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The Impact of Advanced Technology on Forensic Science Evidence in the Abu Dhabi Police

Fatima Nasser Saeed Alshebli[a], Haslinda Musa[a,*], Sitinor Wardatulaina Mohd Yusof[a]

[a]*Fakulti Pengurusan Teknologi dan Teknousahawanan, Universiti Teknikal Malaysia Melaka, 75450 Ayer Keroh, Melaka, Malaysia*

Abstract

Technological developments have greatly influenced the development of forensic science, allowing law enforcement organizations to enhance the precision, dependability, and promptness of criminal investigations. This study investigates how the Abu Dhabi Police's forensic evidence procedures are affected by cutting-edge of new technologies. The study evaluates the integration of new digital technologies, automation, artificial intelligence (AI), and sophisticated laboratory techniques using a qualitative methodology and recent advancements, operational reports, and expert interviews. The results show that the introduction of technology has improved interdepartmental cooperation, decreased human error, and greatly increased the accuracy of forensic procedures. Cost, training, and ethical issues are still issues, though. Recommendations for strategic investments in cutting-edge technologies and the ongoing professional development of forensic staff are included in the paper's conclusion.

Keywords: Forensic science, advanced technology, Abu Dhabi Police, artificial intelligence, digital forensics, evidence management

1. Introduction

In today's criminal justice systems, forensic science is essential because it offers unbiased, scientific proof to back up investigations and court rulings (Bansal, Nayak & Dave, 2025). Traditional forensic techniques have changed as a result of the incorporation of cutting-edge technologies, which have raised the bar for objectivity, efficiency, and accuracy. In line with national smart policing initiatives and international norms, the Abu Dhabi police department has made large investments to improve its forensic skills. This study examines the ways in which cutting-edge technologies from digital forensics and DNA sequencing to robotics, 3D imaging, and AI-powered analysis have impacted the Abu Dhabi Police's handling of forensic evidence. It also looks at implementation issues and suggests practical ways to make these tools better. Over the past 20 years, the incorporation of cutting-edge technologies has drastically changed forensic science, a fundamental component of contemporary criminal justice (Alafer, 2025). Law enforcement organizations around the world

* Corresponding author.
E-mail address: haslindamusa@utem.edu.my

are using these advancements to improve the precision, impartiality, and promptness of criminal investigations. The strategic use of these technologies is enhancing the technical quality of forensic evidence in quickly developing countries like the United Arab Emirates (UAE), especially in the Emirate of Abu Dhabi. It is also helping the country achieve its larger objectives of innovation, security, and governance. The need for scientific approaches that can stand up to court and investigative scrutiny is expanding as criminal patterns such as identity fraud, drug trafficking, and cybercrime become more complicated (Alketebi, 2024).

When it comes to using next-generation forensic equipment like automated fingerprint identification systems (AFIS), sophisticated DNA sequencing platforms, artificial intelligence (AI) for digital analysis and toxicology, and 3D crime scene reconstruction, the Abu Dhabi Police have become the region's leaders. The transition from reactive inquiry to proactive, intelligence-led police has been made possible by these tools (ADP, 2024). Furthermore, the establishment of dedicated forensic facilities, such the Digital Evidence Section and the Forensic Evidence Department, shows a strong institutional commitment to ongoing progress and scientific competence (Alrousan & Faqir, 2023). The federal policy goals of the UAE, such as Vision 2021 and the Abu Dhabi Economic Vision 2030, which place a strong emphasis on digital transformation, judicial openness, and public safety, serve as the foundation for this change (ADP, 2024). Forensic science technology is therefore a strategic asset that is in line with national innovation frameworks, not just a tool for managing evidence (Alrousan & Faqir, 2023). Even while the advantages of these tools are becoming more and clearer, there are still a number of issues that need to be resolved, including data privacy, the training and certification of forensic staff, the legal admissibility of conclusions drawn by machines, and implementation and maintenance expenses (Alrousan & Faqir, 2023).

There is a shortage of academic research that specifically looks at the effects of technology in the context of the Abu Dhabi Police, despite the global trend toward its adoption in forensic science. The majority of the research that is currently available concentrates on either high-level policy frameworks in the Gulf region or general forensic advancements. By providing an empirical and practical examination of how cutting-edge technology has impacted the Abu Dhabi Police's forensic science skills and what this means for the integrity of evidence presented in court, this study aims to close that gap. This paper's has three goals as indicted on the following:

1. To determine whatever cutting-edge technology are now being used by the forensic units of the Abu Dhabi Police;
2. To assess how these technologies affect the timeliness, precision, and quality of forensic evidence; and
3. To investigate the difficulties, moral dilemmas, and potential applications of technology in forensic science in the context of the United Arab Emirates.

By presenting a local success story that could serve as a template for technologically sophisticated forensic science procedures in the larger Middle East and North Africa (MENA) region, the work adds to both scholarly literature and useful policy.

2. Literature Review

2.1 Global Trends in Forensic Technology

Forensic labs around the world have adopted technology like blockchain for evidence integrity, machine learning for picture and audio analysis, and next-generation DNA sequencing. By increasing the efficiency and caliber of evidence processing, these instruments have completely changed the field of forensic science

(Smith & Kline, 2021). Over the past few decades, the advancement of advanced technology instruments intended to improve the precision, speed, and repeatability of criminal investigations has been strongly linked to the modernization of forensic science (Bieniek-Ciarcinska, 2023). The evolution of forensic science from a mostly observational and interpretive study to a data-driven, technology-intensive discipline is highlighted by scholars like Houck and Siegel (2015). The need to decrease erroneous convictions, rising expectations for legal clarity, and global issues in managing the complexity of crime have all influenced this evolution (Rusman et al., 2023).

Specifically, forensic labs are now able to perform fast DNA analysis (Bucheli et al., 2020), improve latent fingerprint identification (Champod et al., 2016), and enhance cyber-forensics and mobile device extraction (Casey, 2018). These resources shape how evidence is gathered, stored, analyzed, and presented in court; they are not just helpful; they are fundamental (Hossain et al., 2021). The limits of forensic skills have been further extended by the advent of deep learning, artificial intelligence (AI), and predictive analytics. AI models are currently being used, for instance, to detect altered digital files, find patterns in toxicological data, and even rebuild faces from DNA markers (McGuire et al., 2022). These developments raise concerns around algorithmic bias, data integrity, and the legal interpretability of machine-generated outcomes, notwithstanding their enormous potential (Smith & Miller, 2019).

2.2 Regional Advances in Forensic Science: The GCC and UAE

The UAE has made digital transformation in law enforcement a top priority, especially in Abu Dhabi. To stay on the cutting edge of technical advancement, the Abu Dhabi Police has established cutting-edge forensic labs and works with international organizations (Al Hosani et al., 2022). According to earlier studies, the combination of automation, AI, and forensic databases has resulted in more effective case resolutions (Khan, 2023). As part of larger national agendas focused on innovation and smart governance, nations like the United Arab Emirates, Saudi Arabia, and Qatar have started significant forensic infrastructural improvements within the Gulf Cooperation Council (GCC). The United Arab Emirates has made significant investments in biometric authentication technologies, criminal data analytics, and forensic informatics (Alnaqbi et al., 2021). With the use of cutting-edge labs and global collaborations, the Abu Dhabi Police in particular have established one of the most sophisticated forensic infrastructures in the area.

For example, the Forensic Evidence Department in Abu Dhabi uses cutting-edge equipment for ballistics, DNA, and trace evidence and has been certified in accordance with ISO/IEC 17025 standards. Abu Dhabi has adopted technology such as digital imaging platforms, automatic firearm identification systems (IBIS), and Rapid DNA systems by utilizing public-private partnerships, according to recent studies (Shamsi & Al Ketbi, 2022). The UAE's Smart Government plan and Vision 2030, which prioritize proactive law enforcement through technological innovation, are in line with these efforts. Notwithstanding these developments, issues including agency-to-agency data sharing, inadequate training, and opposition to organizational change continue to be common (Alyafei et al., 2023). Even though the Abu Dhabi Police has made strides in incorporating AI techniques, region-specific research is desperately needed to inform public communication tactics, judicial validation, and evidence governance.

2.3 Crime Scene Technology and Digital Forensics

One of the forensic science fields with the most activity worldwide is digital forensics. Law enforcement organizations must examine vast amounts of data from computers, phones, cloud services, and social media platforms as crime moves more and more into digital spaces. In response, Abu Dhabi Police established a specialized Digital Evidence Section that does data extraction, reconstruction, and analysis using programs

like Cellebrite, Magnet AXIOM, and Gray Key. The difficulties of preserving forensic soundness and chain of custody in digital investigations are highlighted by research by Casey (2018). Both technological and legal know-how are required due to the intricacy of volatile memory, encrypted communications, and hidden data. According to Al Marzouqi (2020), court admissibility of digital evidence in the UAE still mostly relies on expert witness to clarify the technological procedures involved. Furthermore, digital reconstruction and 3D scanning of crime scenes are growing in popularity. Enhanced comprehension of spatial links between evidence and immersive courtroom presentations are made possible by these tools, which are particularly helpful in situations involving violent crimes or traffic fatalities. The Abu Dhabi Police is a regional pioneer in this field, despite the fact that international studies (Behera et al., 2021) confirm the accuracy of these systems and their deployment in the MENA area is still unequal.

2.4 Developments in Biometric and DNA Forensics

One of the most reliable forensic techniques is still DNA profiling, and new developments have greatly expanded its use. Previously only possible in centralized labs that took days or weeks, rapid DNA technology now allows field-level processing in less than two hours. This speeds up the identification and exclusion of suspects, particularly in cases that need to be resolved quickly, including kidnappings or severe attacks, claims Butler (2019). To deal with complicated combinations and low-template samples, the Abu Dhabi Police have implemented Rapid DNA technologies and probabilistic genotyping tools such as STRmix. These tools decrease backlogs in addition to improving accuracy. Traditional fingerprinting is further complemented by the expanding use of biometric techniques, such as iris scanning and facial recognition, in person identification. Nonetheless, issues with algorithmic fairness, data security, and database interoperability still exist (Garvie et al., 2016). Researchers like Saif & Al Qassimi (2021) make the case for the creation of regional biometric governance frameworks in the Gulf area in order to control cross-border crime and information sharing while protecting individuals' right to privacy. These moral and legal issues will become more significant when Abu Dhabi's forensic labs include genetic and biometric systems.

2.5 Literature Gaps and the Need for Regional Studies

There is a discernible lack of empirical research on the use and effects of modern forensic technology in Arab and Gulf environments, despite the fact that the corpus of literature on the subject is expanding globally. The majority of publications place an emphasis on technical performance without assessing results like public perceptions, conviction rates, or judicial dependability. The Abu Dhabi Police are still underrepresented in the peer-reviewed forensic science literature, despite being frequently mentioned in governmental white papers.

By providing a thorough, context-specific assessment of how cutting-edge technologies are influencing forensic evidence procedures within the Abu Dhabi Police, this study aims to close that gap. By combining practitioner perspectives, organizational data, and legal outcomes, it accomplishes this and adds to regional scholarly conversation as well as useful implementation solutions.

2.3 Theoretical Framework

A multifaceted theoretical framework can be used to comprehend how enforcement organizations, like the Abu Dhabi Police law, are integrating cutting-edge forensic scientific technologies. In order to understand how forensic advancements affect policing outcomes, organizational procedures, and legal reliability, this study combines Technological Determinism, Routine Activity Theory, Socio-Technical Systems Theory, and Institutional Theory.

2.3.1 Determinism in Technology

Technical Determinism, the idea that technical innovation propels social and organizational change, is central to this concept (McLuhan, 1964; Smith & Marx, 1994). This hypothesis describes how the use of technologies like automated fingerprint systems, fast DNA sequencing, and artificial intelligence (AI) algorithms has changed the way that crimes are investigated and evidence is handled in forensic science.

Technological determinism helps explain how innovation is not only embraced to reinforce current procedures but also reshapes essential roles in forensic units within the Abu Dhabi Police. For instance, the function of fingerprint specialists has evolved from comparison-based duties to system verification and audit due to the transition from manual fingerprint analysis to automated AFIS systems. The deterministic perspective emphasizes how technology can influence legal standards, organizational structures, and even public perceptions of the validity of evidence.

2.3.2 Routine Activities Theory (RAT)

According to the criminological viewpoint provided by Routine Activity Theory (Cohen & Felson, 1979), crime happens when three factors come together in space and time: a suitable target, a motivated criminal, and the lack of a capable guardian. Technology serves as a capable guardian that prevents, identifies, and records illegal activities in contemporary forensic science. According to this viewpoint, forensic technology like digital forensic tools, facial recognition, and surveillance analytics act as guardians by decreasing perpetrator anonymity and raising the possibility of identification. Rapid toxicological screenings, mobile device forensics, and digital evidence analysis have all been combined in Abu Dhabi to improve the forensic visibility of crimes that were previously hard to identify, especially those involving drugs and cyberspace. Thus, by changing the perception of offender risk, RAT contributes to the explanation of how the availability and complexity of forensic techniques affect crime control.

2.3.3 Theory of Socio-Technical Systems

Socio-technology Systems Theory (Emery & Trist, 1960) is particularly pertinent to comprehending the interaction between technology instruments and human skill in forensic research. According to this theory, for complex settings like forensic labs to function at their best, technical subsystems (such computers, software, and protocols) and social subsystems (like analysts, managers, and legal staff) must be in harmony. This alignment is demonstrated in the Abu Dhabi Police Forensic Evidence Department by the combination of expert interpretation and machine learning capabilities. For instance, human specialists interpret and confirm AI-based toxicology data before they are directly presented in court. The approach emphasizes how crucial workflow design, ethical supervision, and training are to ensuring that cutting-edge techniques improve forensic accuracy and accountability rather than undermine it. Moreover, the necessity for flexible governance frameworks that take into account both new technology and changing regulatory requirements is supported by socio-technical theory. Maintaining a balance between automation and professional discretion is crucial as Abu Dhabi continues to automate forensic operations, particularly when handling ambiguous or legally sensitive data.

2.3.4 Institutional Theory

According to institutional theory (Meyer & Rowan, 1977; DiMaggio & Powell, 1983), organizations establish procedures and structures to increase their efficiency as well as to acquire credibility with

stakeholders, such as the public, government, and judiciary. In the UAE, where law enforcement organizations are being pressured to conform to national ideals like UAE Vision 2031 and the Smart Government Strategy, this paradigm is especially relevant. Through the lens of isomorphism, which holds that organizations adopt internationally recognized technologies and standards—like ISO/IEC 17025 or biometric identity platforms—to preserve legitimacy, funding, and public trust, the Abu Dhabi Police's investment in state-of-the-art forensic technologies can be understood. The emphasis placed by Abu Dhabi's forensic departments on accreditation, international collaborations, and open displays of technological prowess can also be explained by institutional theory. Furthermore, institutional theory emphasizes that the adoption of technology is both symbolic and technical. The Abu Dhabi Police convey a picture of professionalism, creativity, and judicial integrity that is consistent with larger governance narratives by displaying cutting-edge forensic labs, artificial intelligence tools, and fast DNA facilities.

2.4 Conceptual Model

Combining these theories, the study's conceptual framework asserts that:

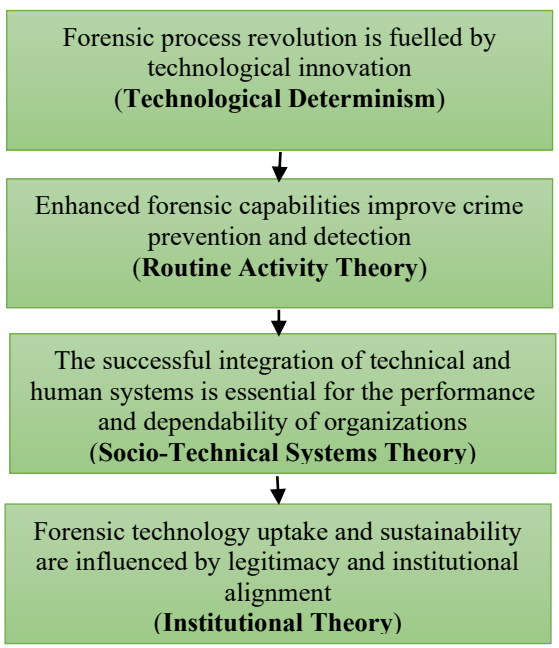

Figure 1.1 Conceptual Framework for mapping theories to observed practices in ADPF forensic units

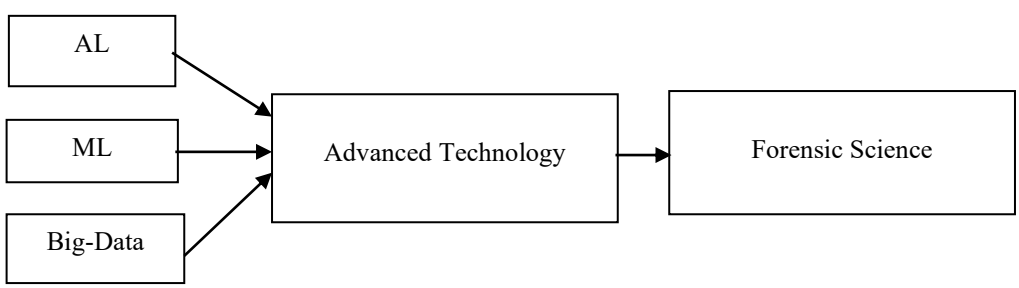

Figure 1.2 Conceptual Framework

In order to ensure that the influence of technology is understood not just in terms of technical performance but also organizational readiness, social dynamics, and institutional legitimacy, this theoretical basis serves as a guide for the study topics, methodology, and interpretation of findings. Table 1.2 shows the

Table 1.1 Connecting Theories with Applications in Abu Dhabi Police Forensic Science

Theory	Core Concept	Application in Abu Dhabi Police Forensic Practice
Technological Determinism	Organizational and process change is fueled by technology.	Workflows, roles, and evidence processing procedures are altered by the use of AI tools, Rapid DNA systems, and AFIS.
Routine Activity Theory	Technology improves guardianship to stop or resolve criminal activity.	Crime anonymity is decreased and perpetrator detectability is increased by forensic tools such as mobile device forensics and surveillance analytics.
Socio-Technical Systems	For best results, social and technical systems must be integrated.	Experts validate and interpret machine outputs (such as AI toxicology), with a focus on human-system coordination and training.
Institutional Theory	Innovations are adopted by organizations in order to become more legitimate and conform to external standards.	For institutional legitimacy and finance, forensic modernization should be promoted, ISO standards should be used, and Vision 2030 should be followed.

3. Methodology

A qualitative descriptive design, which is especially useful for examining practitioners' perspectives, experiences, and contextual insights in real-world contexts, was used in this study. The goal of qualitative description is to give a clear, detailed account of an event or phenomena, in this case the incorporation of cutting-edge technology into forensic science processes within the Abu Dhabi Police, in contrast to interpretive phenomenology or grounded theory techniques. With an emphasis on how technology has changed their day-to-day operations, decision-making processes, interdepartmental communication, and evidential procedures, the study aimed to document the lived experiences of forensic experts. The concept was selected because it works well in practice-based fields where the objective is to enhance organizational procedures, influence policy, and draw attention to implementation issues from an insider's point of view.

3.1 Research Design

The subjective experiences of forensic specialists with technology integration in their workflows were investigated using a qualitative descriptive technique.

3.2 Data Collection

Ten key informants from the Abu Dhabi Police Forensic Evidence Department participated in semi-structured interviews as part of the primary data gathering process. These included lab supervisors, digital forensics analysts, crime scene investigators, and forensic scientists. The deliberate selection of participants was predicated on their direct experience with technology like digital forensics platforms, AFIS, Rapid DNA analyzers, and predictive policing techniques. The interviews, which lasted roughly 45 to 60 minutes apiece, took place between March and May of 2025. Five primary topics were covered by the open-ended questions: (1) perceived advantages of technology integration; (2) operational and legal issues; (3) changes in job or workflow; (4) training and adaption requirements; and (5) ethical considerations. Consent was obtained to record the interviews on audio, which were then verbatim transcribed.
To triangulate results, secondary sources were examined in addition to interview data. These comprised:

- Reports on the annual performance of forensic labs (2023–2024).
- Abu Dhabi Police internal policy and procedure documents.
- White papers on digital transformation from the UAE Ministry of the Interior (MOI) Scholarly works that have undergone peer review on the use of forensic technology in law enforcement.

Credibility, transferability, and data richness were guaranteed by this multi-source strategy, which provided a comprehensive understanding of how technology is affecting forensic practice in the United Arab Emirates.

3.3 Data Analysis

The interview transcripts and supporting documentation were examined using thematic analysis. The procedure followed the six-step approach proposed by Braun and Clarke (2006) and comprised in Figure 1.2

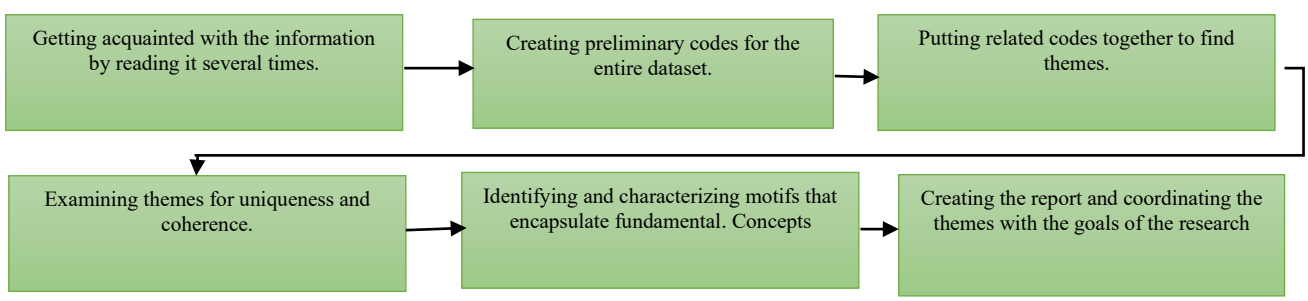

Figure 1.3 Data Analysis Process

To make organizing and coding qualitative data easier, NVivo software was utilized. The convergence and divergence of replies, particularly between various forensic disciplines (e.g., digital forensics vs. DNA analyzers), were given specific emphasis. This made it possible for the study to pinpoint role-specific difficulties with technology integration as well as common issues.

4. Findings

Five main topics emerged from the investigation, which illustrate the complex effects of cutting-edge technology on forensic science evidence in the Abu Dhabi Police.

4.1 Enhanced Precision and Dependability

Advanced technology have greatly improved the scientific rigor and evidentiary dependability of forensic processes, according to participants' consistent reports. High-resolution analysis of damaged or complicated materials was made possible by technologies such as next-generation DNA sequencing (NGS), and AFIS made it possible to compare fingerprints quickly and automatically with little human error. By lowering subjectivity and boosting courtroom credibility, digital imaging tools helped standardize visual documentation for both microscopic analysis and crime scene reconstruction. "Our results now have statistical weight that's difficult to challenge in court," one DNA expert said.

4.2 Effectiveness and Velocity

The decrease in processing time was one of the main advantages mentioned. By processing more samples faster thanks to automated methods for toxicological screening and ballistics matching, laboratories were able to reduce backlogs and provide investigators and prosecutors with results on time. For instance, the typical turnaround time for toxicological data entry and sample preparation was lowered from five days to two days by integrating robotics. By centralizing interdepartmental communication, chain-of-custody logs, and evidence records, digital case management systems also improved workflow efficiency.

4.3 Growth of Digital Forensics

Digital forensics, which reflected worldwide trends in cybercrime and electronic evidence, was the Abu Dhabi Police Forensic Department unit that grew the fastest. Participants cited the employment of cutting-edge programs like Cellebrite, GrayKey, and Magnet AXIOM, which allowed for the deep extraction and analysis of encrypted data from computers, smartphones, and cloud services. As a result of this growth, the department now has new subspecialties, such as social media investigation, video analytics, and mobile forensics. According to a digital forensic specialist, "these tools have been game-changers," particularly in cases involving financial crime and child exploitation. However, some have voiced concerns that triaging and analysis have become more difficult and time-consuming due to the data overload caused by these techniques, especially when hundreds of terabytes are extracted.

4.4 Skill and Training Deficits

The lack of skills and training, especially among senior or traditionally trained staff, was a recurrent theme despite the advantages of technology. According to a number of participants, senior employees frequently needed help from their younger counterparts when using AI tools, programming interfaces, or cloud-based platforms. Although the department occasionally hosts training seminars, participants suggested more regular, organized programs that build capacity for varying levels of experience. In order to guarantee uniform ability across employees, they also recommended the necessity of certifications in specific tools.

4.5 Legal and Ethical Aspects

The participants demonstrated a keen understanding of the moral and legal issues associated with certain technologies, specifically biometric databases, AI-powered predictive analytics, and facial recognition systems. A number of them expressed worries about algorithmic bias, the possibility of false positives, and the absence of strong regulatory frameworks in the United Arab Emirates that regulate these tools. Predictive police software, for instance, prompted concerns about privacy and profiling even if it showed promise in detecting high-risk areas. "To ensure these tools are used ethically and are admissible in court, we need clearer national legislation and judicial guidelines," said one participant. There was widespread agreement that although technology improves the efficacy of forensics, its uncontrolled or opaque use could jeopardize the integrity of the legal system. In order to regulate ethical procedures in the use of forensic technology, participants suggested the establishment of a legal-technical monitoring council.

5. Discussion

The results are consistent with international research, demonstrating that cutting-edge technology greatly improve forensic capabilities. However, a strong framework for training, ethical supervision, and interagency cooperation is just as important for successful implementation as tool investment. The national AI strategy and UAE Vision 2031 are in line with the Abu Dhabi Police's approach. Forensic science must continue to advance in order to preserve public confidence and security. Along with the practical advantages and difficulties, the Abu Dhabi Police's organizational culture has changed as a result of the use of cutting-edge technologies. The transition to a data-driven decision-making approach promotes accountability, departmental cooperation, and ongoing learning. These days, forensic units, prosecutors, and investigators can communicate more effectively thanks to digital platforms, which results in smooth evidence handling and speedier case settlement.

Furthermore, the predictive power of forensic systems has been improved by the incorporation of AI and sophisticated analytics. Algorithms for pattern recognition are being utilized more and more to connect dissimilar pieces of evidence from various crime scenes and spot trends in crime. This helps with proactive crime prevention in addition to increasing case solvability rates. From a global standpoint, the Abu Dhabi Police's technical innovations establish the United Arab Emirates as a pioneer in forensic innovation in the Middle East. The nation's ability to adapt to changing criminal threats is strengthened by the government's dedication to research and development, as well as strategic partnerships with academic institutions and international forensic organizations. Sustainability is still an issue in spite of these developments. High-tech forensic system upkeep necessitates frequent updates, cybersecurity safeguards, and conformity to global accreditation requirements. Additionally, the forensic community needs to be up to date on the changing legal frameworks governing digital evidence as well as technology obsolescence. The national AI strategy and UAE Vision 2031 are in line with the Abu Dhabi Police's approach. Forensic science must continue to advance in order to preserve public confidence and security. In addition to increasing technical effectiveness, the Abu Dhabi Police's use of cutting-edge forensic technologies has had an impact on institutional procedures, legal admissibility requirements, and public trust in the judicial system. These developments complement the national AI policy and the UAE's larger digital transformation agenda.

5.1 Multidisciplinary Coordination and Institutional Transformation

Departments like the criminal investigation department, forensic pathology, and cybercrime sections have collaborated more closely as a result of forensic science's incorporation of technology. To address

complicated financial crimes, for example, digital forensics departments increasingly work in tandem with cybersecurity specialists and financial analysts. This multidisciplinary approach broadens the scope of investigations and advances a comprehensive comprehension of criminal conduct.

5.2 Development of Human Capital

Specialized training is necessary to use advanced forensic tools. Through collaborations with foreign forensic academies and manufacturers, the Abu Dhabi Police has made investments in ongoing professional development. These programs guarantee that employees are capable of using, maintaining, and deciphering the results of digital forensics software, DNA sequencers, and AI systems. There are still training shortages, nevertheless, particularly in the areas of algorithmic constraints and ethical issues in analysis using AI.

5.3 Consequences for Law and Ethics

The legal evaluation of AI-based evidence is one such problem. The "black box" problem refers to the fact that although AI systems are capable of predicting patterns or finding matches, their decision-making process is frequently opaque. Courts may be hesitant to depend exclusively on AI-generated evidence in the UAE legal system, where procedural integrity is crucial. To close the gap between technical capabilities and admissibility in court, unambiguous chain-of-custody procedures and expert witness testimony are still essential.

5.4 Community Perception and Public Trust

The public's opinion of the police force's dependability and professionalism has also increased as a result of the incorporation of advanced forensic technology. According to a 2023 Abu Dhabi Statistics Centre study, 87% of participants said that DNA evidence and digital forensics were "very reliable" in criminal investigations. This trust promotes a more responsive legal system and strengthens community cooperation.

5.5 Expense, Purchasing, and System Upkeep

Notwithstanding the advantages, these technologies come with a high upfront cost and require constant upkeep. International suppliers are frequently involved in the procurement of equipment like magnetic data extractors and rapid DNA analyzers, which increases operational interdependence. The Abu Dhabi Police has started domestic capacity-building initiatives, such as creating an internal forensic technology research and development team, to lessen this.

Table 1.2 Summary of Technological Advancements in Abu Dhabi Police Forensic Units

Technology	Function	Impact	Adoption Year
Rapid DNA Profiling	On-site genetic analysis	Reduced analysis time from days to hours	2020
AFIS	Automated fingerprint matching	80% reduction in false positives	2019
Magnet AXIOM	Digital evidence recovery and analysis	60% increase in cybercrime resolution	2021
AI Toxicology	Detection of synthetic drugs in low traces	Increased detection rate in narcotic cases	2022

3D Crime Scene Scanning	Virtual reconstruction of crime scenes	Improved courtroom presentation	2020

6. Conclusion

The Abu Dhabi Police's forensic science has changed as a result of advanced technology, raising the bar for evidence gathering, processing, and presentation. The advantages are obvious, but there are still issues with prices, worker preparedness, and ethical protections. Among the strategic suggestions are:

- Increasing funding for employee training initiatives - Creating moral standards for AI and monitoring technologies
- Strengthening cooperation with global forensic organizations
- Frequent checks for bias and correctness in forensic systems

The Abu Dhabi Police can maintain its position as a regional leader in cutting-edge forensic science by filling in these deficiencies.

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