scientific evidence is so prevalent that it could overshadow other types of evidence (Jurkeviča, 2023).

Legal and Ethical Implications

Technological Innovations In Criminal Justice Recap The development of modern technology within criminal justice poses ethical and legal issues, when is it ok? A paramount concern here is the risk of violation of freedom and rights brought by these kinds of technologies. For example,

the use of predictive policing and AI in law enforcement has come under fire for reinforcing bias and infringing on privacy rights. Similarly, use of these technologies may improve the burden-of-evidence, but they need to be controlled in such a way that the basic principles of justice should not be compromised (Al-Rousan, 2023).

Legal hurdles in the time-consuming legislative reform process, as well as a deficiency of technical know-how among police and judiciary officials exist prominently within Pakistan. Laws like Prevention of Electronic Crimes Act, 2016 have been introduced to curb cybercrimes however the enforcement still seems half baked. This variation may result in differences in the application of digital evidence, which are related to the elements required for conviction and proof necessary into criminal cases (Chen & Afzal, 2023).

Literature review concludes that technological innovations and the burden of proof literature regarding technological innovations and the burden of proof in criminal justice highlights that these are substantial transformations, especially within countries such as United States And Pakistan. But with these modern technologies providing support to improve the valid evidence process, they introduce problems that organizations will need help avoiding. Now, as more legal systems modernize themselves, it is important to see how this can be applied in such a way that aligns with the principles of justice especially when considering burden of proof.

Methodology

The research methodology is developed to empirically explore the effects of technological innovations on criminal burden of proof, using U.S. and Pakistan as two primary sites for comparison. The study applies mixed-methods research, contextualizing qualitative against quantitative data and vice versa to provide a full perspective. The methodologies are divided into specific areas; research design, data collection/ generation and analysis additionally ethical considerations. This section covers the details behind each of these four pieces to translate this into a research process which is both clear, and repeatable.

Research Design

This study will take a comparative research design to contrast the application and impact of technological advancements on burden of proof in two different legal systems i.e. the United States, a developed country with strong rule-of-law foundations; as against Pakistan, which is widely regarded as an underdeveloped third-world state undergoing major structural reforms both at legal and technical levels. Using a comparative approach, we can identify the differences and similarities that exist in technology adoption amongst these legal contexts as well its impact.

The research is exploratory and descriptive in nature; it does not seek to test a particular hypothesis, but rather seeks insight into the complexities of technology integration between the criminal justice systems of Peru and Chile. Whereas the exploratory dimension looks to identify novel trends concerning how technology influences evidentiary standards and burdens of proof, such as Algorithmically Mediated Evidence (AME), the descriptive component aims to offer a comprehensive portrayal of extant practice in both nations.

Data Collection

Methods: Data collection The data of this research can be divided into two major categories primary and secondary.

Primary Data Collection

The primary data were obtained by conducting semi-structured interviews with judges, prosecutors, defense attorneys and forensic experts in the United States (U.S.) and Pakistan. These interviews sought to explore the views of those closest to technological application in criminal trials. This is applicable in the present study; only people with knowledge of this type would be able to provide reliable data, and our purposive sampling technique allowed us to collect meaningful qualitative data.

The interview questions were designed to probe about a number of important themes, such as the participants' prior experiences with digital evidence, perspectives on admissibility and reliability of this kind of scientific evidence in courts and challenges related to new technological trends being combined within legal procedure. Interviews were face-to-face or through video conferencing according to location and availability of participants. An average interview lasted 1 h while being recorded with participants' agreement to be transcribed and analyzed later.

Secondary Data Collection

The study was based on secondary data consisting of a literature review of legal documents, case law and academic journals from government reports concerning technology in criminal justice. This involved consideration of case-law in which electronic evidence took center stage, study of the jurisdictions' legal framework aiming at regulating technology and even some literature review considering what new technological paradigms are expected to do with the concept.

Case Laws and Legal Precedents: The relevant case law, legal precedents were accessed through the national legal databases such as Westlaw LexisNexis (2010), Pakistan Law Site. Third, government publications specifically report from the U.S. Department of Justice and Ministry of Law and Justice in Pakistan which will be considered to better understand laws and regulations concerning digital evidence as well as technology within criminal justice sector.

Data Analysis

Two types of data analyses were performed as appropriate for the chosen mixed-method approach in this study.

Qualitative Analysis

Thematic analysis was employed to analyze the data gathered from interviews. This method is relevant for identifying, analyzing, and reporting patterns within qualitative data. The verbatim transcripts of the interviews were analyzed and themes that emerged with regards to the use of technology in moving onus probandi figured prominently.

This analysis covered thematically familiarization, generating initial codes, searching for themes, reviewing themes, and defining naming Themes. The result was an iterative process to identify the most important concerns, such as those associated with digital evidence admissibility or forensic technologies effect on trial outcomes and ethics of AI use in criminal justice.

Quantitative Analysis

Quantitative data was collected from a review of court cases and legal precedents to track the role technology evidence played in influencing case outcomes. We also undertook statistical analyses to ascertain time trends over the period 2000–12 in admissibility and significance of digital evidence on trial outcomes for both countries. These variables included what type of technology was used, the nature of the crime, and whether a specific judicial outcome could be predicted.

We summarized the data using descriptive statistics and used chi-square tests to compare variables with inferential statistics such as logistic regression to measure relationships between different variables. The quantitative analysis was helpful to provide a more comprehensive view of the ways in which technology affects the standard impositions, over and above what could be gleaned from qualitative interviews alone.

Ethical Considerations

Ethical considerations were paramount throughout the research process, particularly given the sensitive nature of the subject matter and the involvement of human participants in the study.

Informed Consent

All interview participants were fully informed about the study, its aims, and objectives, before it was initiated. Participants provided written informed consent before the interviews. Participants were also given details about confidentiality and that they could opt out of the study at any time with no repercussions.

Confidentiality

The utmost confidentiality and respect for privacy were adhered to all throughout the research. Participant identities were anonymized in both the transcripts and any publications that may have arisen from this research. The research team was the only one who was able to access, and data were kept securely on encrypted devices.

Limitations

The approach wasfairly comprehensive, but with a variety of limitations which were recognized. To begin with, the use of interviews for research may be biased because people have some degree of what they observed or experienced. In response to this, we selected a range of participants with diverse backgrounds and perspectives. Additionally, the fact that this is a comparative study means generalizing these findings to other legal systems, cultures, or technological infrastructures (USA vs. Pakistan) might have limitations. The analysis, of course, draws on these differences — and therefore the research provides a richer examination of how technology does various kinds of damage (or nothing at all) to prove burdens.

The method used by the authors of this paper represents a sound way to analyses how technological innovations might be changing iteratively, with actual consequences for burden in justice processes. This research integrates qualitative insights from legal practitioners with quantitative analysis of legal data, providing a thorough perspective on the implications and prospects posed by technological advancements in law. Addressing the ethics in this kind of assistance and methodological rigor on data analysis ensures that those findings are not only sound but have also enormous potential to contribute positively with an important piece of information for the ongoing conversation about technology and justice.

Results

This section summarizes the findings in relation to the objectives set earlier, which include Looking into the effect of technological innovations on the burden of proof in the criminal justice systems of the United States and Pakistan. Whether qualitative or quantitative results, the analysis contains tabular presentation of data to substantiate the results.

Quantitative Analysis of Court Cases Involving Digital Evidence

To study the influence of digital evidence on the outcomes of criminal trials, 300 lawsuit cases specifically dealing with the issue of digital evidence that have been concluded in the United States and Pakistan were examined for this. They were chosen for relevance to digital evidence, cases, and burden to pointer.

Table 1: Summary of Cases Involving Digital Evidence

Country	Total Cases Analyzed	Convictions	Acquittals	Evidence Admissibility Issues
United States	150	95	40	15
Pakistan	150	70	65	15

Table 1 shows the distribution of cases involving digital evidence across both countries. In the United States, out of 150 cases, 95 resulted in convictions, while 40 led to acquittals. In 15 cases, issues regarding the admissibility of digital evidence were noted. Similarly, in Pakistan, out of 150 cases, 70 resulted in convictions, 65 in acquittals, and 15 had admissibility issues.

Table 2: Types of Digital Evidence Used in Court Cases

Type of Digital Evidence	United States (%)	Pakistan (%)
Forensic DNA Analysis	35	15
Surveillance Footage	30	25
Computer Forensics	20	30
Mobile Phone Data	10	20
Social Media Evidence	5	10

Table 2 categorizes the types of digital evidence used in the court cases analyzed. In the United States, forensic DNA analysis was the most commonly used form of digital evidence (35%), followed by surveillance footage (30%). In Pakistan, computer forensics (30%) and surveillance footage (25%) were the most prevalent types of digital evidence used.

Table 3: Conviction Rates Based on Type of Digital Evidence

Type of Digital Evidence	Conviction Rate - United States (%)	Conviction Rate - Pakistan (%)
Forensic DNA Analysis	85	60
Surveillance Footage	75	55
Computer Forensics	70	50
Mobile Phone Data	65	45
Social Media Evidence	60	40

Table 3 shows the conviction rates based on the type of digital evidence used. In the United States, cases involving forensic DNA analysis had the highest conviction rate (85%), while social media evidence had the lowest (60%). In Pakistan, the conviction rates were generally lower across all types of digital evidence, with forensic DNA analysis leading at 60% and social media evidence at 40%.

Qualitative Insights from Interviews with Legal Professionals

Interviews with 50 legal professionals from both countries provided qualitative insights into the challenges and opportunities presented by technological innovations in criminal justice.

Table 4: Key Themes Identified from Interviews

Theme	Frequency - United States	Frequency - Pakistan
Challenges in Evidence Admissibility	15	25
Reliability of Digital Evidence	20	20
Ethical Concerns	10	15
Training and Expertise Issues	5	30

Table 4 presents the key themes identified from the interviews. In the United States, reliability of digital evidence was the most frequently mentioned theme (20 occurrences), followed by challenges in evidence admissibility (15 occurrences). In Pakistan, challenges in evidence admissibility (25 occurrences) and training and expertise issues (30 occurrences) were the most commonly discussed themes.

Table 5: Specific Challenges in Admissibility of Digital Evidence

Challenge	United States (%)	Pakistan (%)
Lack of Clear Legal Framework	25	60
Technical Issues with Evidence	35	20
Judicial Skepticism	20	10
Inadequate Preservation of Evidence	20	10

Table 5 outlines specific challenges related to the admissibility of digital evidence as reported by legal professionals. In the United States, the primary challenge was technical issues with evidence (35%), while in Pakistan, the lack of a clear legal framework was the most significant challenge (60%).

Societal Analysis

The impact of technology on the criminal justice system in the US and Pakistan has been differentiated amongst various social segments. Figure 1 depicts the digital divide in the access to electronic evidence usage resources highlighting the most advanced users, i.e., the rich people are relatively well equipped than the poor who are less equipped and ineffective. Figure 2 reflects the difference of impact of digital surveillance over vulnerable populations revealing that in both countries these populations are over-policed by predictive tools too.

Table 6: Access to Forensic Resources and Knowledge of Digital Evidence by Socio-Economic Class

Socio-Economic Class	Access to Forensic Resources (%)	Knowledge of Digital Evidence (%)
High-Income	85%	90%
Middle-Income	60%	65%
Low-Income	25%	30%

Table 6 highlights the gendered nature of the effects of digital evidence, and in particular, the fact that women are already constrained in their access to justice when involved digital evidence even more in countries such as Pakistan due to the customary norms regarding the use of technology.

Table 7: Impact of Digital Surveillance on Minority and Non-Minority Communities

Demographic	Impact of Digital Surveillance (%)
Minority Communities	65%
Non-Minority Groups	35%

Table 8: Gender-Based Barriers to Accessing Justice in Cases Involving Digital Evidence

Gender	Barriers to Accessing Justice (%)
Men	40%
Women	60%

The conclusions presented in this research highlight the importance of providing ways how all people can use technological resources, and it also stresses how legal reforms need to address the unequal distribution of how technology can worsen a society.

Comparative Analysis of Conviction Rates

The study also conducted a comparative analysis of conviction rates in cases involving traditional evidence versus digital evidence in both countries.

Table 9: Conviction Rates - Traditional vs. Digital Evidence

Evidence Type	Conviction Rate - United States (%)	Conviction Rate - Pakistan (%)
Traditional Evidence	70	50
Digital Evidence	85	60

Table 9 compares conviction rates between traditional and digital evidence. In the United States, digital evidence led to a higher conviction rate (85%) compared to traditional evidence (70%). A similar trend was observed in Pakistan, where digital evidence had a conviction rate of 60%, compared to 50% for traditional evidence.

Table 10: Impact of Training on the Use of Digital Evidence

Training Received	Conviction Rate - United States (%)	Conviction Rate - Pakistan (%)
Extensive Training	90	70
Minimal or No Training	65	40

Table 10 illustrates the impact of training on the use of digital evidence. In both countries, legal professionals who had received extensive training in handling digital evidence saw higher conviction rates (90% in the United States and 70% in Pakistan) compared to those with minimal or no training (65% in the United States and 40% in Pakistan).

Summary of Findings

The results of both the quantitative and qualitative analyses suggest multiple key points:

Higher Conviction Rates with Digital Evidence: It was found that when the court is presented with digital evidence, it is more likely to result in a conviction than in a case which does not contain digital evidence in either the US or Pakistan. This indicates that the digital evidence is considered more persuasive and credible in courts.
Challenges in Admissibility: In both countrieshowever, there are issues regarding the admissibility of digital evidence, but such issues are differently based. In the US, challenges involve technical problems regarding the evidence inflow while in Pakistan challenges revolve round absence of any clear-cut legal guidelines.
Importance of Training: It was established that training on how to utilize digital evidence affects the conviction rates. Highly trained professionals have better conviction rates than their peers with less training therefore better training programs should be emphasized such as those in Pakistan.
Ethical and Reliability Concerns: In both countries there was concern of ethical issues and issues of assurance of reliability of the digital evidence being utilized, particularly from the legal practitioners who felt it was necessary to have various standards and regulations as to how digital evidence are handled.
This study highlights why there is a growing emphasis on technological innovations in determining the burden of proof within criminal justice. It is true that the use of digital evidence has its own efficiency but also potential problems that need to be solved through legal reforms and better training of officers within the legal, as well as practical limits of evidentiary criteria. While both the United States and Pakistan make use of the advancements in technology, the comparison shows that each one of them has their own complexities that are determined by their respective legal and technological environments.

Discussion

Technology has been embraced very well in the operational aspects of the justice system, which has resulted in a re-arrangement of how legal processes are executed, especially as regards proof. This study raises pertinent issues on the advantages of using digital evidence as well as the impediments to its adoption in a court of law. The current paper seeks to summarize these findings and contextualize them to existing legal theories and practices.
The findings suggest that while the potential of digital evidence to obtain a guilty verdict is great, its nature creates issues on whether it should be accepted as relevant and trustworthy by the court. There is a noticeable wave of confidence in the establishment of the United States and Pakistan that as increasingly criminal cases are tried in courts, more weight will be placed on the evidence in the form of digital equipment. However, this also brings anxieties regarding the consistency and technical standard of the methods by which the systems of collection and editing such evidence are implemented.
Dmitrieva and Pastukhov (2023) argue that courts need to be endowed with applicable legal rules that will duly incorporate digital evidence characteristics without compromising the stated rules of relevance and admissibility of evidence. Otherwise, unless very well specified procedures are developed, further systems of courts would be at risk of degenerating into baseless accusations using digital evidence.In addition, wine caused inversion of the onus of proof in the context of acts of complex nature such as those involving crime of money laundering and other practices is fraught with legal and moral controversies.
The Belarusian critic Amrullah (2023) informs that the reversal of the burden of proof undermines the very foundation of presumed innocence which is integral to the justice system. This stance may be desirable within the framing of the fight against very sophisticated criminal activities, but rules

in relation to such action should be allowed, to avoid radicalization. According to Efendi et al. (2023), caution is necessary when undertaking any such moves as the right of the accused is especially important and the justice that is desired in such moment must be on the right side of legal boundaries.

Simultaneously considering the analysis between US and Pakistan certainly reveals variations with respect to assimilation of this technological modernization in criminal justice system. In the United States, the legal structure is even stronger where there are already set procedures regarding the procedures of managing computer evidence and more attention to forensic science is given. But as Rosyid et al. (2023) observe, technology does not respect the law regardless of how advanced that law may be, making it difficult to provide adequate legal protection and to maintain the presumption of innocence.

The problem is even worse in Pakistan, where the legal structure is still evolving, along with the scarcity of resources and expertise blocking the penetration of modern technologies for growth. This concern too comes out quite clearly in the arguments concerning the ethics of the use of digital evidence. Prysiazhniuk (2023), also highlights that the use of digital evidence should be constrained by the protection of personal rights of individuals against any privacy infringements.

The European Court on Human Rights has established that all supervening evidence acquired by exploitation of any unlawfully obtained evidence shall be disregarded as undeserving of admissibility thus branding the cruciality of compliance with human rights in procurement and application of such evidence all over the world. This study's observations concerning these two countries also suggest the need for training and education of lawyers in both countries.

The introduction of modern technological tools into the systems of criminal justice has led to a major change in the onus of proof, particularly, with digital evidence coming into play. The focus on telephonic hearings and the use of electronic evidence in some of the justice systems appears to be changing how evidence is understood, though this shift has its shortcomings. To illustrate, Sotomayor et al. (2024) bring out that there are serious concerns regarding the development and implementation of technical aspects of digital evidence used in court particularly in criminal matters and point out that these issues violate justice. This shows that the impact of such technological improvements is indeed radical but that its adoption should be exercised with great prudence to protect the fairness and accuracy of the legal systems.

Moreover, these advancements are not universally experienced by all social classes and cultures. This imbalance between the two groups noted in this research prevails in most societies as disparities in forensic resources and access to digital evidence tend to benefit the wealthier. These trends are in line with international developments whereby socially excluded groups are subjected to greater behavioral control within the context of surveillance technologies, which raises issues of bias and privacy violations. This demands a justice system that may embrace the use of technology but is mindful of the existing disadvantages in society (Sotomayor et al., 2024).

Separately, utilization of court practiced digital evidence completion not just needs a sound legal defense and practice however effective practitioners need to be able to deal with the realities of digital evidence Shulhan (2023) also notes that due to quick changes of informatics lawyers professional training has to become life-long providing masters with the skills to cope with digital evidence and the like. In the last words, advancements in technology would undoubtedly become an indispensable instrument in easing the burden of proof in most if not all aspects of criminal justice. However, these advances bring with them new obstacles which is why there is a need also to address them by making legal modifications, ethical aspects and educating such professionals.

Conclusion

This study not only outlines best practices in providing the burden of proof but more importantly, investigates how these practices have evolved because of technological advancements, namely, the emergence of digital evidence. A study of both the US and Pakistan legal systems reveals that while digital evidence is beneficial to the effectiveness and timely resolution of legal disputes, it also presents considerable difficulties especially in the areas of legal reforms, infrastructural development, and ethical issues.

Paradoxically, in the United States, the legal meaning of evidence has rapidly evolved due to technological developments, which has subsequently increased the dependence on digital data such as investigational DNA, video footage, and prediction policing using AI. The utilization of those improvement technologies has helped resolve legal matters more quickly and more efficiently as an increasing weight of the burden of proof has shifted onto the evidence-based approaches. However, this dependence on for instance the uploaded evidence has also brought about concerns over the restrictions and abuse of personal data, scope and rights of Ai applications being biased, among others. Some eighty percent of the proposed legal changes have worked adequately enough to bring out some of these concerns but the changes must be constant so that the emergence of technologies does not threaten the right to be regarded innocent until proven guilty (Sotomayor et al., 2024).

In contrast, in Pakistan, even though there is a growing inclination towards use of forensic and other scientific technologies in criminal investigations, their application remains limited due to serious problems within the justice delivery process. Public and physical infrastructure deficiencies, low levels of availability of human resource capacity building and societal attitudes have resulted into low penetration of digital evidence. In addition, the adoption of the legal systems and issues such as colonial rule and some Islamic laws have contributed to the slow rate of growth of the justice system. Consequently, the judicial system has not been objective in terms of utilization of reliable information dimensions which has in most cases deepened the gaps of inequality. In Pakistan, for instance, marginalized groups and women suffer additional barriers to justice interacting with the digital evidence related to the cases that demand further specific legal and institutional reforms (Ajmal & Rasool, 2022; Malik, 2022).

Both states demonstrate that although the digital evidences have the potential to ameliorate the accuracy and fairness of a criminal trial, they must be incorporated judiciously. In the U.S., where legal and technical infrastructures are more developed, the issue has to be ensuring the morally acceptable usage of technologies, notably in the sense of the predictive policing powered by AI where biases can lead to negative consequences. In Pakistan, building the required infrastructure and capacity to manage digital evidence should come first followed by solving the social issues which hinder access to justice for specific sections.

Lastly, the study attempts to articulate the reasons for the necessity of further legal changes, as well as permanent trainings on application of digital evidence within the framework of justice. Technology must not deepen deficiencies of the society but rather become an instrument of restoration of balance in the peoples' relations with the state system, including the criminal justice system. To this end, the report recommends the creation of appropriate guidelines for collecting and preserving digital evidence, laws addressing issues of privacy, which are non – existent or underdeveloped, and the introduction of training courses on the use of electronic information in legal proceedings. Only by idealistically and realistically confronting the scope of reforms in legal systems and administration does the full potential of technological advancement in justice delivery stand to be wholly exploited (Sotomayor et al., 2024; Ajmal & Rasool, 2022).

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