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Increasing Efficiency in Crime Laboratories

THE ISSUE

Television has given forensic science great public visibility, but provides viewers with the mistaken notion that crime laboratories provide results quickly. In truth, most crime laboratories have large case backlogs. In a census of publicly funded laboratories, the Bureau of Justice Statistics (BJS) reported that crime laboratories had more than 500,000 backlogged requests for forensic services.[1] And a recent National Institute of Justice (NIJ) report to Congress suggested that "crime laboratory backlogs cause significant delays in evidence being analyzed, resulting in investigation and court proceeding delays."[2]

Most crime laboratories report insufficient staffing as a reason for laboratory backlogs. Because these laboratories have limited budgets to hire additional staff,[3] they employ a variety of strategies to manage backlogged cases. For example, some laboratories establish case acceptance policies to limit the number of cases they receive. Other labs have returned evidence to police agencies because they could not complete the analysis in a timely manner.

CHANGING STRATEGIES

Some laboratories have found a way to address backlog problems without a large increase in personnel or a policy that limits case submissions. They hire consultants to assist them in implementing managerial advances such as:

- **Process mapping.** A system that uses flowcharts to help visualize the laboratory's analytical process. Laboratories use this information to derive solutions to maximize efficiency.

- **Efficiency forum.** A review of laboratory analytical capabilities based on a project management system, ADDIE, whose stages involve analysis, design, development, implementation, and evaluation.
- **Business project management (BPM).** A computer-enabled management tool that supports change and innovation, often used by government agencies to streamline administrative and analytical processes.

These techniques help managers review their laboratory systems and processes and determine how best to allocate staff and resources. The techniques are often used to redesign and streamline laboratory procedures and plan for new technologies.

One Laboratory's Challenge

The Palm Beach County Sheriff's Office Crime Laboratory encountered severe backlog challenges, causing a crisis that made personnel rethink management strategies. Between 2003 and 2005, the Palm Beach Crime Laboratory experienced an almost three-fold increase in its DNA caseload—from 742 cases submitted in 2003 to more than 2,200 cases in 2005. At the same time, the laboratory was conducting tests to implement new DNA technologies and renovating laboratory space. Faced with the combined challenge of an increased workload and process improvements, the laboratory used grant funding from NIJ to hire a process mapping consulting firm.

The Results

"The first few days were a tedious review of what we already knew. Then the light bulb went on," said Cecelia Crouse, supervisor of the DNA section of the Palm Beach Crime Laboratory. After hiring the process mapping consulting firm, the team started seeing areas where time was wasted and began eliminating them. For example, the team calculated that scientists spent approximately 16 days a month on clerical work. When the laboratory hired a new evidence coordinator to do the clerical work, they were able to analyze an extra 100 cases per year, nearly the equivalent casework output of a full-time DNA analyst.

Further Process Mapping Successes

Florida Department of Law Enforcement. In 2000, the Florida Department of Law Enforcement (FDLE) DNA database had a backlog of 12,000 samples older than 30 days and anticipated receiving 35,000 new samples over the next year. One Florida center, the Tallahassee Regional Operations Center, faced the added challenge of implementing technology changes.

To address the situation, FDLE used grant funding to hire a consultant to help them analyze their systems and implement process mapping. FDLE used the information developed from process mapping exercises, applying necessary changes to their database laboratory and eliminating their backlog by 2002, even though their sample submissions had increased by 31 percent that year (to 46,000 new samples). By 2006, the sample analysis time had decreased from 30 days to 8 days despite an approximately 85 percent increase (since 2000) in the number of samples received.

Dave Coffman, chief of forensic services in Tallahassee and the former supervisor of the DNA database, estimates that implementing the changes identified through process mapping has helped FDLE increase the capacity of the DNA database laboratory to 110,000 samples per year without hiring extra analytical staff. According to Coffman, information produced during process mapping helped them justify being included in a new statewide initiative on automatic labeling (i.e., barcoding) that will save the laboratory an additional $300,000 per year.

Georgia Bureau of Investigation. When designing specifications for a new computerized reporting system for its crime laboratory, the Georgia Bureau of Investigation decided to try a new efficiency technique similar to process mapping. The Bureau's old system

required laboratory personnel to mail approximately 100,000 reports to police agencies and other users each year. The new paperless tracking and reporting system reduces the time required to input data and send results to investigators. George Herrin, the Bureau's assistant deputy director, estimates the electronic distribution of reports saves the laboratory approximately three staff positions, or approximately $100,000 per year.

Other Promising Tools

Illinois State Police. In 2006, the Illinois State Police reviewed their forensic biology and DNA section using another process improvement initiative called the efficiency forum. This process, based on another management tool used to evaluate and improve laboratory procedures, was conducted with the assistance of the National Forensic Science Technology Center.[4] Although laboratories cannot calculate results this early in the process, Michael Sheppo, former commander of the Illinois laboratory system, thinks that efficiency forum recommendations will allow the laboratories to process evidence in their forensic biology or DNA section more efficiently.

FBI Laboratory. The Federal Bureau of Investigation (FBI) Laboratory is using business project management (BPM) to review its laboratory processes and identify areas for improvement. BPM is a computer-based tool that creates and tests workflow models. The FBI is combining the efforts of consultants and in-house staff in this efficiency effort. When the process is complete, the laboratory expects to eliminate unnecessary steps in its processes, which will allow them to analyze more casework without an increase in staff.

Bottom Line

"[Process mapping] was one of the best investments of time and money we ever made," said Palm Beach's Crouse.

Others agree that modern efficiency techniques like process mapping have advanced laboratory procedures and improved their labs. FDLE's Coffman says that this management review of their process helped FDLE create their "road map" for the future.

Laboratories building capacity are encouraged to seek ways to improve efficiency through the use of strategic management tools such as process mapping, the efficiency forum, and similar initiatives.

Notes

1. Bureau of Justice Statistics, *Census of Publicly Funded Forensic Crime Laboratories, 2002,* Washington, DC: U.S. Department of Justice, Bureau of Justice Statistics, February 2005, NCJ 207205.

2. National Institute of Justice, *Status and Needs of Forensic Science Service Providers: A Report to Congress,* Washington, DC: U.S. Department of Justice, National Institute of Justice, March 2006, NCJ 213420.

3. National Institute of Justice, *Forensic Sciences: Review of Status and Needs,* Washington, DC: U.S. Department of Justice, National Institute of Justice, February 1999, NCJ 173412.

4. Forensic Services Review Project, National Forensic Science Technology Center, *www.nfstc.org/programs/index.htm.*

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For More Information

Numerous commercial vendors provide process mapping consulting services. Many of these vendors can be found through a traditional Internet search engine.

For more information on the efficiency forum process facilitated by the National Forensic Science Technology Center, see the Forensic Services Review Project at *www.nfstc.org/programs/index.htm.*