1. Introduction to The Knowledge Transfer Network Forensic Science Special Interest Group (FoSciSIG)

1.1. The Knowledge Transfer Network (KTN) guides businesses in reaching the potential of their creativity, ideas and new discoveries – ultimately leading to strengthening of the UK economy through these innovations. KTN combines in-depth knowledge in many sectors with the ability to cross boundaries.

1.2. Special Interest Groups are KTN projects that focus activity and accelerate innovation in cross-disciplinary topics of strategic importance. KTN’s Special Interest Groups are time-bound activities that typically achieve their objectives over a small number of years and are then replaced by new higher-priority areas of focus.

1.3. The KTN Forensic Science Special Interest Group (FoSciSIG) was created at the recommendation of Professor Bernard Silverman in his review of Forensic Science Research. Since 2012, the FoSciSIG has produced a number of reports on a variety of topics including 'Taking Forensic Research and Development to Market' which continues to be a valuable source of information for those wishing to enter the forensic market with new innovation.

1.4. Whilst funding for the FoSciSIG was withdrawn in line with the KTN policy on SIG’s in 2018, it is recognised by the KTN that the facilitation of ongoing communication with the forensic community is necessary given the interdisciplinary nature of forensic science, the sensitivity and potential complexity of the judicial system, its use of forensic science, and the breadth of stakeholders. As such, the KTN has assigned a Forensic lead, working 1-day per week in this area and a steering group with independent Chair is still in place.

1.5. The KTN maintains the Forensic Science UK Innovation Database, a tool for anyone looking to undertake a research and development project that has an application in forensic science. The database was designed to promote targeted research. However, limitations exist with the database. For example, it is not possible to identify if anyone is actively working on any of the challenges or the extent of the research being undertaken.

2. Sustainability of the Forensic Marketplace

2.1. The FoSciSIG has great concerns over the sustainability of the forensic marketplace in England and NI. Retendering of contracts often

2 https://ktn-uk.co.uk/perspectives/forensic-science-uk-innovation-database
results in a change in forensic service providers (FSP’s) and with this, the loss of experienced forensic scientists in key areas, who struggle to live with this level of uncertainty within their careers. The competitive marketplace has driven down costs to the point where providers are struggling to cover the cost of delivery with small providers being forced out of the marketplace and larger companies being squeezed financially. This has also significantly affected the amount of research being undertaken within the industry.

2.2. The loss of a FSP withdrawing from the market or worse, collapsing would have huge impacts on the investigation of crime. Backlogs would develop, the Government may have to step in finally and more importantly, the public would lose faith in the value of forensic science to the Justice system.

2.3. Many police forces have moved to developing their own in-house provision of some forensic services. It would be interesting and helpful to know the true cost of in-house provision versus that currently delivered by a FSP to ascertain whether savings are being made. It could be argued that police in-house provision may not be truly impartial in nature because it is cited, paid for and delivered by police employees and as such subject to contextual influence and bias.

2.4. Within volume crime, physical trace evidence types (such as glass, paint and fibres) that may be of value to the investigation are generally not sent for forensic analysis due to the cost; this drives behaviours and policies not to routinely collect such trace evidence types. This impacts on maintenance of competence in accredited organisations adding to costs, impacting further on the financial position of providers. Inevitably if this is allowed to continue, will lead to skill shortages in once traditional areas of forensic science.

2.5. Changes are required to ensure the sustainability of the forensic marketplace and market management. As such a greater lead from within Government, the Home Office, the Ministry of Justice or the wider judiciary resulting in the appointment of a Forensic Commissioner is recommended.

3. Contribution of forensic science to the delivery of justice in the UK

3.1. The FoSciSIG strongly believe that forensic science does make a valuable contribution to the delivery of justice however it also accepts that measuring such contributions with any precision is challenging. The usefulness of forensic science to quickly eliminate the innocent or support a successful prosecution by the CPS is sometimes reduced either by limitations in resources, budgetary constraints or effective communications between the judiciary and police in terms of understanding the value of forensic evidence within the case.

3.2. However, we have witnessed a Paradigm Shift over the last few years, as forensic science capabilities are used for security, economic and influence purposes, and its scope has also resulted in a closer synergy
with technology - these are activities that do not always result in criminal justice outcomes.

3.3. Therefore, its weakness is that the forensic science contribution and benefits are not fully recognised, and the scope of research opportunities are not fully realised.

3.4. By continuing to discuss the use of forensic science purely within the context of the criminal justice system, the government and public will never understand the true contribution. It would be helpful for forensic science to also be measured against the three national security objectives; to protect our people; to project our global influence and to promote our prosperity rather than just supporting justice.

3.5. The growth of forensic science and societies dependency upon it, means that there is a need to review and challenge the national leadership, oversight and governance across this wider forensic science landscape. To provide more national cohesion, dedicated strategic leadership and alignment with other government departments is needed.

3.6. At present, the UK suffers from a lack of clear leadership, oversight and governance across the wider forensic landscape. A fragmented and weakened marketplace, lack of funding for forensic research supporting the evidence base and a silo approach to forensics in some regions could impact on the national UK forensic communities’ ability to support the current and future needs of the UK judicial system.

3.7. Collaborations between police forces and academia including the national FIT-IN led by Portsmouth University, regional such as Yorkshire and Humber Police with their local universities, the Scottish Police Authority (SPA) with Scottish universities and local collaborations including Lancashire and the University of Central Lancashire (UCLan), are key to ensuring the focus of research priorities at a local level but more should be done to coordinate meaningful research that reaches the marketplace at a national level. Drivers for change at national level such as the ‘Transforming Forensics’ programme, the FoSciSIG challenges database, NPCC Science and Innovation Board and networking organisation’s committed to developing professionals including the Chartered Society of Forensic Sciences, all support the UK commitment to enhancing the wider role of forensic science and those working in this area.

3.8. UK oversight mechanisms such as the roles of our Forensic Science Regulator and Biometrics Commissioner are seen as strengths within the UK landscape. However, without a single body to co-ordinate all these elements, the UK landscape will remain fragmented due to the complex interdisciplinary nature of forensics.

4. Understanding and use of Forensic Science in the Criminal Justice System

4.1. It should be recognised that when discussing ‘forensic science’, this encompasses a set of sciences and not one coherent discipline. This in
itself may be problematic with no single subject being ‘forensic science’, rather any subject which has the potential of being given in evidence to assist the courts of law.

4.2. The current evidence base is derived from research and the practitioners experience applying the techniques to forensic investigations. Limitations in research may not be apparent until that technique is scrutinised in the courtroom setting. New and novel techniques suffer from a lack of background data and there is a need for the development of ground truth databases and wider data sharing agreements to support research. In turn this supports the overall evaluation and interpretation of the information to aid the investigator and ultimately the courts of law. In addition, commercial sensitivities around such activities in the marketplace compete with these ideals.

4.3. There must be a robust evidence base for all forensic use within the CJS supported by good quality research, with the CJS itself leading on scientific requirements. Evidence gaps are apparent in a number of areas including the behaviour and persistence of physical trace evidence types and the impact of the behaviour of the forensic examiner.

4.4. Comprehensive oversight, scrutiny and validation of new forensic technologies must be in place, particularly in relation to greater automation. This should include provision of appropriate standards, good practice, technical requirements, proficiency testing and legal enforcement.

4.5. Communication across the judiciary needs improvement. The FoSciSIG suggest it would be valuable to have access to a common platform that all CJS parties can use including areas for official sensitive communications and this potentially should extend to communications with Home Office policy professionals. A commitment from the wider judiciary to communicate with scientists would be welcomed and would facilitate better understanding of the roles and pressures of all involved.

4.6. It is recognised by FoSciSIG members that understanding of forensic science varies within the wider CJS, with knowledge often being built by those who have actively been involved in a particular case which identified a specific physical evidence type as key evidence or due to the individual wanting to develop their own knowledge base. There would benefit the wider CJS having increased access to guides on various evidence types available to build knowledge.

5. Standards and Regulation

5.1. Accreditation whilst welcomed by the FoSciSIG, as it ensures that policies and processes are followed and documented, does not however stop rogue practitioners as seen in the Randox incident. Accreditation does not generate national best practice and it is possible to accredit work of a standard lower than that expected by our criminal justice system.
5.2. Organisations can achieve accreditation if they have the finances available, but cases are seen where some are choosing not to accredit certain procedures because the cost is too high.

5.3. Many SMEs find the cost of accreditation prohibitive and as such, are unable to enter or compete in the forensic marketplace. More needs to be done to ensure that innovation is able to enter the marketplace moving forward. The Chartered Society of Forensic Sciences is attempting to address this shortfall by enabling SMEs to share resources to support their accreditation but further support to SMEs would be welcomed.

6. Role of the Forensic Regulator

6.1. The FoSciSIG believe the role of the FSR to ensure quality and transparency such that an evidence base behind existing processes is in place and the integration of outputs within the wider CJS is correct. The FoSciSIG firmly believe that role will be enhanced with statutory powers, to ensure that those failing in their duty are held to account by having the power to stop work continuing following non-compliance or failure to maintain accreditation. However, we appreciate this this itself is not without risk to the forensic marketplace and any sanctions should be considered carefully.

7. Use of forensic science in NI, Scotland and Internationally

7.1. The Forensic Provision in both Scotland (SPA) and NI (PSNI) have a central forensic services capability within one laboratory which negates the requirement to deal with regional contracts. Scotland share location with the judiciary which facilitates the ability for closer working relationships. NI is itself much smaller (for example it is smaller than the Yorkshire and Humber consortium that has its own forensic service provider on site). However, both SPA and PSNI do routinely sub-contract some of their services. It would be interesting to ascertain whether their models could be scaled up and applied to forensic services within England and Wales.

7.2. There are lessons that can be learned from international and European forensics. In Australia and New Zealand, there is a clear approach to forensic research adopted via the Australia and New Zealand Police Advisory Agency\(^3\) (ANZPAA). Under this organisation, there is an executive committee, working groups and advisory groups. ANZPAA also co-ordinate the research and innovation strategy programme which includes capability development and assessment of emerging technologies. A structure similar to this should be considered for the UK and the FoSciSIG could play a significant role in this respect.

7.3. Within the EU there are clear examples of good practice including the ENFSI best practice manuals\(^4\), the Netherlands approach to teaching, research and practice facilitated by the National Forensic Institute and

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the culture that anticipates technological advances (for example in phenotyping).

8. Forensic Science Research Landscape

8.1. ‘The whole research arena is currently very uncoordinated and not sufficiently integrated. Universities can support forensic science development, but coordination is essential to minimise duplication and ensure the appropriate areas are explored (62, para 196)’. Sadly, this is still true some 7-years later.

8.2. The FoSciSIG would welcome a structured and integrated approach to the forensic R&D landscape within the UK. Bringing together the UK community for innovation in a more cohesive manner will allow end users access to better tools in the judicial system that meet their requirements, that the research community knows what users need and, therefore, have a better chance of securing funding and a successful outcome for their research, and that technology developers and equipment manufacturers have a link to both forensic science providers and the UK’s research capabilities potentially enhancing routes to market.

8.3. The development of forensic research hubs that focus on specific evidence types, funding specifically targeted to current challenges identified by Government and formalised collaboration between academia, industry, research councils and end users would be useful. The ability to anticipate the opportunities and threats of new technologies and act upon such would be beneficial. The availability of biometric and other physical evidence types datasets that can be used for research purposes would be welcomed.

8.4. Funding should be allocated to those areas of forensics where the need has been identified by the judiciary or where there is currently a lack of evidence supporting specific evidence types including biometrics and digital tools that apply machine learning. If strength of evidence is currently sufficient to meet the needs of the CJS, funding should be prioritised to areas where the need for further research is fully justified.

8.5. The FoSciSIG would support the development of a forensic steering group at a senior level that had oversight of research priorities. This should include UKRI, Home Office, researchers and members of the wider CJS.

9. Digital Forensics

9.1. Sadly, given the complexities of this area of forensics, the SIG are unable to comment on this area within such a limited wordcount. This area of forensics requires a more in-depth review to ensure the current and future needs of the CJS are met within the changing and dynamic nature of this area.

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5 https://publications.parliament.uk/pa/cm201012/cmselect/cmsctech/855/855.pdf