Evaluation of Digital Evidence Processing Efficiencies in Publicly Funded Crime Laboratories

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The New DNA: Recommendations for Agencies to Consider Implementing to Improve Digital Evidence Processing and Analysis

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Highlights

- On average, crime laboratories not accredited specifically for digital evidence (DE) processing received 2.5 times the amount of testing requests that the DE-accredited crime laboratories did, which indicates a discrepancy in the field for DE accreditation.
- Nearly half of responding laboratories reported not having a policy for triaging DE, but received, on average, 653 total requests for DE processing in 2020.
- A total of 19 laboratories reported frequent communication ("often" or "always") with investigating law enforcement officers without a designated liaison for communication, while 9 laboratories reported a designated liaison.
- Approximately 91% of law enforcement respondents stated that their agencies were responsible for determining what DE is collected on scene, but only 18% claimed to have a "submit all" policy for DE, which suggests that triaging is completed in the field, but also following collection for most agencies.
- All responding agencies indicated that officers have received training regarding the seizure of DE, and 93% have received training regarding the processing or analyzing of DE.
- Approximately 87% of agencies reported that their law enforcement agency has the ability and capacity to analyze DE internally.
- Approximately 64% of respondents indicated that their agency has a computerized evidence tracking system capable of tracking DE.

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Introduction

With the widespread use of smartphones and other mobile devices among the general population, it is increasingly necessary for law enforcement and crime laboratory personnel to develop methods to more efficiently process and analyze DE. In response to the growth of DE in criminal investigations, the National Institute of Justice (NIJ) published the *Digital Evidence Policies and Procedures Manual* in May 2020 to guide law enforcement agencies in creating protocols for handling and processing DE in their agencies. Despite the manual and other federal programs aimed at improving the processing and collection of DE, backlogs, understaffing, and the large volume of DE make it difficult for many agencies to effectively collect DE (Novak, 2021). This brief contains important DE findings and implications for both law enforcement and crime laboratories that resulted from an exploratory study conducted by RTI International. It also summarizes key considerations for law enforcement for storing DE and submitting it for analysis and for crime laboratories when processing DE.

Methods

Surveys were administered between February 2022 and March 2023 and generally inquired about DE data and information from the 2020 calendar year. A purposive subset of DE crime laboratories and their law enforcement partner agencies were then selected for in-depth qualitative interviews.

Digital Evidence Laboratory Survey

The 2014 data from the Bureau of Justice Statistics' Census for Publicly Funded Forensic Crime Laboratories (2014) was used to inform the DE laboratory frame for this study (Brooks, 2014) since it was the most recent publicly available data but also because that administration included a special DE supplement (Brooks, 2014). RTI sent online surveys to 80 local and state-based laboratories with computer/cybercrime/DE sections or departments. Critical components of the survey included demographics and laboratory budget, DE characteristics, processing and submission policies, management and retention, and cross-agency communication with respective submitting agencies. The DE laboratory survey took about 15–20 minutes to complete, and the survey was in the field from January 2022 to June 2022. A total of 32 laboratories completed the DE survey, representing a 40% response rate.

Law Enforcement Survey

The law enforcement survey consisted of questions regarding identical topics to those of the crime laboratory survey but tailored to law enforcement agencies, including demographics

and budget, agency characteristics (e.g., number of DE items and cases, types of DE submitted), agency processing and submission policies, management and retention, and cross-agency communication with respective submitting agencies. The digital laboratories that participated in the laboratory survey were asked the following question: "How many law enforcement agencies does your laboratory receive DE from? Please list the names of those law enforcement agencies below." A total of 71 law enforcement agencies were identified based on the crime laboratories responses, and all agencies were sent the law enforcement survey. The law enforcement surveys were administered between October 2022 and March 2023. Nearly 23% (n=16) of law enforcement agencies completed the survey in full, while an additional 11% (n=8) provided data, equating to a total response rate of approximately 34%.

Qualitative Interviews

The goal of the interviews was to pair law enforcement agencies with a crime laboratory to which they submit DE in order to gain a deeper understanding of the relationship between the two entities. The 10 individuals who participated in the qualitative interviews represented law enforcement investigators (3) and crime laboratory personnel (7) with varying degrees of experience with DE. All interviewees except for one participated in the survey. Interviews were conducted via Zoom between May and August 2023. Informed consent was obtained before interviews were conducted, and all interviews were recorded following the consent of all participants. The recordings were transcribed into electronic files that the site visit team members reviewed before they were finalized.

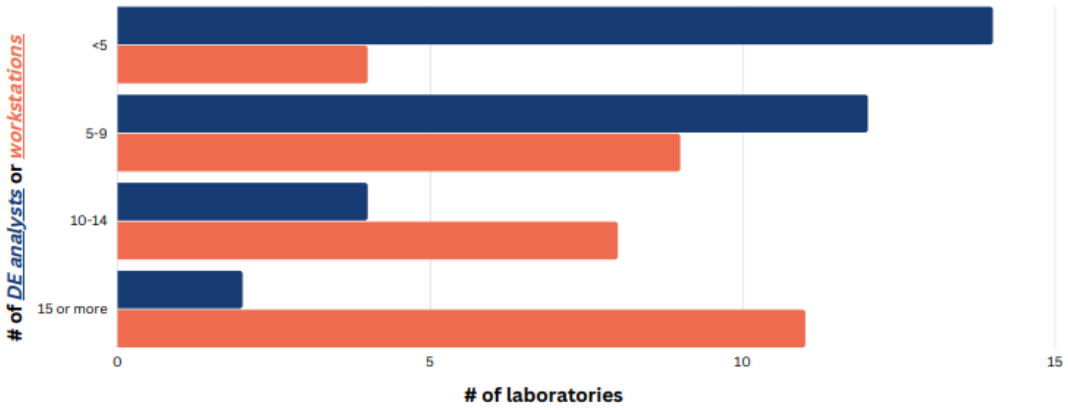
The interviews followed a semi-structured qualitative study instrument, which allowed interviewers to ensure they covered all the main topics while also allowing for new ideas and topics to emerge during conversation. The qualitative study instruments were developed by the study team to capture information related to agency resources, interagency communication, and evidence management and retention policies. Each interview was recorded, transcribed, and later coded in NVivo 12.0.

Findings and Implications Survey

Nearly half of DE laboratories (44%; 14 laboratories) did not have a policy for triaging DE, and about two-thirds did not have a policy on DE retention. However, nearly 91% of responding agencies indicated they have a policy in place for the processing of DE. Specific focus was placed on policy presence in the survey to understand what practices were in place as the demand for DE processing grows at an exponential rate. On average, crime laboratories not accredited specifically for DE processing received 2.5 times the amount of testing requests that the DE-accredited crime laboratories did, indicating a discrepancy in the field for DE accreditation. The distribution of DE analysts vs. forensic workstations in the laboratory setting was notable in that many laboratories have fewer than 5 DE analysts but more than 15 forensic workstations (Figure 1). This could be attributed to a lack of staff or

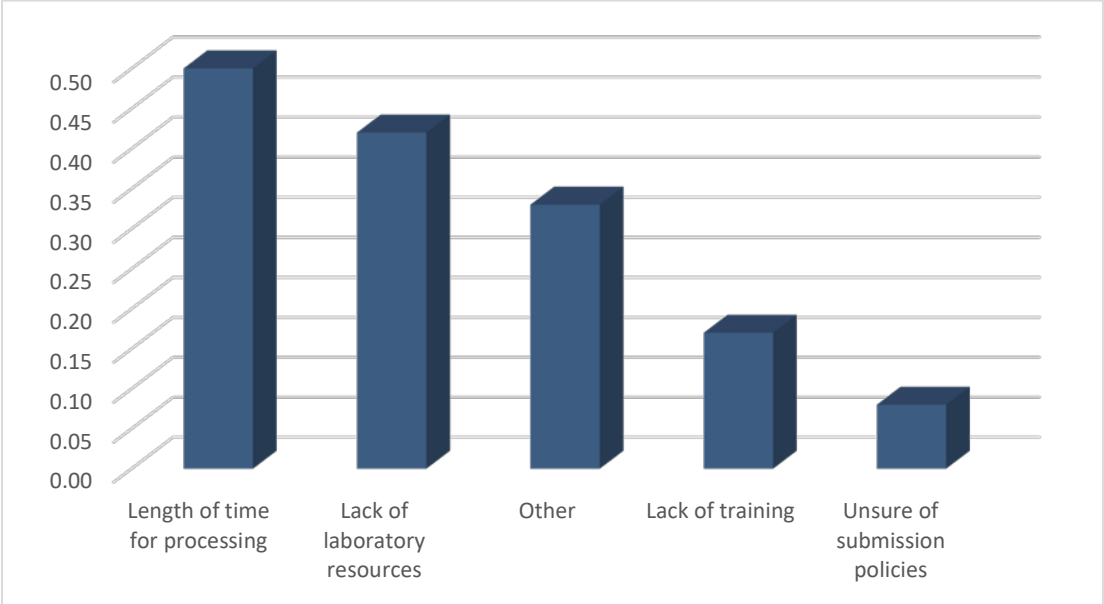
simply funding allocated specifically for DE processing. The two evidence types processed by laboratories that made up the overwhelmingly majority were mobile devices and computers, with these devices representing approximately 77% of total DE processing requests on average. With regard to cross-agency communication, 19 laboratories reported frequent communication ("often" or "always") with investigating law enforcement officers but not having a designated liaison for communication, while 9 laboratories reported having a designated liaison.

Figure 1. Distribution of DE Analysts vs. Forensic Workstations (n=32)



This bar graph highlights the distribution of analysts specifically assigned to process DE related to the number of forensic workstations available in various laboratories.

Figure 2. Barriers to Submitting Digital Evidence to the Crime Laboratory for LEA



This bar graph highlights the breakdown of barriers from the law enforcement perspective to submitting digital evidence for processing to the crime laboratory.

Approximately 91% of law enforcement respondents stated that their agency was responsible for determining what DE is collected on scene, but only 18% claimed to have a "submit all" policy for DE, suggesting that triaging is completed in the field, but also following collection for most agencies. All responding agencies indicated that officers have received training regarding the seizure of DE, and 93% have received training regarding the processing or analyzing of DE. Approximately 87% of law enforcement agencies reported having the ability and capacity to analyze DE internally. When asked about potential barriers to submitting DE to the crime laboratory, half of respondents indicated that the length of time it takes a laboratory to process DE was their biggest barrier (see Figure 2), followed by the lack of laboratory resources. Approximately 64% of respondents indicated that their agency has a computerized evidence tracking system capable of tracking DE.

Qualitative Interviews

> "I mean, the biggest challenge I face, really, for digital, is that ongoing subscription fees, that's the biggest challenge we've got right now is going in and doing the tap dance every year before the commissioner and asking them for that 90,000 bucks basically for two subscriptions and that just every year it's a hassle.
>
> *Crime laboratory participant*

Accreditation, Budget, and Training. All crime laboratory interviewees came from laboratories accredited for analyzing DE and recognized its importance. One interviewee had a specific budget for processing DE, which was created in 2020, while the other nine interviewees noted their agency had one budget for all disciplines or investigations. All the interviewees noted that a key budgetary difference between DE and other forensic disciplines is that unlike other disciplines that require expensive equipment that is a onetime purchase, most of the software used in DE analysis is subscription based and represents a continuous expensive cost for the agency. All interviewees stated that either they or DE analysts in their agency have received training on DE analysis or investigations; however, several interviewees stated that the level of training among analysts can vary based on their background and funds available.

Importance of DE for Investigations. Both law enforcement and crime laboratory interviewees recognized how critical DE is to modern-day investigations and prosecutions. Mobile devices were the most widely analyzed type of DE among interviewees and the most effective type of DE used at trial. According to one of the crime laboratory interviewees, "I heard one of the sergeants talking to one of our supervisors, and he told her that cell phones are more important to them for their murder cases than DNA now" (Crime laboratory participant).

DE Triaging, Policies, and Procedures. Most crime laboratory interviewees stated that they receive requests for analyzing DE every day, while one stated they receive requests for analyzing DE at least three times a week. There was a lot of variety among interviewees

regarding the average turnaround time for testing DE, but all interviewees agreed that turnaround time was dependent on the type of DE submitted. Another major factor in turnaround time, specifically for mobile devices, was the strength of their passcodes and the ability of available software to crack the password and open the phone. Most respondents—both crime laboratory and law enforcement representatives—had a policy or an "unwritten rule" for triaging evidence (Law enforcement participant). Most interviewees stated their agency would triage DE based on the severity of the crime with evidence from a violent crime or crime against a person taking priority over a non-violent crime or crime against property. All crime laboratory respondents provide all the data available from a device or everything from a certain timeframe that was included in a search warrant back to the requesting agency.

Only one interviewee's agency did not have a retention policy in place, because their policy is to send everything, including the device, back to the requesting agency. The other interviewees' agencies had retention policies that ranged from 10 years to indefinitely. Methods of retention ranged from paper copies to physical USB back-ups to cloud storage. Most interviewees had a backlog of DE, which they attributed mainly to staffing shortages.

> "Email is probably your best friend…because in a laboratory we typically work 8 to 5. That's not the case with so many agencies that are typically working rotating shifts…A lot of times telephone calls can just be difficult because schedules just don't sync up in order to make the conversation happen.
>
> *Crime laboratory participant*

Open communication between law enforcement and the crime laboratory to which they are submitting DE is a crucial component of successful investigation. Most interviewees stated that they communicated with one another through email, with two different crime laboratory representatives mentioning that they use an email that is generated through their laboratory information system (LIMS). One law enforcement agency had a staff member who was specifically focused on preparing DE for submission to the crime laboratory and communicates with the crime laboratory regarding the evidence. This agency found this position to be helpful for creating standardization across submissions and promoting a positive working relationship between the law enforcement agency and the crime laboratory.

Recommendations for Agencies to Consider

On the basis of the data collected, we identified the concepts listed in the following tables as potential areas for consideration to optimize processes and efficiencies for the collection, triaging, processing, and storage of DE for law enforcement and crime laboratories.

Table 1. Considerations for Law Enforcement

Recommendations for Law Enforcement Agency Submitting Digital Evidence
Agency Demographics and Resources
▪ Prioritize training regarding DE and updates to the field for all investigative staff. ▪ Review evidence testing budget to secure adequate funding for testing DE. ▪ Consider applying for federal grants like the Paul Coverdell Forensic Science Improvement Grants Program to cover expenses associated with DE specifically. ▪ Consider utilizing free online trainings, including those from the National White Collar Crime Center to ensure all analysts have the same level of understanding and training.
Digital Evidence Policies
▪ Ensure that policies for triaging DE at the crime scene and prior to submission to a crime laboratory are clear for each crime type. ▪ Be precise in your investigative needs when submitting DE and supporting search warrants to crime laboratory.
Digital Evidence Management and Retention
▪ Streamline electronic management of DE as much as possible with your crime laboratory, either through integration of LIMS systems or through spreadsheet sharing. ▪ Review DE retention policies and ensure they are adequate for your agency's needs. ▪ Meet with you local prosecutor's office to ensure retention policies are in compliance with local and state statutes.
Cross-Agency Communication and Coordination
▪ Work with your crime laboratory to set up a time to tour their facility to understand their policies and procedures and develop a shared understanding of timelines and methods of receiving analyzed data. ▪ Explore the idea of setting up a monthly or quarterly meeting with the DE section of your partner crime laboratory and use that time to discuss the status of submitted cases and discuss possible ways to triage DE and ensure mutual understanding of who DE is being triaged by from both agencies. ▪ Consider creating a "crime laboratory liaison" position within your investigative unit to ensure all DE is submitted in a standard way and to promote a positive relationship and collaboration between the two entities.

Table 2. Considerations for Crime Laboratories

Recommendations for Crime Laboratory Processing Digital Evidence
Agency Demographics and Resources
▪ When possible, having a budget allocated for DE processing will allow for more transparent tracking of resources that are dedicated to DE analysts, processing software, and more. ▪ Prioritize funding and resources for training and certification for analysts. ▪ Becoming accredited specifically for DE allows a laboratory to keep certifications up to date on a routine basis and testify in court. ▪ Staffing a laboratory sector with analysts assigned to DE processing at a proportional rate to the demands of DE processing promotes the completion of testing in an efficient manner and also reduces burnout and therefore turnover. ▪ Purchasing of passcode "unlocking" software (e.g., GrayKey, Cellebrite) should be prioritized when possible, reducing the cost associated with renewing a subscription on an annual basis. Consider exploring partnering with other crime laboratories in your region or state to share the subscription cost of some DE software that allow for multiple users.
Digital Evidence Policies
▪ As with any other evidence type, a policy outlining the DE processing procedures and restrictions for maintaining the integrity of the evidence promotes successful completion. ▪ The development of a triage policy that notes at what step in the process triage (by type, priority, etc.) should take place will allow for more transparent, consistent, efficient, and timely processing. ▪ Information-sharing policies will improve agency transparency and reduce communication barriers that may exist across agencies.
Digital Evidence Management and Retention
▪ Recording and tracking all DE submitted to laboratories expands the ability to share information with relevant personnel, including external partnering agencies. ▪ When not specifically mandated by legislation, consider implementing an evidence retention policy specific to DE. Even a policy outlining a storage procedure for maintaining case data may be helpful for future reference.
Cross-Agency Communication and Coordination
▪ The presence of a dedicated point of contact for communicating between laboratories and their respective law enforcement partners would likely save time and resources. In addition, this would invite a more standardized evidence submission procedure and routine communications with case/processing updates. ▪ Laboratories and their respective law enforcement agencies should consider implementing an electronic system that promotes information sharing from an automated standpoint.

References

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