CRJS475 Unit 1 Discussion Board - Assurance vs. Control: QA and QC in Digital Investigations

Digital forensics is a subset of the forensic discipline known as *digital and multimedia evidence*, which involves the examination and analysis of digital evidence in legal matters. It includes acquiring and preserving digital evidence in any form, which includes analyzing computers, tablets, cellphones, and other digital devices (Council of the Inspectors General on Integrity and Efficiency, 2012).

Terms

- **QA:** Quality assurance
- **QC:** Quality control
- **SOP:** Standard operating procedure
- **QA & QC purposes:** Include the following (Gossman & Denlinger, 2018):
    - Evidence collection
    - Handling
    - Transportation
    - Forensic or digital analysis

Specific steps need to be taken to ensure that the quality of the evidence is not lost, degraded, or destroyed through improper collection procedures. For it to be of evidentiary value in court, evidence must be reliable and valid. Ideally, this is best achieved through a quality assurance (QA) or quality control (QC) program. The terms *QA* and *QC* are related, but they have subtle differences (Gossman & Denlinger, 2018). It is important to agree on the differences between QA and QC. Many people use the terms interchangeably, but QA is actually a preventative measure, whereas QC is an identifier of problems or issues (Ferrarini, 2014).

QA & QC Explained

Quality assurance defines goals, whereas *QC* identifies mechanisms that are used to reliably achieve those goals. These terms are further described as follows (Gossman & Denlinger, 2018):

- **Quality assurance:** Written standard operating procedures (SOPs)
- **Quality control:** Actual performance and measurement to ensure validity and reliability

The following is a comparison of QA and QC:

Quality Assurance **Written Guidelines**	**Quality Control** **Actual Performance**
Policy (SOPs)	Performance (observation)
Failure prevention	Failure detection
Written procedures (SOPs) are implemented in a quality assurance system so that quality requirements are fulfilled.	Actual observation of performance, techniques, or activities is used to fulfill the forensic mission.
This is a failure prevention system that predicts almost everything that could go wrong with task performance, maintaining quality standards, and legal issues, and then it takes steps to prevent flawed tasks from reaching advanced stages (Ferrarini, 2014).	This is a failure detection system that uses testing techniques to identify errors or flaws in tasks to ensure that performance meets requirements that are written in QA SOPs (Ferrarini, 2014).

Quality Assurance: Written Guidelines

Quality assurance creates written procedures or SOPs for how to collect, handle, preserve, transport, and analyze evidence to ensure its reliability and accuracy during investigations—and, ultimately, for its legal admissibility in court. A good QA program will address anything that can be done during a forensic investigation for the purpose of reducing mistakes and errors that may jeopardize the correct outcome of an investigation (Gossman & Denlinger, 2018). Quality assurance is "a part of quality management focused on providing confidence that quality requirements will be fulfilled" (BSI, 2015). It focuses on processes and their continuous improvement, with a goal of reducing variances in processes, to predict the quality of a task (Ferrarini, 2014). It should provide clearly written SOPs to ensure that analytical procedures are being followed in the field and in a lab. Quality assurance SOPs should provide specific instructions on how to perform specific tasks. These SOPs can also require that analysists must be trained in specific procedures, such as how to do the following (Gossman & Denlinger, 2018):

- Use correct testing procedures
- Maintain equipment
- Properly calibrate equipment according to the manufacturer's guidelines

A good investigator will identify the appropriate SOP that needs to be followed for each task or scenario.

Quality Control: Actual Performance or Testing

Quality control identifies specific control mechanisms that can be used to achieve the goal of QA. It monitors and confirms the accuracy and precision of forensic results. For example, QC will demonstrate that proper techniques were followed by an investigator while they are actually collecting or sampling evidence. Demonstrable examples of QC can include the following (Gossman & Denlinger, 2018):

- Collecting samples
- Performing a duplicate analysis on a percentage of samples

- Analyzing a certain number of materials with every sample set to determine the accuracy of an analysis
- Duplicate or triplicate testing of samples

For cyber intrusion investigations, digital metrics used in QC might include the following (Ferrarini, 2014):

- Number of defects actually found vs. those actually fixed
- Defects by severity level

Courtroom Application of QA and QC

The final outcome of a court case often relies on the following:

- Credibility of a forensic analysis
- Credibility of the forensic interpretation of that evidence

Inadequate QA and QC procedures and insufficient training can be legal reasons for attacking a forensic expert's courtroom testimony. Attacking an investigator's credibility is used when shoddy QA and QC methods and procedures are identified by an attorney. A good investigator will ensure that each forensic case has a solid legal QA and QC basis (Gossman & Denlinger, 2018). Proper adherence to SOPs brings credibility to forensic results and to forensic testimony.

References

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