Science & Justice 59 (2019) 678–679

Contents lists available at ScienceDirect

Science & Justice

journal homepage: www.elsevier.com/locate/scijus

Professional practice

Cross disciplinary collaboration in the current market place

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1. Introduction

In recent years there has been both an explosion in digital evidence and in police procurement arrangements that have led to traditional forensics being purchased as defined products. Although crimes may often include both traditional and digital evidence opportunities, collaboration between experts from different fields is now almost non-existent. Gone are the cross discipline teams that were once part of the Forensic Science Service where senior Forensic Scientists had a working knowledge of different forensic areas and gave advice on the most probative evidential options in the context of the case. These considerations now reside with the Senior Investigating Officer (SIO) and their respective scientific support manager. Is it reasonable to expect them to have a full grasp of forensic capabilities and limitations in every discipline? Does it encourage an over-reliance for example, on DNA profiling and fingerprint comparison, which are straight forward to commission, rather than necessarily the most probative?

Whilst specialism appears a natural progression as scientific areas develop, in our view there remains an important role for collaboration between experts in devising a cost effective forensic strategy and providing the most probative evidence in the context of the case.

2. Collaboration in the current forensic market

At one level, collaboration may be to determine the order in which forensic examinations take place to prevent forensic opportunities being lost. Some may be self-determining: for example the digital recovery of text messages that are passed for interpretation to someone specialising in drugs terminology. Others are more complex; for example the investigation of a serious road traffic incident. The options include forensic engineers examining the vehicle and incident locus, forensic biologists undertaking DNA testing of samples recovered from air bags to establish the driver, digital practitioners may analyse recovered mobile phones, satellite navigation devices and infotainment systems for evidence of distractions at the time of the collision, if available CCTV or dash cam footage surrounding the time of the incident could be enhanced and evaluated by imagery specialists, and finally, toxicologists may evaluate the results of testing recovered samples for drugs and alcohol. The case circumstances will then dictate which of these routes is likely to be the most probative, whilst ensuring other forensic opportunities are preserved in case they need to be followed at a later date. Some of the examinations will be destructive for other types of evidence, and it is only through working together can all the parties agree the appropriate forensic strategy to minimise this risk and maximize evidence recovery. Evidence types that may have become less popular in recent years such as fibre evidence must not be ignored, as it may become relevant during cold case reviews in the future due to developments in technology and science. The loss of skilled scientists in such areas, an issue acknowledged by the Forensic Science Regulator in her Annual Report for 2018 [2] and the House of Lords Science and Technology Select Committee in their report on forensic science[4], makes this level of engagement across all disciplines increasingly difficult.

Cross-disciplinary collaboration can also help in understanding the limitations of forensic evidence. All expert evidence is subject to the Criminal Procedure Rules Part 19 and its associated Practice Direction. The factors that should be taken into consideration in assessing the reliability of expert evidence of any discipline are set out in part 19A.5 of the Practice Direction. The first 3 factors are:

(a) the extent and quality of the data on which the expert's opinion is based, and the validity of the methods by which they were obtained;
(b) if the expert's opinion relies on an inference from any findings, whether the opinion properly explains how safe or unsafe the inference is (whether by reference to statistical significance or in other appropriate terms);
(c) if the expert's opinion relies on the results of the use of any method (for instance, a test, measurement or survey), whether the opinion takes proper account of matters, such as the degree of precision or margin of uncertainty, affecting the accuracy or reliability of those results;

Furthermore, in 19A.6, it is clear that it is the courts responsibility to 'identify potential flaws' in the scientific opinion before them. Examples of areas for consideration are also provided including: flawed data, unjustifiable assumptions and ascertaining the completeness of the information available. In the example of the road traffic incident discussed above, it is difficult to see how an expert could fully comply with these directions without an understanding of the forensic

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https://doi.org/10.1016/j.scijus.2019.07.002
Received 28 January 2019; Received in revised form 2 July 2019; Accepted 6 July 2019

principles in the other disciplines.

The Criminal Procedure Rules Part 19 and associated Practice Direction[1] help the Court to understand where on the reliability spectrum evidence sits. Traditional forensics have been grappling with limitation questions for many years but the rise in Streamlined Forensic Reporting has hampered the reliable presentation of both traditional and digital forensics evidence. All too often the SIO is presented with test results without the accompanying evaluation of what the result means in the context of the case. For example, in mobile phone cases, there seems to be a widespread misunderstanding that they are examined in the same way as computers where the starting point is that a forensic image is made of all the data on the hard drive. By contrast, we frequently see statements by SIO's based on results of examinations of mobile phones that they erroneously believe to have considered all the data on that device. The amount of data recovered depends upon the type of mobile phone examination undertaken. Similarly a DNA profiling result can be compelling evidence in one case but evidentially worthless in another.

3. Encouraging a collaborative environment

In order to facilitate collaboration, the investigative process should become a two-way flow of information rather than the conveyer belt approach of one person providing limited information to the next. Organisations could review their structure to remove barriers between departments. Allowing direct collaboration between experts in different disciplines can lead to better outcomes than that which can be delivered when only a single person has visibility of the whole case. The novel partnership between East Midlands Special Operations Unit (EMSOU) and Cellmark Forensic Services[3] is an interesting development: by placing forensic scientists directly with the Police, they are attempting to remove some of the barriers between the Police and Forensic Service Provider, encouraging a closer working relationship. This allows officers to work directly with forensic scientists to identify the most probative forensic strategy given the case circumstances and protect potential forensic investigation avenues for possible alternative forensic work at a later date. The forensic scientist working alongside the investigating officer can help with the overall forensic picture, which can be absent in the current provision of a number of forensic experts reporting on just the individual submission they have examined. In complex cases, this should lead to reduction of cost to the public purse by improved overarching evaluation of forensic evidence in the case context as the investigation proceeds. The forensic scientist can assist particularly with limitations of evidence in different case circumstances and by suggesting other less obvious but perhaps more useful avenues to be explored. A targeted approach, with input on evaluation in the case circumstances, as to which items need examined, should help the efficiency of the gathering of forensic evidence. The forensic scientists also benefit from further learning regarding the investigative process. It will be interesting to see how this approach develops.

Cross disciplinary training can also play a large role in encouraging effective collaboration. As in many other industries as they develop, it is inconceivable that every expert can be an expert in all disciplines; a digital expert would not be expected to understand the minutiae of DNA evidence and vice versa. This is not however, the aim of such training. If a forensic examiner is not aware the capability of other disciplines, they are unlikely to identify situations where a colleague may be better placed to further the case. Cross disciplinary training should supplement the training required to become an expert in a given discipline.

It is in the investigative stage where we have found cross collaboration between disciplines to bring the most benefits. Perhaps it is no more than a different approach or experience that means that a conversation with a colleague sparks a more probative investigation.

Forensic science should not just be about processing evidence and producing a result but about investigating the case as a whole. Encouraging the next generation of forensic scientists to consider the big picture and the probative value of a potential piece of evidence, even when that evidence might be outside their own skills, is the first step in identifying how to involve other disciplines.

4. Recommendations

1. Supplementary cross disciplinary training should be undertaken, including at the investigative stage, to maximize the identification of cost effective and probative evidential opportunities.
2. In-house knowledge sharing should be encourage in organisations. Internal presentations are a useful tool in ensuring experts are aware of capabilities in other disciplines.
3. Inter-organisational structures should facilitate direct collaboration between experts as well as through the SIO who is responsible for bringing together the evidence.
4. The capabilities and mechanisms for cross disciplinary collaboration should be factors taken into consideration in forensic procurement.

Declaration of Competing Interest

I am employed by Keith Borer Consultants (a division of Orchid Cellmark Ltd), which provides forensic services to the market which is discussed in this paper. It should be noted that this paper refers to the relationship between EMSOU and Cellmark Forensic Services; whilst Cellmark are the parent company of Keith Borer Consultants, I have no direct connection with the EMSOU collaboration.

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