Forensic Science And Technology Essay, Research Paper

Rape, murder, theft, and other crimes almost always leave a devastating mark on the victim. More often than not, it would be impossible to identify the perpetrator a crime without forensic science and the technology it uses. Forensic science allows investigators to unmask the secrets of the crime scene. Evidence gathered at the crime scene helps to identify the guilty party, murder weapon, and even the identity of the victim (Harkawy, 1991: 276). The new technologies enables the forensic experts to have better and faster access to accumulated information, to be more accurate in the identification of victims or delinquents, and minimizes the possibility of wrongful accusations. New technology has improved the methods and techniques that forensic scientists and law enforcement investigators use, in order to provide a safer environment for other people.

Information technology is one of the most important aspects in forensic science. It is very important for the forensic experts to receive the undisturbed evidence, such as fingerprints left at the crime scene, as quickly as possible, for more accurate readings. Thus using space technology, such as satellite communication, enables the forensic experts to “gather and digitize evidence at the crime scene, enter it into an on-site computer, and beam the data to a crime lab for swift analysis” (Paula, 1998: 12). Therefore, due to the use of this technology, forensic experts in laboratories can examine the evidence in short time, and the possibility of damage or unlawful manipulation of the evidence before the trial is minimal (Paula, 1998: 12).

More often than not, “criminals” wear gloves at the time of the crime, thus to obtain a fingerprint can be a difficult task. However, they may leave footprints behind, which “are often left in unusual places, such as a window ledge, in a flower bed or on a piece of furniture (May, 1993: 18). Computerized databases allow “unskilled” police officers to search the “national database of footwear” for important information, such as shoe manufactures, or evidence that links the footprint to marks from other crimes scenes. This “footwear database” enables the investigating officers to gather evidence against the accused much faster and it is also saves precious time ( May, 1993:18).

One of the oldest forms of identification is the use of fingerprints and with the use of today’s technology, many corporations can use this type of technology to help prevent various frauds. For example, in the mid 1990’s Metro Toronto’s Human Services Committee (MTHSC) proposed the use of a finger- scanning system in order to prevent welfare fraud. People applying for welfare would have to place their index finger on a scanner. If their prints did not match those of someone already receiving benefits, they would be eligible for a debit card, which would allow them to withdraw monthly payments from any bank machine. This type of technology is not in use just yet, but it is available and would minimize welfare fraud (Sternbergh, 1996: 64).

Computers are also highly used in forensic science. For instance, computer forensic, also referred to as forensic computer analysis or computer examination can be used in finding the evidence for white collar crimes. Many computer forensic experts can recover data from Computer Processing Units (CPUs) and software, which may have been manipulated with by someone, who wished to destroy the evidence. After the data is retrieved and interpreted by the computer forensic expert, the evidence can be used in a court of law (“Computer,” 1999).

On the contrary, computers can also benefit those people, who want to enrich themselves through fraud. White collar crimes are, more often than not, very hard to detect because “the globalization of the economy and information technology such as electronic money transfers have eased the path for the fraudster” (“Forensic,” 1996: 12). Therefore, forensic accountants’ expertise has been used by many corporations, in order to detect individuals, who may be engaged in white collar crime. Forensic accounting is “a discipline that deals with the relation and application of financial facts to legal problems” (“Forensic,” 1996: 11). Due to their investigative and financial experience, forensic accountants are often needed in the investigation of fraud such as “credit card fraud, false financial statements, false invoices, manipulation of cheques, and phantom vendors” (“Forensic,” 1996: 11-12).

Also, a new and useful investigative technique is called forensic computer animation, which has emerged due to increases in computer technology. This computer forensic animation can re-create a crime, such as homicide or assault, thereby allowing the judge and the jury to see for themselves the seriousness of the crime. This new technology “has the persuasive power to convict or acquit the accused” (Hawaleshka, 1995: 60-61).

Deoxyribonucleic acid (DNA) technology is widely use in forensic science. This new DNA technology is a powerful form of genetic “fingerprinting,” because the potentially indisputable crucial evidence is now available at a microscopic level (Grossblatt, ed., 1996: 10). Stored in the nucleus of human cells, DNA contains the genetic code that governs a persons life and every human’s DNA is as distinctive as his or hers fingerprints; with the exception of identical twins, whose genetic material is the same. DNA evidence extracted from blood stains, saliva, semen, hair, and other bodily substances, can positively link the person to the scenes of the crime; yet it can also prove the person innocent (Grossblatt, ed., 1996: 10).

Another more accurate, time and money saving technology is the new computer program for analyzing blood stains. This new technology allows the investigators, with the assistance of “laptop computers and printers,” to analyze blood stains without ever leaving the crime scene. Therefore, this innovation enables the investigators to “catch the bad guy faster.” The program is also 80 per cent more accurate than the older method of “taping strings to blood marks on the wall,” which was very time consuming and not accurate (“Gruesome,” 1997: 8).

Moreover, X-ray technology allows the forensic scientists to identify the victim through dental X-rays. Many victims’ bodies that are found may be beyond recognition, due to some horrible mutation of the body or by decomposition. However, “a forensic odontologist” can identify the victims’ identity through dental X-rays records, in order to speed up the investigation (Brady, 1997: 26). The investigators may then be able to link the guilty person to the victim, and thus prevent the accused from committing a similar crime.

A computer program called Aldus Photostyler is another new technological innovation, which is used in the case of missing people. Children and youths go missing every day and are often not found untill years later. However, with this new technology experts can age the photos of missing children, in order to identify them in later years. On the contrary, this program can also be used to make the face on the picture look younger for “war-crime investigations” (“Gruesome,” 1997: 8).

Moreover, today’s technology also allows for the police investigators to have a faster and more reliable connection between the crime and “criminals.” Many crimes are of such a horrific nature, that police investigators need Violent Crime Linkage Analysis System (ViCLAS) database to have that connection. ViCLAS is a database that “indexes homicides, sexual assaults, human remains and missing persons and identifies links between solved and unsolved crimes” (“Looking,” 1996: 15). Therefore, through ViCLAS, investigators are able to make a connection between the criminals already categorized in the database and new crimes. This allows the investigators to solve the crime faster, capture the criminal, and thus protect the general public.

Moreover, one of the interesting branches of forensic science is forensic geology and the technology it uses for comparing soil, minerals, building insulation, concrete blocks, and other particles or earth samples.. Many crimes may happen in the middle of the night, where there may be no witnesses, thus even soil samples can lead the investigators to the suspect. There are many different varieties of soils and building materials, and each has its own characteristic; therefore, no soil is the same (Murray & Tedrow, 1975: 72, 90). For instance, many suspects do not realize that soil, floor or wall particles could often be found in the clothing that they wore during the crime. Thus, once particles, from suspects’ clothing are compared with the particles from the crime scene, it can be used as a reliable evidence in a court of law (Murray & Tedrow, 1975: 88-89).

The comparison of different minerals, soils and building materials is often difficult, because some of the particles may be too small to compare it with just an ordinary microscope; thus other methods are used. One of the most commonly used methods is petrographic microscope. This microscope “has filters capable of polarizing the light, a rotating stage, and attachments for viewing the characteristic effects on light that has passed through minerals” (Murray & Tedrow, 1975: 40). Other technological innovations used in forensic geology, such as electron microscope and scanning electron microscope (SEM). These instruments enable the forensic geologists to “examine particles enlarged over 1,000,000 times, thus permitting identification of small mineral particles sometimes adhering to the surface of a larger mineral grain” (Murray & Tedrow, 1975: 42). However, the most commonly used technique that can be used to compare and identify different particles is X-ray technologies (Murray & Tedrow, 1975: 41). Therefore, even minute samples of soil, mineral, or other geological particles can give the investigators a “lead” to the suspects and provide evidence strong enough to put them behind bars.

However, some defendants may plead not guilty on the basis of insanity, in order to avoid punishment; it is then important for the court to order psychologists to critically evaluate the mental state of the defendant. There are many tests and techniques psychologists can use to determine the mental health or illness of the defendant. However, in today’s technological world, many psychologists have the advantage of using “computer technology for psychological assessments,” which are more “accurate and consistent in the scoring and the implementation of specific decision rules for deriving interpretive statements” (McCann &Dyer, 1996: 190). Therefore, many of the defendants, who do not want to take responsibilities for their actions, would not be able to pass the computerized and highly effective psychological tests, and would have to pay for their actions in correctional facilities.

Many crimes, however, may be committed by a person, who is mentally ill and cannot take responsibility for his/her actions. Thus, this person could plead guilty but be mentally ill (Rehkopf & Fisher, 1997: 144) It is also extremely important to have a proper medical evaluation of the defendants’ mental capacity and his/her responsibility for the crime. Neuropsychologists are the experts in this clinical field and they are able to determine the seriousness of the mental illness through various brain scans such as electroencephalogram (EEG), positron emission tomography (PET), and magnetic resonance imaging (MRI) (see Appendix 1) (Westen, 1996: 52-53). Thus, many defendants may not be responsible for their criminal actions due to various personality disorders such as schizophrenia, borderline disorder, depression, et cetera (Martell, 1996: 170-179).

Modern technology is very important in the field of criminal investigation. The application of today’s technology in criminal investigation allows the investigators to have faster access to any crucial information they may need, in order to solve the crime faster. Therefore, the faster they solve the crime, the criminals would have a minimal chance to strike again. Therefore, without the use of modern technology, it would be almost impossible to produce the best evidence to serve justice and protect the general public.

APPENDICES

Appencix 1:

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