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Educating judges, prosecutors and lawyers in the use of digital forensic experts

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A B S T R A C T

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Recent years have seen an exponential growth of evidence in digital forensic investigations. Digital Forensics (DF) experts are predicting, amongst others, a 'digital explosion' of ransomware in the coming years. The legal community must be prepared to deal with an increase of digital evidence in both volume and complexity. In cooperation with experts in the field, the Netherlands Register of Court Experts (NRGD) has recently developed standards and registration requirements for DF experts in the Netherlands. This article describes how these standards were established and provides insight into the requirements that a DF expert should meet to qualify as an NRGD registered expert. Registration is now open to all DF experts, both Dutch and non-Dutch. Furthermore, this article can be used by DF experts worldwide to educate judges, prosecutors and lawyers that make use of their reports. It illustrates what the legal community can expect from DF court experts, it provides a demarcation of the DF field based on DF literature and it presents examples of relevant questions that can or should be asked to a DF expert.

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Introduction

Last year the world was shocked, again, by the outbreak of ransomware viruses (Wikipedia, 2017a, 2017b). The ransomware took files "hostage" from users on thousands of computers. In return for payment of a ransom the files were unlocked. However, payment does not necessarily guarantee decryption of the files. Digital forensics experts are predicting a "digital explosion" of ransomware this year (Hayter, 2015). The Dutch National Cyber Security Centre (National Cyber Security Centre, 2016) and the FBI are warning that the number of ransomware incidents continues to grow as individuals and organizations fail to take precautionary measures (FBI, 2016).

The warnings suggest that digital evidence continues to grow exponentially in investigations and prosecution of suspects. Not only in advanced cybercrime investigations, as in, ransomware investigations, but also through the use of digital forensics in homicide cases where the suspect's smartphone is examined for forensic purposes. Smartphones and other portable "wearable" electronics leave digital traces that can be linked to persons and

locations. The exponential growth of digital traces, as well as the expansion of cybercrime, and digitization of investigative methods represent significant changes to society and lead to a broadening horizon of digital investigation (Casey, 2017).

In its triennial report, the Dutch expert group on "Forensic Research and Innovation" views digitization in investigations as a "major development" (Expertgroep Forensisch Onderzoek en Innovatie, 2016). The expert group describes the above mentioned exponential growth of digital traces, as well as the expansion of cybercrime, and the digitization of investigative methods as significant changes to society.

Prior to formulating its registration requirement, the Netherlands Register of Court Experts (cf. Table 1 below) conducted a survey among forensic experts and users of expert reports (e.g. judges, public prosecutors and lawyers) in 2014. The response showed that forensic experts and users of expert reports highly favour the introduction of Digital Forensics as a new field of expertise. Because of—amongst other things—the rapid developments in digital forensics as well as the survey results, the Board of Court Experts decided to set standards for the field of expertise Digital Forensics in 2014.

In this article, we will explain how these standards were developed in the Netherlands. In addition, we aim to inform the future users of expert reports, such as judges and lawyers, what

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Table 1
The NRGD explained.

The NRGD

The Netherlands Register of Court Experts (Nederlands Register Gerechtelijk Deskundigen, NRGD) (NRGD, 2015) was created in response to government legislation entitled "Experts in Criminal Cases Act". This Act took effect on 1 January 2010 and sets legal requirements for the quality, reliability and competence of experts. The NRGD is the first register of experts with a legal basis and an independent status, which also receives structural public funding. The NRGD is headed by an independent Board of Court Experts (the Board). The Board has seven members, including three scientists and one member for each of the groups using the register: the Judiciary (the Chair), The Public Prosecution Service, the Police and the Defence.

Various fields of expertise

The register is open for applications in various fields of expertise, including: DNA analysis and interpretation, Forensic Toxicology, Forensic Weapon and Ammunition Examination, Forensic Psychiatry and Psychology and Forensic Pathology. Several new fields of expertise will be added to the register in the coming years. Recently, the NRGD set standards for the field of expertise of Legal Psychology.

The NRGD in numbers:

- >1000 applications received for registration and re-registration
- 80% of applications leads to registration-20% rejection
- 550 registered experts
- 58 objections to NRGD decisions
- 6 court appeals to NRGD decisions

standards the NRGD requires court experts in Digital Forensics to meet, and what these users can expect from a registered expert. Before doing this we will outline related developments in other regions.

Setting standards for digital forensics

The NRGD Standards on Digital Forensics and application instructions were published on the website of the NRGD (NRGD, 2015) in 2015. This paragraph explains how these standards were set.

Subfields

The first meeting of the Advisory Committee for Standards (ACS) Digital Forensics was held at the end of 2014. An ACS consists of (international) experts in a particular field of expertise and a lawyer. During these meetings, the committee determines the demarcation of the field of expertise. The major question for the ACS Digital Forensics was to decide what activities were to be included in the demarcation and to define the boundaries of the field of expertise.

Over the past twenty years, a variety of articles has been published about digital forensics demonstrating that the field consists of a wide range of specialisms (e.g. (Henseler et al., 2000; Henseler and Siegel, 2000)). There is no such thing as an all-purpose "Digital Forensics expert". On the contrary, the field of expertise is divided into different subfields. The committee has based the categorization, among other things, on a recent ontology by Karie & Venter (Venter (2014)). At the top level they distinguish six categories that are broadly defined, in consideration of the rapid developments in this particular field of expertise. A more narrowly defined list of (sub) specialisms for the Digital Forensics experts would risk being out of date when it was published.

Consultation

The process of setting standards for various fields of forensic expertise in general is demonstrated in Fig. 1. After the meetings of the Advisory Committee for Standards, a preliminary draft was formulated. This draft was subsequently published in the NRGD newsletter and on the NRGD website with a call for comments to digital forensic experts.

Additionally, the NRGD has also proactively approached experts to express their views. In 2015, the NRGD presented the preliminary draft at the annual European edition of the Digital Forensic Research Workshop (DFRWS) conference in Dublin. During this

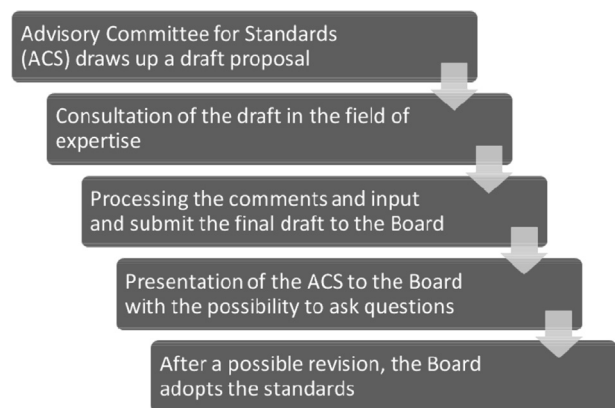


Fig. 1. Process of setting standards per field of expertise.

meeting, the NRGD not only received comments from Dutch experts, but also from foreign experts from countries including the United States, Italy and South Africa. These comments were incorporated into the final draft that the Advisory Committee for Standards (ACS) submitted to the Board.

Establishment of standards for digital forensics and assessment of experts

The Standards Digital Forensics were finally codified by the Board of Court Experts in June 2015. Digital Forensics experts are assessed by the Advisory Committee for Assessment (ACA) on the basis of these standards. The Board has appointed experts from various countries as members of the ACA including the Netherlands, Germany, Italy, the United Kingdom and South Africa. Aspiring experts are informed of the requirements for the assessments by means of a workshop. Each application for registration is reviewed by a committee of at least three members consisting of two field experts and a lawyer. The lawyer is not necessarily knowledgeable on the field of expertise but is an expert on relevant Dutch (case) law and also has experience with assessments of experts in other fields of forensic expertise. For each application the ACA completes an advisory evaluation form and presents its recommendation to the Board.

The NRGD has so far received nine applications for registration for the new field of Digital Forensics. The assessments took place in July and December 2016. In total eight applicants have been registered and the registration of one applicant is on hold. These first applicants all practice digital forensics in the Netherlands. A

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