E23 A Methodology for the Forensic Examination of Cellular Telephones

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The goal of this presentation is to describe a newly developed advanced cellular telephone examination methodology. This presentation will also demonstrate the significant reduction in cellular telephone exam- ination time while also eliminating data loss and reporting errors.

The affordability of cellular telephones has ensured their wide use in today's society, and the timely examination of this type of evidence can have a significant impact on an investigation. Cellular telephone examination requests were first accepted at the Centre of Forensic Sciences in 2000 and have steadily increased in number to represent over 60% of digital evidence casework. The modern cellular telephone can contain a significant amount of information, ranging from call detail logs and phone- books to multimedia data such as audio, images and video, all of which may be relevant to an investigation.

There are three basic methods of acquiring cellular telephone data: memory imaging, downloading through data cable, and physical manipu- lation of the device while photographing sequentially displayed screen images. All three approaches have their strengths and drawbacks. Imaging can yield all data stored in memory, but it may sometimes be necessary to physically remove the internal memory from the telephone's circuit board in order to accomplish this task. This can be challenging, requiring a skill set and equipment that may be unfamiliar to many digital evidence exam- iners. The second method, downloading data through a cable using appro- priate software, appears at first sight be a workable option but can carry with it two significant problems: software manufacturer delay time in keeping up to date with the latest devices, and verification of the software to ensure that the process of downloading information is reliable.

In the third method, the cellular telephone is manually manipulated while observing information presented on the display screen. When cel- lular telephone examinations were first undertaken at this laboratory, call log and phone book data were captured by scrolling through the telephone display screens and manually transcribing the data. This system was time consuming, subject to transcription error both in collecting the data and in generating the report, and carried the additional risk of the possibility of altering data by accidentally initiating a call or deleting records. An interim solution incorporated the use of a digital still camera to capture display screen information. Although lessening the probability of transcription error, this system remained labor intensive and time consuming. Full images were presented as a contact sheet attached to the report as an appendix, which often resulted in reports 20 to 30 pages long, an unde- sirable increase over the four to five page transcribed reports.

A new manual manipulation system was developed at this laboratory to streamline workflow, maximize the quality of product provided to the client, and improve timeliness of service. The system, consisting of hardware and software, allows the acquisition of excellent quality images from the cellular telephone display in an extremely reduced timeframe, using a digital video camera and computer workstation. The essential infor- mation from these images is then electronically imported directly into a report for the client. Risk of transcription errors has been removed with this system, and procedure refinements minimize the likelihood of data loss through inappropriate button manipulation. Furthermore, the system is not nearly as labor intensive and time consuming; now hundreds of images can be captured within minutes instead of over the course of hours as with the digital still camera. The markedly improved image quality allows the direct importation of image elements into a report for the client, and with the ability to select and extract only essential information from the images, to be displayed as linear text entries in a table format, report length is once again reduced to four or five pages. The critical element to the client, however, is that turnaround time for such an examination has been reduced from one week to one day.

Digital Evidence, Cellular Telephone, Forensic Science

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