



C30 Pathways to the Identification of Multinational Victims of Mass Disasters: The Role of Blockchain Technology

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Learning Overview: After attending this presentation, attendees will have learned, using real-world cases, how blockchain technology adoption can achieve an automated archiving system to fully manage the identification of medical and dental data for comparison and data mining that should promote novel solutions for forensic human identification and Disaster Victim Identification (DVI).

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating how blockchain technology adoption should revolutionize the human identification and disaster management processes worldwide, improving the management of missing persons, Antemortem (AM) data repositories of living people, Postmortem (PM) data repositories of recovered unidentified human remains, interactions with electronic medical and dental records, and helping to facilitate the comparison of compatible biological profiles for definitive identification. The possible applications presented in this study promise enormous benefits to authorities, victims, their families, and society in general. This presentation should create a trusted ecosystem to help forensic science practitioners advance beyond traditional methods and stimulate innovative collaborations with computer scientists in order to improve procedures, especially in the area of forensic dental identification.

In mass disasters with multinational victims, it is critical to identify the deceased for judicial, ethical, religious, and human rights reasons, as well as to allow the next of kin to complete the grieving process. The DVI process is a complex procedure in which PM identifying data, essentially fingerprints, DNA, and dental, is collected, then compared with equivalent AM data related to the missing person's list. Although there are solutions used in the field of human identification, they all fall short of equipping practitioners with the tools needed for achieving human identification in a timely manner. Initially, it is significantly challenging to manage missing person's lists containing years, and sometimes decades, of family AM data resources' updates. Furthermore, there is currently no record of any holistic and decentralized technical solutions for managing both AM and PM data for human identification to support collaborative multinational and interjurisdictional processes. Blockchain technology provides the tools to facilitate building trustworthy, secure, and holistic ecosystems, and it can disseminate siloed AM and PM data across systems, protecting data breaches, redundancies, inconsistencies, and errors. As such, blockchain technology can revolutionize the human identification process worldwide in terms of managing missing person's lists, AM data repositories for living people, PM data repositories of recovered unidentified victims, and contribute to the comparison of compatible biological profiles for definitive identification.

This study presents real-world use cases that examine how this technology facilitates multi-jurisdictional data information-sharing in conjunction with the forthcoming circulation of patients' electronic medical and dental records. This study encourages openness and interjurisdictional victim information-sharing to paint a full picture that would allow each team to perform their tasks. However, this raises information security and privacy concerns that could hinder its adoption by some DVI teams that have to comply with tighter jurisdiction-specific data protection laws and regulations that are not applicable elsewhere, such as the General Data Protection Regulation (GDPR), considered the toughest privacy and security law applied today.

Blockchain Technology, Disaster Victim Identification, Forensic Odontology