

Expert Evidence and Digital Open Source Information

Bringing Online Evidence to the Courtroom

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Abstract

Digital open source information (DOSI) has emerged as a significant source of evidence for the International Criminal Court ('the Court') and other jurisdictions applying international criminal law. However, its use in litigation raises questions about who can be considered an expert in DOSI and what methods and safeguards they should adopt. This article examines how the Court can receive DOSI via expert evidence while maintaining rigorous fact-finding standards. It addresses challenges that DOSI introduces to the paradigm of expert testimony, including the lack of an overarching formalized system of DOSI accreditation, the typically group-based nature of DOSI investigations and the scope for misinterpretations and biases to result in erroneous conclusions. It proposes a novel six-factor test for the Court's identification of sufficiently qualified DOSI specialists as expert witnesses. At the same time, it highlights that DOSI specialists should utilize transparent, accessible and replicable methodologies, with quality control feedback loops, peer review processes and bias controls. The aim of the article is to facilitate the use of DOSI evidence to resolve atrocity crimes cases, while also maintaining rigorous fact-finding standards and conforming with due process and fair trial rights.

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1. Introduction

Let there be no mistake. As science continues to change the social world, great transformations of factual inquiry lie ahead for all justice systems. These transformations could turn out to be as momentous as those that occurred in the twilight of the Middle Ages, when magical forms of proof retreated before the prototypes of our present evidentiary technology.¹

The use of digital open source information (DOSI)² raises fundamental questions about the normative framework governing expert witnesses before the International Criminal Court ('ICC' or 'the Court'). In particular, the increasing prevalence of DOSI in ICC proceedings demands scrutiny of the definition, role and methodology of the expert witness.³ Unlike regular witnesses,⁴ expert witnesses are permitted to testify about matters that they did not experience in

1 M. Damaška, *Evidence Law Adrift* (Yale University Press, 1997), at 151.

2 DOSI is digital information available on the internet, which 'any member of the public can obtain by request, purchase or observation'. Y. McDermott, A. Koenig, and D. Murray, 'Open Source Information's Blind Spot: Human and Machine Bias in International Criminal Investigations', 19 *Journal of International Criminal Justice (JICJ)* (2021) 85–105, at 86. When DOSI is collected for use as evidence, it can be termed digital open source evidence (DOSE). See A.W. Dutelle, *An Introduction to Crime Scene Investigation* (Jones & Bartlett Learning, 2016); L. Freeman, 'Digital Evidence and War Crimes Prosecutions: The Impact of Digital Technologies on International Criminal Investigations and Trials', 41 *Fordham International Law Journal* (2018) 283–335, at 297 citing A.R. Gonzales, R.B. Schofield and D.W. Hagy, *Digital Evidence In The Courtroom: A Guide For Law Enforcement And Prosecutors*, U. S. Department of Justice, January 2007, at 72; and R.B. da Silva, 'Updating the Authentication of Digital Evidence in the International Criminal Court', 22 *International Criminal Law Review* (2021) 941–964, at 941–942. DOSI can also encompass several other technologies, including (i) geospatial intelligence and remote sensing (GEOINT); (ii) online DOSI; (iii) financial intelligence (FININT); and (iv) documentation technologies. Various other overlapping terms are used for digital materials, such as open source intelligence (OSINT); L. Freeman, 'Prosecuting Atrocity Crimes with Open Source Evidence: Lessons from the International Criminal Court', in S. Dubberley, A. Koenig and D. Murray (eds), *Digital Witness: Using Open Source Information for Human Rights Investigation, Documentation, and Accountability* (Oxford University Press, 2020) 48–67, at 48–49. Open source information (OSI) and online audio-visual content (OAVC); D. Minogue, S. Allen and Y. McDermott, *Putting Principles Into Practice: Testing Open-Source Video as Evidence in the Criminal Courts of England and Wales, Lessons Learned From a Mock Voir Dire Hearing*, Global Legal Action Network and Bellingcat, 24 October 2022, available online at https://policycommons.net/artifacts/2962219/14ee1a_0cfff5b64a9684101a21f96f9e8af7c0a/3770345, §§ 2, 5. See also D. Minogue et al., 'Putting Principles into Practice: Reflections on a Mock Admissibility Hearing on Open Source Evidence', in M.L. Fremuth and K. Stavrou (eds), *International Criminal Law before Domestic Courts* (MANZ Verlag Wien, forthcoming; on file with authors). This article uses the term DOSI, as it covers a broad range of materials that may be relevant to international criminal proceedings, without restricting the category to video or images and without limiting it to intelligence materials.

3 DOSI will typically require expert evidence because of its technical and increasingly sophisticated nature; see below, Section 2.

4 Decision on the Prosecutor's Motion Opposing the Testimony of Witness DE4-30 as a Factual Witness, *Ndindiliyimana et al.* (ICTR-00-56-T), Trial Chamber II, 16 May 2007, § 9 ('[w]here a Party chooses to call such an individual as a factual, rather than an expert, witness it implicitly makes a choice to limit the witness' testimony to matters which he personally saw, heard, or experienced.').

person.⁵ This powerful role can have a major impact on the outcome of a trial, particularly in international cases where traditional crime scene evidence may be difficult to obtain.⁶ However, DOSI itself fits awkwardly with the approach of international tribunals towards expert evidence because (i) it challenges the binary distinction between experts and lay witnesses; (ii) its group-based ontology is incongruous with the traditional single expert paradigm; and (iii) its dynamic nature must be reconciled with the need for transparency and replicability.⁷

To redress the potential dissonance between DOSI and expert evidence, this article explores pathways for the Court to facilitate the receipt of DOSI whilst maintaining rigorous fact-finding standards. It addresses how DOSI specialists can mitigate the risks of their work being considered unreliable and/or inadmissible. Significantly, it proposes a novel six-factor test for the identification of DOSI specialists as expert witnesses.

The central thesis of this article is that a firm distinction between experts and lay witnesses should be maintained as part of the Court's normative architecture. This will serve the interests of reliable fact-finding and will strengthen the legitimacy of the ICC's determinations. At the same time, it is posited that the ICC (and other institutions applying international criminal law) along with the DOSI community, can make adjustments to their working methodologies to assist the investigation and adjudication of atrocity crimes. International courts can accommodate DOSI by establishing clear, objectively justified, accessible and non-biased parameters for the recognition of DOSI specialists as expert witnesses. For their part, DOSI specialists should utilize transparent, accessible and replicable methodologies, with quality control feedback loops, peer review processes and bias controls.

By examining the use of DOSI under the expert evidence framework, this article enters novel territory. It differs from previous assessments of expert evidence under international law, which have tended to focus on the more 'traditional' evidentiary materials presented before international courts such as blast analysis and DNA identification.⁸ Similarly, it differs from studies on DOSI, which have tended to focus on DOSI's probative value *in abstracto*, without assessing how it will be submitted into evidence before courts such as the ICC. Indeed, several leading publications on DOSI's role for atrocity crimes omit any

5 Judgment pursuant to Art. 74 of the Statute, *Bemba et al.* (ICC-01/05-01/13-1989), Trial Chamber VII, 19 October 2016, § 20 ('*Bemba et al.* Trial Judgment'). See also A. Appazov, *Expert Evidence and International Criminal Justice* (Springer, 2016), at 19; K.M. Richmond and A.P. Sebastiano, 'Between Fact and Opinion: The Sui Generis Approach to Expert Witness Testimony in International Criminal Trials', 22 *ICLR* (2021) 1016–1043, at 1017.

6 R. Wilson, *Incitement on Trial: Prosecuting International Speech Crimes* (Cambridge University Press, 2017), at 228. International trials frequently feature a significant number of expert witnesses. For example, the *Ongwen* trial saw eight expert witnesses provide testimony: Trial Judgment, *Ongwen* (ICC-02/04-01/15), Trial Chamber IX, 4 February 2021, §§ 594–602.

7 See *infra* Section 4.

8 Appazov, *supra* note 5, at 5–7.

mention of expert evidence altogether.⁹ Those which address expert evidence contain only limited analysis of the applicability of the framework governing expert testimony to DOSI.¹⁰ Even much-cited manuals on DOSI, such as the Berkeley Protocol on Digital Evidence, lack any detailed assessment of expert evidence in this respect.¹¹

Conversely, this piece sets out a thorough assessment of the normative framework governing DOSI evidence and of the challenges it presents for the ICC itself and for the DOSI community. Significantly, the present article makes a unique contribution to scholarship on international criminal justice by proposing a framework to determine who may qualify as a DOSI expert before the ICC. The framework consists of six criteria, which draw together guidance from jurisprudence, academic commentary and experience.¹²

The formulation of this framework for DOSI expert evidence provides an important resource for the Court's treatment of DOSI materials. Because DOSI is typically collected remotely by people who may have played no role in its creation,¹³ opinion evidence will be needed to explain and verify it, normally

- 9 See e.g. A. Koenig et al., 'Open Source Fact-Finding in Preliminary Examinations', in M. Bergsmo and C. Stahn (eds), *Quality Control in Preliminary Examinations*, Vol. 2 (Torkel Opsahl Academic EPublisher, 2018) 681–710; Freeman (2020), *supra* note 2, at 48.
- 10 See e.g. F. D'Alessandra and K. Sutherland, 'The Promise and Challenges of New Actors and New Technologies in International Justice', 19 *JICJ* (2021) 9–34, which focuses on digital information and its use for investigations by accountability mechanisms and contains passing references to expert findings in existing or closed cases, but does not analyse the role of experts in litigation at all; Minogue, Allen and McDermott, *supra* note 2, which discusses expert evidence and DOSI but only in the context of domestic proceedings under UK law; E. McPherson et al., 'Open Source Investigations and the Technology-driven Knowledge Controversy in Human Rights Fact-finding', in Dubberley, Koenig and Murray (eds), *supra* note 2, 68–86, which focuses on experts in human rights fact-finding without addressing the Rome Statute or Rules of Procedure or other legal procedures according to which these findings would be entered into evidence and relied on before international or domestic courts; A. Koenig and L. Freeman, 'Open Source Investigations for Legal Accountability: Challenges and Best Practices', in Dubberley, Koenig and Murray, *supra* note 2, 331–342, at 340–341, which makes passing reference to expert testimony on DOSI without addressing the ICCSt. or Rules of Procedure or other international legal rules.
- 11 See e.g. Office of the United Nations High Commissioner for Human Rights and University of California Berkeley School of Law, *Berkeley Protocol on Digital Open Source Investigations: A Practical Guide on the Effective Use of Digital Open Source and Information in Investigating Violations of International Criminal, Human Rights and Humanitarian Law* (hereafter the 'Berkeley Protocol'), 3 January 2022, § 213 (mentioning experts without engaging in detail with the relevant rules, principles, jurisprudence, and practice); Interpol, *Global Guidelines for Digital Forensics Laboratories*, May 2019 (containing a short section on expert witnesses, but of less than half a page with no references to literature, jurisprudence or even any legal provisions); and J. Drake and T. Harris, *Geospatial Evidence in International Human Rights Litigation: Technical and Legal considerations*, American Association for the Advancement of Science (2018), available online at <https://www.aaas.org/resources/geospatial-evidence-international-human-rights-litigation-technical-and-legal> (which touches on the test for submitting expert evidence, but exclusively focuses on geospatial technologies rather than DOSI more broadly).
- 12 See *infra* Section 5.
- 13 R. Vecellio Segate, 'Cognitive Bias, Privacy Rights, and Digital Evidence in International Criminal Proceedings: Demystifying the Double-Edged AI Revolution', 21 *ICLR* (2021) 242–279, at 266.

through an expert witness.¹⁴ Using the normative framework governing expert evidence will help insulate against the misinterpretation or mishandling of DOSI.¹⁵ It will also help to ensure that the increasingly important process of¹⁶ gathering and presentation of DOSI materials is conducted lawfully and without violating procedural rules or human rights protections, or otherwise harming third parties.¹⁷

The need to examine how DOSI can be submitted via expert evidence is also important for other institutions applying international criminal law. In recent years, documentation efforts by civil society have augmented and the use of digital materials in court proceedings has correspondingly increased.¹⁸ Beyond the ICC, DOSI is used by international organizations such as UN fact-finding missions,¹⁹ human rights organizations, investigative journalists²⁰ and domestic courts in atrocity crimes cases conducted under universal jurisdiction.²¹ Ensuring that the normative framework governing expert evidence can accommodate DOSI is essential for the wider international criminal justice endeavour.²²

- 14 K. Hellwig, 'The Potential and the Challenges of Digital Evidence in International Criminal Proceedings', 22 *ICLR* (2021) 965–988, at 982.
- 15 J. Hendrix, 'Ukraine May Mark a Turning Point in Documenting War Crimes', *Just Security*, 28 March 2022, available online at <https://www.justsecurity.org/80871/ukraine-may-mark-a-turning-point-in-documenting-war-crimes/>; C. Quilling, 'The Future of Digital Evidence Authentication at the International Criminal Court', *Journal of Public and International Affairs*, 20 May 2022, available online at <https://jpia.princeton.edu/news/future-digital-evidence-authentication-international-criminal-court>.
- 16 K. MacLean, 'Interactive Digital Platforms, Human Rights Fact Production, and the International Criminal Court', 15 *Journal of Human Rights Practice (JHRP)* (2023) 84–99, at 85–88.
- 17 See e.g. L. Ten Hulsen, 'Open Sourcing Evidence from the Internet—The Protection of Privacy in Civilian Criminal Investigations Using OSINT (Open-Source Intelligence)', 12 *Amsterdam Law Forum* (2020) 1–45 for a discussion of privacy considerations in using OSINT in criminal investigations.
- 18 D'Alessandra and Sutherland, *supra* note 10.
- 19 *Detailed Findings of the Independent International Fact-finding Mission on the Bolivarian Republic of Venezuela*, UN Doc. A/HRC/45/CRP.11, 15 September 2020.
- 20 See e.g. M. Browne, D. Botti and H. Willis, 'Satellite Images Show Bodies Lay in Bucha For Weeks, Despite Russian Claims', *New York Times*, 4 April 2022, available online at <https://www.nytimes.com/2022/04/04/world/europe/bucha-ukraine-bodies.html>; Y. Al-hlou et al., 'Caught on Camera, Traced by Phone: The Russian Military Unit that Killed Dozens in Bucha', *New York Times*, 22 December 2022, available online at <https://www.nytimes.com/2022/12/22/video/russia-ukraine-bucha-massacre-takeaways.html>.
- 21 See e.g. District Court of The Hague, 'Transcript of the MH17 Judgment Hearing', 17 November 2022, available online at <https://www.courtmh17.com/en/news/2022/transcript-of-the-mh17-judgment-hearing.html> (noting the role of open source photos and video). See also Bellingcat, 'A Post Mortem of Russia's Claim that Crucial MH17 Video Evidence was Falsified', 10 March 2020, available online at <https://www.bellingcat.com/news/2020/03/10/a-post-mortem-of-russias-claim-that-crucial-mh17-video-evidence-was-falsified/>; Freeman, *supra* note 2.
- 22 Whilst expert evidence is particularly relevant for the admission and weighing of DOSI at the ICC, the insights set out in this article are also relevant to other international criminal and civil courts which may encounter DOSI, such as the Kosovo Specialist Chambers; the

2. The Growing Need to Address DOSI in the Context of Expert Evidence

DOSI captures a broad array of materials including video, photos, websites, satellite imagery, drone footage, machine logs, financial transactions and government records.²³ The generation, gathering and verification²⁴ of DOSI involve huge volumes of material and are highly dynamic phenomena.²⁵ Each minute, in excess of 350,000 tweets are posted on Twitter (now 'X'), and over 500 hours of video are uploaded to YouTube.²⁶ Much of this material is contained in formats never tested before international courts. Despite the ground-breaking substantive and procedural advances made by the 1990s *ad hoc* tribunals, they relied far more on analogue evidence than digital evidence.²⁷ Consequently, the ICC must forge its own approach to DOSI with little in the way of authoritative precedent to look to for procedural guidance.

To date, there are very few, if any, instances where the ICC has relied on DOSI for a critical finding.²⁸ Whereas DOSI played a central role in the

Mechanism for the International Criminal Tribunals; and the Extraordinary Chambers of the Courts of Cambodia; as well as domestic courts acting under universal jurisdiction.

- 23 L. Freeman and R. Vazquez Llorente, 'Finding the Signal in the Noise: International Criminal Evidence and Procedure in the Digital Age', 19 *JICJ* (2021) 163–188, at 168.
- 24 Digital verification is a process of using techniques such as geolocation ('the identification or estimation of the location of an object, an activity or the location from which an item was generated') and chronolocation ('the corroboration of the dates and times of the events depicted in a piece of information'); Berkeley Protocol, at 65, as well as and reverse image searching to verify the location, date, and authenticity of the digital material; A. Toler, 'How To Verify and Authenticate user Generated Content', in Dubberley, Koenig and Murray (eds), *supra* note 2, 185–227. A distinction can be made between digital verification and digital forensics, with the latter involving examination and analysis in which the 'methods range from technical, computational tests which analyse the [digital] files themselves for anomalies or unnatural repetitions, to visual inspection of the content depicted in the file, including by separating the frames into stills and searching for so-called "artifacts of manipulation"'; Minogue, Allen and McDermott, *supra* note 2, §§ 87, 91–92; Hellwig, *supra* note 14, at 982. However, the analysis herein takes a global view of DOSI expertise because the ICC's rules of procedure and evidence, particularly those concerning experts, are conceived in a generalized manner, focusing on the form of the evidence (witness statement, document or otherwise) rather than the specific sub-field of expertise relevant to the evidence.
- 25 K.M. Moriarty, 'Why are Authentication and Authorization so Difficult?' Center for Internet Security, 18 October 2021; Hellwig, *supra* note 14, at 982; McDermott, Koenig and Murray, *supra* note 2, at 86. In this vein, the voice authentication expert in *Al-Hassan* was cross-examined as to whether he adhered to his own standard internal procedure and acknowledged that he had to amend the procedures as they were changing the relevant protocol at the time; *Al Hassan* 15 October Trial Transcript, *infra* note 106, at 27–28, 41.
- 26 S. Trevisan, 'Open-Source Information in Criminal Proceedings: Lessons from the International Criminal Court and the Berkeley Protocol', 4 *Giurisprudenza Penale Web* (2021) 1–17, at 1; Freeman (2020), *supra* note 2, at 51.
- 27 Vecellio Segate, *supra* note 13, at 249 citing A. Duffy, 'Bearing Witness to Atrocity Crimes: Photography and International Law', 40 *Human Rights Quarterly* (2018) 776–814, at 803–812.
- 28 The *Al-Mahdi* case is an exception, and even in that case, his conviction was largely based on his guilty plea and accompanying confession: S. Zarmsky, 'Why Seeing Should Not Always Be

Al-Werfalli proceedings, the case did not progress to trial due to his reported death while at large.²⁹ In *Lubanga*, the Trial and Appeals Chambers relied on videos, but they do not appear to have been DOSI in the present sense,³⁰ and their technical aspects were not subject to detailed discussion.³¹ The *Bemba* Trial Chamber's admission and reliance on media recordings of Radio France Internationale *Journal Afrique*³² was overturned by the Appeals Chamber, which described the evidence as 'weak, often consisting of media reports including anonymous hearsay'.³³ In the contempt case of *Bemba et al.*, the Prosecution tendered Facebook photographs to demonstrate the relationship between the parties to the bribery scheme, but the Trial Chamber did not explicitly address the social media posts in its judgment.³⁴

The ICC has had occasion to address DOSI-related issues, including in the context of expert evidence, particularly in the Mali cases. However, in *Al Mahdi*, the expert evidence was not challenged, as the parties stipulated that they would not offer evidence or submissions inconsistent with the plea agreement.³⁵ In *Al Hassan*, a video analysis expert was instructed by the Prosecution to use digital evidence and platforms such as Google Earth to geolocate monuments in the Timbuktu area in Mali, but the judgment had

Believing: Considerations Regarding the Use of Digital Reconstruction Technology in International Law', 19 *JICJ* (2021) 213–225, at 215. Nonetheless, DOSI is increasingly being used in more collateral ways during litigation. For example, in the *Ntaganda* case, a witness's Facebook friendship with another witness was used to cast doubt on the credibility of the witness: Judgment, *Ntaganda* (ICC-01/04-02/06-2359), Trial Chamber VI, 8 July 2019, § 226, fn. 553.

29 D'Alessandra and Sutherland, *supra* note 10; McDermott, Koenig and Murray, *supra* note 2, at 86; Trevisan, *supra* note 26, at 13.

30 See Dissenting opinion of Judge Anita Ušacka, Judgment on the appeal of Mr Thomas Lubanga Dyilo against his conviction, *Lubanga* (ICC-01/04-01/06-3121-Anx2), Appeals Chamber, 1 December 2014, lamenting that the videos are not available for the public to view.

31 See Judgment Pursuant to Art. 74 of the Statute, *Lubanga* (ICC-01/04-01/06-2842), Trial Chamber I, 14 March 2012 ('*Lubanga* Trial Judgment'), § 869 (however, these videos were introduced through witness P-0030, who was not an expert); and Judgment on the appeal of Mr Thomas Lubanga Dyilo against his conviction, *Lubanga* (ICC-01/04-01/06-3121), Appeals Chamber, 1 December 2014 ('*Lubanga* Appeal Judgment'), §§ 200, 223.

32 Decision on the Prosecution's Application for Admission of Materials into Evidence Pursuant to Art. 64(9) of the Rome Statute, *Bemba* (ICC-01/05-01/08-2299), Trial Chamber III, 8 October 2012 ('*Bemba* Admissibility Decision'), § 120. This evidence was not strictly DOSI in the current sense, but analogous considerations were at issue.

33 Judgment on the appeal of Mr Jean-Pierre Bemba Gombo against Trial Chamber III's 'Judgment pursuant to Art. 74 of the Statute', *Bemba* (ICC-01/05-01/08-3636), Appeals Chamber, 8 June 2018 ('*Bemba* Appeal Judgment'), § 183. Compare the *Bemba* Admissibility Decision, *ibid.*, §§ 9, 123, 128 with the *Bemba* Appeal Judgment, *ibid.*, § 183, fns 366–367 referring to fn. 1304 of the trial judgment, which refers to the same video clips (CAR-OTP-0031-0099, CAR-OTP-0031-0099, CAR-OTP-0031-0093, CAR-OTP-0031-0120, CAR-OTP-0031-0124).

34 Trevisan, *supra* note 26, at 2 and 12, citing *Bemba et al.* Trial Judgment, *supra* note 5.

35 Agreement regarding admission of guilt, *Al Mahdi* (ICC-01/12-01/15-78-Anx1-tENG-Red), Office of the Prosecutor & Defence, 25 February 2016, Annex 1, § 14.

not been issued at the date of writing this article.³⁶ Consequently, the Court has not had to grapple with the full extent of litigation challenges that DOSI may present.

It is imperative that the Court adapt its procedures to accommodate the technical challenges which surround DOSI when presented as evidence. Current situations before the Court, such as those in Libya, Ukraine and Palestine, promise to contain significant volumes of DOSI materials. For example, Libyan Marshal Khalifa Haftar, who is reportedly being monitored by the ICC,³⁷ could see DOSI used in a putative case against him for multiple purposes, including to demonstrate the executions committed by his lieutenant now-deceased Mahmoud al-Werfalli,³⁸ to show his own statements reportedly directing that no quarter should be given to prisoners,³⁹ and to prove the existence of armed conflict. If so, experts will inevitably be sought to verify the authenticity and reliability of the DOSI materials, including through the geolocation, chronolocation, reverse-image searching and meta-data analyses discussed herein. In the context of Ukraine, aerial and satellite type DOSI has already been heavily relied on for civil society investigations,⁴⁰ online statements from the Kremlin have been cited by the Independent International Commission of Inquiry on Ukraine,⁴¹ and posts in Telegram channels and other platforms have conveyed inflammatory statements by influential figures,⁴² which could provide a basis to charge incitement to genocide and persecution. Issues of accessibility and fairness arising from the use of such materials have already been raised,⁴³ which will likely lead to the engagement of DOSI specialists as experts. Similarly, the current conflict between Hamas

36 See Forensic Video Analysis Report HAK, *Al Hassan* (MLI-OTP-0069-9281), Office of the Prosecutor, 31 March 2020 ('Amy Hak Forensics Report'), at 80–81. Several other expert witnesses were called during this case, some of whose evidence concerned DOSI matters. See also Trevisan, *supra* note 26, at 10–11.

37 See M. Perelman, 'ICC Chief Prosecutor Sends Warning to Libyan Strongman Haftar', *France 24*, 16 December 2019, available online at <https://www.france24.com/en/africa/20191216-exclusive-interview-icc-chief-prosecutor-sends-warning-libyan-strongman-haftar-ivory-coast-palestine-afghanistan-myanmar-philippines>.

38 See Warrant of Arrest, *Al-Werfalli* (ICC-01/11-01/17), 15 August 2017, §§ 11–22; Second Warrant of Arrest, *Al-Werfalli* (ICC-01/11-01/17), 4 July 2018, §§ 17–18; J. Dettmer, 'Video Emerges of IS-style Mass Killing of Jihadists in Libya', *Voice of America*, 24 July 2017 available online at <https://www.voanews.com/a/video-islamic-state-style-mass-killing-jihadists-libya/3957079.html>.

39 'Footage surfaces showing Libya's Haftar 'ordering war crimes'', *The New Arab*, 20 September 2017, available online at <https://www.newarab.com/news/footage-surfaces-showing-libyas-haftar-ordering-war-crimes>.

40 See e.g. Al-hlou et al., *supra* note 20.

41 See e.g. *Report of the Independent International Commission of Inquiry on Ukraine*, A/78/540, 19 October 2023, § 12.

42 See e.g. G. Jones, 'Russian TV Presenter Says Sorry but Faces Probe for Call to Drown Ukrainian Children', 24 October 2022 available online at <https://www.reuters.com/world/europe/russian-tv-presenter-says-sorry-faces-probe-call-drown-ukrainian-children-2022-10-24/>.

43 See e.g. S. Zarnsky and J. Mionki, 'Symposium on Fairness, Equality, and Diversity in Open Source Investigations', *Opinio Juris*, 10 February 2023 available online at <https://opiniojuris.org>.

and Israel has seen a torrent of DOSI materials being disseminated, including footage of the 7 October 2023 attack on the Nova music festival, interviews with detained Hamas attackers and missile and rocket strikes by both parties. Any cases that emerge from these clashes will involve a large proportion of DOSI type materials, which in many cases will have been widely viewed, shared, and in some cases altered online, again necessitating the involvement of DOSI experts to analyse and verify their contents and provenance. Procedural battles over the parameters of expert testimony, including who can qualify as an expert, will arise in connection with any ensuing legal proceedings.

The six-factor framework proposed in this article for determining DOSI experts⁴⁴ can assist in those situations and others featuring heavy DOSI components. Whereas formal adoption of this framework is a matter for the Assembly of States Parties or the Court (depending which instrument they are introduced into),⁴⁵ the criteria can nonetheless be used by chambers and by organizations as a guide in their current work on cases potentially emerging from these situations, particularly regarding specialized work to gather, analyse and verify DOSI materials.

Under the court's current procedures, the lack of an established normative framework specifically governing the admission of DOSI is concerning. The potential misuse of DOSI continues to grow in magnitude and sophistication. Modern technology can already produce fakes that are indistinguishable from real footage to the naked eye.⁴⁶ In 2022, a deepfake video of Ukrainian President Volodymyr Zelensky calling his troops to surrender to Russian forces was circulated on social media.⁴⁷ Other images published by international media purported to show Buddhist monks burning Rohingya victims, but actually depicted the cremation of victims of China's 2010 earthquake.⁴⁸ The risks of misplaced reliance on DOSI can be exacerbated when the technology is new and visually impressive, such as digital reconstruction technology.⁴⁹

org/2023/02/10/symposium-on-fairness-equality-and-diversity-in-open-source-investigations-out-in-the-open-fair-trial-rights-and-open-source-evidence-at-the-icc/.

44 See *infra* Section 5.

45 The adoption of amendments to the Rules of Procedure and Evidence requires a 2/3 majority of State Parties (Art. 51(2)). Judges can also adopt provisions by a 2/3 majority on a provisional basis (Art. 51(3)); see K. Sharma, 'The Curious Case of Rule 165 of the Rules of Procedure and Evidence: The Effect of Control Exercised by the Assembly of States Parties over the International Criminal Court', 20 *ICLR* (2020) 285. Judges can amend Regulations of the Court by absolute majority and can also amend the Chambers Practice Manual (currently, 6th edn., 2022), but the Manual is only instructive and not mandatory.

46 See Minogue, Allen and McDermott, *supra* note 2, § 90; Freeman (2020), *supra* note 2, at 65.

47 B. Allyn, 'Deepfake Video of Zelensky could be 'tip of the iceberg' in Info War, Experts Warn', National Public Radio, 16 March 2022, available online at <https://www.npr.org/2022/03/16/1087062648/deepfake-video-zelenskyy-experts-war-manipulation-ukraine-russia?t=1660657155956>.

48 D'Alessandra and Sutherland, *supra* note 10, at 24.

49 See e.g. Zarnsky, *supra* note 28, at 214. This is not to say that digital reconstruction evidence is inherently inadmissible. See also Vecellio Segate, *supra* note 13, at 255 (referring to the seductive quality of video evidence).

Detecting fake or manipulated DOSI materials will increasingly require specialized analysis.⁵⁰ This includes comprehensive metadata checks, and reverse image searches, as well as more sophisticated tools and techniques.⁵¹ Analyses of DOSI material are best conducted by persons with specialized skills and knowledge in this domain, who can testify in relation to its provenance, reliability and authenticity.⁵² Those persons would usually be led as expert witnesses, particularly if they did not originally discover the DOSI materials themselves but instead were involved in verifying and interpreting it. In this light, it is apposite to examine whether the ICC's procedural framework governing expert evidence is suitable for application to DOSI.

3. The ICC's Minimalist Procedural Framework Concerning Expert Evidence and DOSI

A. ICC Normative Prescriptions of Particular Importance to Expert Evidence

In keeping with the historical precedents of 'relaxed' evidentiary regimes in war crimes proceedings,⁵³ the ICC's procedural framework is flexible and open.⁵⁴ This minimalist and flexible approach is particularly notable with respect to expert evidence, which contrasts with the more detailed prescriptions on expert evidence applied in some domestic systems.⁵⁵

The gateway question is who can qualify as an expert witness.⁵⁶ In *Ntaganda*, the Court relied on ICTY jurisprudence in describing an expert as 'a person who, by virtue of some specialized knowledge, skill or training can

50 Already, personnel with video and image verification skills are in demand at accountability mechanisms in Geneva; see D. Murray, Y. McDermott, and A. Koenig, 'Mapping the Use of Open-Source Research in UN Human Rights Investigations', 14 *JHRP* (2022) 554–581.

51 D'Alessandra and Sutherland, *supra* note 10, at 24.

52 See below, Section 4 for discussions of audio and video verification experts in *Al Hassan*. There are other ways to have DOSI admitted, including through the authenticating testimony of witnesses with personal knowledge that the evidence is what it purports to be; P.W. Grimm, D.J. Capra and G.P. Joseph, 'Authenticating Digital Evidence', 69 *Baylor Law Review* (2017) 1–55.

53 Vecellio Segate, *supra* note 13, at 243.

54 R. Gallmetzer, 'The Trial Chamber's Discretionary Power to Devise the Proceedings Before it and its Exercise in the Trial of Thomas Lubanga Dyilo', in C. Stahn and G. Sluiter (eds), *The Emerging Practice of the International Criminal Court* (Brill, 2009) 501–524, at 507; MacLean, *supra* note 16, at 85; Freeman, *supra* note 2, at 50; Appazov, *supra* note 5, at 3. See also Corrigendum to Decision on the admissibility of four documents, *Lubanga* (ICC-01/04-01/06-1399-Corr), Trial Chamber I, 21 January 2011, § 26.

55 See *infra* Section 5 (on domestic approaches to expert evidence).

56 See A. Singh, 'Expert Evidence', in K.A.A. Khan, C. Buisman and C. Gosnell (eds), *Principles of Evidence in International Criminal Justice* (Oxford University Press, 2010) 599–649, at 611 referring to Oral Decision on Qualification of Prosecution Expert Sebahire Deo Mbonyikebe, *Bizimungu et al.* (ICTR-99-50-T), Trial Chamber II, 2 May 2005 ('*Bizimungu* Expert Qualification Decision'); Appeals Judgment, *Simba* (ICTR-01-76-A), Appeals Chamber, 27 November 2007, § 174; Oral Decision on the Qualification of Mr Edmond Babin as Defence Expert Witness, *Ndayambaje et al.* (ICTR-98-42-T), Trial Chamber II, 13 April 2005, § 5.

assist the Chamber in understanding or determining an issue of a technical nature that is in dispute'.⁵⁷ Whether or not a person will be considered to have sufficient expertise on a particular matter depends on the person's education, experience in the relevant field, publications and additional background relating to the subject on which they would testify.⁵⁸ Despite this broad framing, the range of persons recognized as experts at the ICC and other international institutions has typically focused on traditional categories of scientific assessment. The ICC's List of Experts application form refers to the following categories of expertise: ballistics; finance (financial investigations/freezing assets); forensic medicine; graphology; psychology; and reparations, as well as situation-specific expertise on history; judicial systems; military science; policing; politics and geopolitics; and linguistics.⁵⁹ There is no overt mention of DOSI or one of its sub-categories.⁶⁰ Whilst persons in non-enumerated fields, such as DOSI, may apply to be included on the List of Experts, they 'must explain how their expertise is relevant to ICC proceedings'.⁶¹

The jurisprudence of international courts has established parameters for the delivery of expert evidence. Fundamentally, expert witnesses are permitted to provide their opinions on matters exceeding their direct sensory experience.⁶² They can comment on evidence, addressing factors beyond those immediately apparent on its face (apparent features can be conveyed by lay 'summary' witnesses).⁶³ Importantly, the expert's evidence should lie outside of the typical lay person's knowledge.⁶⁴ This justifies the expert being able to provide their opinions as evidence and reflects the 'special epistemic nature' of expert witnesses in litigation.⁶⁵ In light of this special role, ICC jurisprudence has established that experts must provide their evidence with the 'utmost neutrality and objectivity'.⁶⁶

57 Decision on Defence Preliminary Challenges to Prosecution's Expert Witnesses, *Ntaganda* (ICC-01/04-02/06-1159), Trial Chamber VI, 9 February 2016, § 7 citing *inter alia* Decision on Joint Defence Interlocutory Appeal concerning the Status of Richard Butler as an Expert Witness, *Popović et al.* (IT-05-88-AR73.2), Appeals Chamber, 30 January 2008 ('*Popović Butler Appeal Decision*'), § 27.

58 Singh, *supra* note 56, at 614–615.

59 See ICC, 'Experts', available online at <https://www.icc-cpi.int/get-involved/experts>.

60 See *infra* Section 2.

61 See ICC, 'Experts', *supra* note 59.

62 *Bemba et al.* Trial Judgment, *supra* note 5, § 20. D. Dwyer, *The Judicial Assessment of Expert Evidence* (Cambridge University Press, 2008), at 78; Richmond and Sebastiano, *supra* note 5, at 1017.

63 See e.g. Transcript, *Bemba et al.* (ICC-01/05-01/13-T-11-Red-ENG), Trial Chamber VII, 30 September 2015, at 6. See also Appazov, *supra* note 5, at 19 (experts can explain 'why certain facts should yield certain inferences').

64 Appeal Judgment, *Semanza* (ICTR-97-20-A), Appeals Chamber, 20 May 2005 ('*Semanza Appeal Judgment*'), § 303.

65 Dwyer, *supra* note 62, at 2; and C.M. Milroy, 'A Brief History of the Expert Witness', 7 *Academic Forensic Pathology* (2017) 516–526.

66 Decision on Defence Preliminary Challenges to Prosecution's Expert Witnesses, *Ntaganda* (ICC-01/04-02/06-1159), Trial Chamber VI, 9 February 2016, § 9. See also Trial Judgment, *Ongwen* (ICC-02/04-01/15), Trial Chamber IX, 4 February 2021, § 2531.

Substantively, a specialist's expertise must cover the subject-matter of the evidence to be adduced.⁶⁷ Moreover, in theory, experts should not opine on ultimate issues of fact or law which are contested and fall into the province of the Chamber to determine.⁶⁸ Expert evidence which would usurp the functions of the Chamber include, for example, opinions as to an accused's guilt or innocence, or whether the contextual, material or mental elements of the crimes charged are satisfied.⁶⁹ At the International Criminal Tribunal for Rwanda (ICTR), this prohibition resulted in the exclusion of Dr Bernard Lugan's views on the 'planning of genocide, the legitimacy of civil defence, and evidence regarding the conduct of the accused'.⁷⁰ However, the rule is subject to a range of interpretations. In other instances, experts have been allowed to testify on matters essentially amounting to elements of offences.⁷¹

Procedurally, experts typically provide a report, setting out their methodology and findings, which is disclosed to the other party well in advance of the expert testifying. The content of the report and proposed testimony must fall within the witness's expertise and the evidence must potentially be of assistance to the Chamber.⁷² ICC judges can *proprio motu* order experts to provide a report and to testify before them.⁷³ They can also order jointly commissioned expert reports⁷⁴ and can order experts to testify at the same time⁷⁵ In this

67 Singh, *supra* note 56, at 615–616.

68 See e.g. Decision on Prosecution Request to Exclude Defence Witness D-22-0004, *Bemba et al.* (ICC-01/05-01/13-1653), Trial Chamber VII, 24 February 2016 ('*Bemba et al.* Witness Exclusion Decision'), § 18; Decision on Prosecution Motion for Reconsideration of the Decision on Prospective Experts Guichaoua, Nowrojee and Des Forges, or for Certification, *Karemera et al.* (ICTR-98-44-T), Trial Chamber III, 16 November 2007, § 21; Decision on Report of Prosecution Expert Klaus Reinhardt, *Hadžihasanović and Kubura* (IT-01-47-T), Trial Chamber II, 11 February 2004, at 4. See also M. Gillett, *Prosecuting Environmental Harm before the International Criminal Court* (Cambridge University Press, 2022), at 197–198; Singh, *supra* note 56, at 601.

69 Decision on Sang Defence Application to exclude Expert Report of Mr Hervé Maupeu, *Ruto and Sang* (ICC-01/09-01/11-844), Trial Chamber V(a), 7 August 2013, § 13.

70 Singh, *supra* note 56, at 618, citing Order Relating to Defence Witness Bernard Lugan, *Karemera et al.* (ICTR-98-44-T), Trial Chamber III, 5 May 2008, § 7.

71 For example, in *Nahimana*, which centered on the responsibility of the figureheads of a private Rwandan radio station for inciting genocide, the ICTR accepted expert evidence that there were 'widespread attacks against the Tutsi population across Rwanda' and that 'RTLM [the radio station] had an enormous impact on the situation, encouraging the killings of Tutsis and of those who protected Tutsis'. Singh, *supra* note 56, at 618 citing Decision on the Expert Witnesses for the Defence, *Nahimana et al.* (ICTR-99-52-A), Trial Chamber I, 24 January 2003 and Trial Judgment, *Nahimana et al.* (ICTR-99-52-T), Trial Chamber I, 3 December 2003, § 458.

72 *Bemba et al.* Witness Exclusion Decision, *supra* note 68, § 11.

73 *Lubanga* Trial Judgment, *supra* note 31, § 11 (however, the Prosecution did not call expert evidence in relation to the critical issue at trial, the age of the children shown in videos in Lubanga's entourage, see *Lubanga* Appeals Judgment, §§ 187–188); Judgment pursuant to Art. 74 of the Statute, *Katanga* (ICC-01/04-01/07-3436-tENG), Trial Chamber II, 7 March 2014, § 21.

74 Regulation 44(2) of the ICC's Court Regulations.

75 See e.g. First Instance Verdict, *Prosecutor's Office of Bosnia and Herzegovina v. Novak ukić* (CtBiH-X-KR-07/394), Court of Bosnia and Herzegovina, 12 June 2009, §§ 319–325; P. Murphy and

way, Chambers can control the mode of expert instruction, the manner in which their evidence is to be presented and the time limits for the preparation and notification of their reports.⁷⁶ While the ICC approach was intended to expand the judicial role in the instruction of experts,⁷⁷ in practice the parties have instructed experts in many of the cases heard to date as discussed herein.

B. The Treatment of DOSI Under the ICC's Normative Framework

Although there is little direct prescriptive regulation of DOSI in the ICC's framework, its jurisprudence has set out broad guidance of potentially relevance, such as requiring parties to indicate the date and location from which open source materials were obtained.⁷⁸ There is also judicial and academic support for DOSI being verified for its provenance, meta-data, potential tampering,⁷⁹ misattribution and authorship⁸⁰ and authenticity.⁸¹ Establishing those (counter-)indicia of reliability will also be important for the submission/admission and weight of DOSI.

DOSI will frequently contain hearsay. The ICC has expressed considerable reluctance to admit open source materials based on anonymous hearsay,⁸² such as from NGOs, the United Nations and media sources.⁸³ The scepticism reflects concerns about the conditions in which hearsay is typically received — with no oath, no ability to cross-examine on issues of recollection, perception, sincerity and meaning, along with no ability to observe the statement maker's demeanour.⁸⁴ Relatedly, the best evidence rule, which has been

L. Baddour, 'International Criminal Law and Common Law Rules of Evidence', in Khan, Buisman and Gosnell (eds), *supra* note 56, 96, at 110–111. Hearing multiple experts simultaneously has been termed colloquially as 'hot-tubbing'; Decision on Simultaneous or Concurrent Testimony of Expert Witnesses, *Ayyash et al.* (STL-11-01/T/TC), Trial Chamber, 17 February 2015, §§ 12–39.

76 Singh, *supra* note 56, at 606.

77 See Singh, *supra* note 56, at 599, 606.

78 Decision on the Prosecutor's Bar Table Motions, *Katanga and Ndudjolo* (ICC-01/04-01/07), Trial Chamber II, 17 December 2010 ('*Katanga and Ndudjolo* Bar Table Motions'), § 24(a) and (d).

79 See Trevisan, *supra* note 26, at 4.

80 See N. Mehandru and A. Koenig, 'ICTs, Social Media, & the Future of Human Rights', 17 *Duke Law and Technology Review* (2019) 129–145, at 135.

81 See also *Bemba et al.* Trial Judgment, *supra* note 5, § 247.

82 Decision adjourning the hearing on the confirmation of charges pursuant to Art. 61(7)(c)(i) of the Rome Statute, *Gbagbo* (ICC-02/11-01/11-432), Pre-Trial Chamber I, 3 June 2013 ('*Gbagbo* Confirmation Adjournment'), §§ 28–35.

83 Freeman (2020), *supra* note 2, at 50, citing Decision on the admission into evidence of items deferred in the Chamber's 'Decision on the Prosecution's Application for Admission of Materials into Evidence Pursuant to Article 64(9) of the Rome Statute', *Bemba* (ICC-01/05-01/08-2721), Trial Chamber III, 27 June 2013.

84 See D. Sorvatzoti, 'Free Evaluation of Evidence: Does the ICC need a Law of Evidence?', 22 *ICLR* (2021) 895–919, at 905.

applied by international tribunals,⁸⁵ provides that ‘the Trial Chamber will rely on the best evidence available in the circumstances’.⁸⁶ For DOSI, where there are frequently multiple copies of an item or post, sometimes amplified with adjustments and extraneous material added, the Court will be assisted in its deliberations if parties seek to submit the most authoritative ‘original’ version of the evidence.

Other than those broad and non-DOSI specific forms of guidance, to date, the ICC has not adopted any specific legal rules (in the formal sense under Article 21) regarding the collection, preservation, admissibility and verification of DOSI.⁸⁷ In the absence of any detailed legal regulation of DOSI, expert evidence will be particularly important for its authentication and interpretation.

An important underlying question concerns the taxonomical categorization of DOSI. Some commentators classify DOSI as documentary evidence,⁸⁸ others as real evidence⁸⁹ or even as a mix of the two.⁹⁰ At the same time expert views on DOSI may be seen as testimonial evidence.⁹¹ This disparate terminology highlights the need for conceptual clarity regarding DOSI.

Typical DOSI, such as videos or photos, involve editorial choices, at minimum in the sense of determining where to point the camera and when to

85 See R. Glover, *Murphy on Evidence* (15th edn., Oxford University Press, 2017), Section 2.5.1.

86 Decision on the Admission into Evidence of Intercept Related Materials, *Blagojević and Jokić* (IT-02-60-T), Trial Chamber I, 18 December 2003, § 25; Decision Adopting Guidelines on the Standards Governing the Admission of Evidence, *Martić* (IT-95-11-T), Trial Chamber I, 19 January 2006, § 7.

87 See *supra* note 45 concerning the amendment options for the Court’s various instruments. Among civil society actors, various organizations have worked on guidelines, such as the Berkeley Protocol and the current Nuremberg Principles Academy project on digital evidence, but none have been officially adopted by the ICC as Art. 21 type sources of law. See also Vecellio Segate, *supra* note 13, at 249.

88 See e.g. Hellwig, *supra* note 14, footnote 131; Freeman (2020), *supra* note 2, at 64; Vecellio Segate, *supra* note 13, at 249. Documentary evidence is information recorded on any media which is tendered to prove a fact based on that information (typically meaning that it is tendered to prove the truth of its contents); Glover, *supra* note 85, Section 2.5.1; M. Nerenberg and W. Timmermann, ‘Documentary Evidence’, in Khan, Buisman and Gosnell (eds), *supra* note 56, 443–498.

89 E.g., S. Aalto-Setälä et al., *supra* note 78, Section A5 citing *Katanga and Ngudjolo* Bar Table Motions, *supra* note 78, § 24 (stating that a video will be admitted as ‘real’ evidence). Real evidence consists of tangible objects which can be brought into the courtroom (subject to logistics) to show their condition and from which ‘the tribunal of fact can draw conclusions from its own perception’; Glover, *supra* note 86, Section 2.5.1.

90 In the simulated *voir dire* hearing ran by the Global Legal Action Network (GLAN), Bellingcat, and the *OSR4Rights* project at Swansea University, DOSI video material (called OAVC in that exercise) was described in several ways including: real evidence; documentary evidence; and documentary evidence containing real evidence; Minogue, Allen and McDermott, *supra* note 2, §§ 49, 57.

91 In relation to expert evidence as testimonial evidence, see Decision on the Prosecution’s Applications for Introduction of Prior Recorded Testimony under Rule 68(2)(b) of the Rules, *Ongwen* (ICC-02/04-01/15-596-Red), Trial Chamber IX, 18 November 2016, § 9 (holding that a chamber may permit expert reports to be introduced via rule 68 — such as rule 68(3)).

start and end the images or video that are shown.⁹² Whilst such items could be introduced as either documentary evidence or real evidence, the former is more likely than the latter, as they will be tendered to prove the veracity of their contents rather than simply their existence and physical features.⁹³

The evidentiary categorization of DOSI is particularly important when it comes to the *purpose* of expert evidence. If the images or video are real evidence, which ‘speak for themselves’,⁹⁴ then the expert’s role (if any) would logically be restricted to questions of verification and authenticity. However, if the DOSI is documentary evidence, then expert testimony will be required to explain and interpret the evidence, including its contents, for the fact-finders. This is inherently a case-by-case analysis. But it is clear that the more forensically relevant the DOSI contents, the more likely the parties will contest the veracity of the contents or the way in which they have been edited. Resolving these issues will involve technical tests, such as ‘geolocation, chronolocation, checks for internal consistency within a video and source analysis, checks for consistency across multiple items purporting to depict the same event, and other, ad-hoc, methods’.⁹⁵ These would likely exceed the normal bounds of lay persons’ experience.⁹⁶ In this way, tendering DOSI will often require the accompanying expert opinion, as ‘matters of personal opinion or expertise beyond the remit of a factual witness must be excluded’.⁹⁷

The preceding survey shows that the ICC’s rules and jurisprudence sit uneasily with DOSI materials in litigation, revealing gaps and inconsistencies even at the taxonomical level, which will only grow as the potential for manipulation of digital materials increases. Addressing the challenges posed by DOSI to the ICC’s regime governing expert evidence is imperative in light of the wide accessibility and growing prevalence of digital materials in international crimes litigation.⁹⁸

92 Vecellio Segate, *supra* note 13, at 255–256.

93 See e.g. *R v. Lydon* (1987) 85 Cr App R 221 (where a gun and two scraps of paper (saying ‘Sean rules’) were found along the road verge passed by a car with which the prosecution sought to link the defendant (Sean Lydon); they were deemed admissible evidence to corroborate a disputed identification connecting the defendant to the car and thereby to a robbery, rather than to prove that Sean in fact ‘rules’).

94 *Katanga and Ngudjolo* Bar Table Motions, *supra* note 78, § 24(a) and (d).

95 Minogue, Allen and McDermott, *supra* note 2, § 67.

96 For example, in an ECtHR case, a DOSI specialist from the Bellingcat organization had to explain why two visually conflicting versions of an image existed online, which is not something a typical lay person would know. See E. Higgins, ‘How Open Source Evidence was Upheld in a Human Rights Court’, *Bellingcat*, 28 March 2023, available online at <https://www.bellingcat.com/resources/2023/03/28/how-open-source-evidence-was-upheld-in-a-human-rights-court/referring-to-Ukraine-and-The-Netherlands-v.-Russia>, ECtHR (applications nos. 8019/16, 43800/14 and 28525/20).

97 Singh, *supra* note 56, at 623–624. See also Richmond and Sebastiano, *supra* note 5, at 1017.

98 D’Alessandra and Sutherland, *supra* note 10; W.H. Wiley, ‘International(ised) Criminal Justice at a Crossroads: The Role of Civil Society in the Investigation of Core International Crimes and the CIJA Model’, in Bergsmo and Stahn (eds), *supra* note 9, 547–587, at 547.

4. Challenges to the Established Paradigm Governing Expert Evidence

A. DOSI Tests the Binary Between Experts and Lay Witnesses

The accessibility and democratizing nature of DOSI presents challenges to the existing binary between expert and lay witness.⁹⁹ In relation to a novel form of expertise (acoustic analysis), Lord Justice Bingham observed in the English case of *R v. Robb*:

the risk that if, in a criminal case, the Crown are permitted to call an expert witness of some but tenuous qualifications the burden of proof may imperceptibly shift and a burden be cast on the defendant to rebut a case which should never have been before the jury at all ... a defendant cannot fairly be asked to meet evidence of opinion given by a quack, a charlatan or an enthusiastic amateur ...¹⁰⁰

Lord Bingham's reference to enthusiastic amateurs has particular resonance for DOSI-based evidence. Easy access to the tools and underlying material mean that no qualification is required to begin conducting DOSI investigations. Leading DOSI specialist Eliot Higgins has argued that 'OSI analysis can be performed by anyone — it is easy to learn how to do'.¹⁰¹ He himself is a 'self-taught college dropout'.¹⁰² Consequently, participants range from renowned experts to undergraduate students with no prior experience or particular technical expertise.¹⁰³ In this respect, the inclusive and democratizing characteristics of DOSI fit awkwardly with expert status, which has traditionally been based on a level of specialized skill or knowledge, beyond the usual remit of a lay person or judge.¹⁰⁴ As a growing proportion of society becomes digitally literate and computer savvy, it will be increasingly difficult to maintain that basic forms of digital verification constitute a specialized form of knowledge exceeding the normal capabilities of fact-finders.¹⁰⁵

In determining which type of specialized knowledge will be accepted as expert evidence for DOSI materials, it is instructive to review examples of specialists on audio-visual type materials who have been recognized as experts before the ICC. These experts typically utilized an array of technical analyses

⁹⁹ See Minogue, Allen and McDermott, *supra* note 2, § 76.

¹⁰⁰ Bingham LJ in *R v. Robb* [1991] 93 Cr App R 161, § 166. See also Judge Korner's ruling as summarised in Minogue, Allen and McDermott, *supra* note 2, § 76–77.

¹⁰¹ See Minogue, Allen and McDermott, *supra* note 2, § 67.

¹⁰² M. Roache, 'Bellingcat Has Revealed War Crimes in Syria and Unmasked Russian Assassins. Founder Eliot Higgins Says They're Just Getting Started', *TIME*, 2 March 2021, available online at <https://time.com/5943393/bellingcat-eliot-higgins-interview>.

¹⁰³ See e.g. S. Dubberley, 'The Digital Verification Corps: Amnesty International's Volunteers for the Age of Social Media', Amnesty International Citizen Evidence Lab, 6 December 2019, available online at <https://citizenevidence.org/2019/12/06/the-digital-verification-corps-amnesty-internationals-volunteers-for-the-age-of-social-media/>

¹⁰⁴ See *Semanza* Appeal Judgment, *supra* note 64, § 303; Decision on the Motion by the Prosecution to Allow the Investigators to Follow the Trial during the Testimonies of the Witnesses, *Delalić et al.* (IT-96-21-T), Trial Chamber, 20 March 1997, § 10.

¹⁰⁵ See *infra* note 130 for a relevant example relating to Bellingcat.

with a statistical backing to their findings and/or had certification or membership of widely recognized industry bodies.

For example, in the ICC case of *Al Hassan*, a voice authentication expert compared items under examination (purportedly containing clips of the accused speaking) against reference items from his appearances in court.¹⁰⁶ Whereas experts' CVs are usually provided,¹⁰⁷ this expert's CV was not disclosed publicly. But he testified that he had 10 years of experience in the area and attended expert group sessions of the European Network of Forensic Science Institutes on voice recognition.¹⁰⁸ He noted that his analyses incorporate highly technical software, including automatic voice comparison using an algorithm-based system, which accounted for the acoustic context and inter-variability between moments of speaking, and generated likelihood ratios of a match between the items under examination and the reference items.¹⁰⁹ Given its ostensibly scientific and statistically grounded nature, this type of assessment is analogous to traditional expert evidence, such as DNA match analysis.

Another example of specialized skills considered sufficient to qualify as an expert is those of ICC Forensic Officer Amy Hak, who was called as an expert on forensic video analysis in *Al-Hassan*.¹¹⁰ In addition to setting out her professional roles related to video analysis, her CV included reference to her previous experience of being an expert witness in multiple jurisdictions, such as Canada, details of the numerous trainings she had undertaken and her certification as a forensic video analyst.¹¹¹

Aside from the high degree of technical skill involving in these experts' assessments, their certification and/or membership of professional bodies indicates that possession of industry qualifications will increase the likelihood of being recognized as an expert. This is also conveyed by the Court's expert application form, which asks whether the applicant is registered with a professional body in their home jurisdiction and carries professional insurance.¹¹²

In this respect, it is notable that there is no overarching qualification or certification in DOSI that has formal recognition at the national or international level on a par with status as a medical doctor or forensic pathologist, for example.¹¹³ Some leading international justice related organizations offer

106 See Transcript, *Al Hassan* (ICC-01/12-01/18-T-036-Red-ENG), Trial Chamber X, 15 October 2020 ('*Al Hassan* 15 October Trial Transcript'), at 6. Because of redactions and restrictions on the information available, it is unclear whether the items under examination were DOSI or were obtained from non-open sources.

107 See e.g. Joint Prosecution and Defence Submission of the Expert Report, *Abd-Al-Rahman* (ICC-02/05-01/20-582), 4 February 2022, § 9.

108 *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 25, 65.

109 *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 9.

110 She attached her CV to her expert report; see Amy Hak Forensics Report, *supra* note 36.

111 Amy Hak Forensics Report, *supra* note 36, at 67–75.

112 See ICC, 'Application Form: Natural Persons', available online at https://www.icc-cpi.int/sites/default/files/ICC_Experts_Form_Eng.docx, at 5.

113 MacLean, *supra* note 16, at 85–88; N. Hughes, U. Karabiyik, 'Towards Reliable Digital Forensics Investigations Through Measurement Science', 2 *WIRES Forensic Science* (2020) 1367–1377, at 1367.

professional training in DOSI,¹¹⁴ and more academic courses have been developed in this field in recent years.¹¹⁵ Many private entities offer certification in DOSI in the context of cybersecurity.¹¹⁶ However, those courses have not received the formal recognition from State structures equivalent established regulatory bodies such as national bar councils for lawyers or medical boards for doctors. The lack of formal qualification system overarching DOSI will make it difficult for judges to determine who can be considered an expert witness regarding DOSI.

In lieu of a system of formal qualifications, one option is to lower the threshold of expertise required and eschew any insistence on certification. This could see DOSI investigators and enthusiasts liberally accepted as experts. In some domestic jurisdictions, the scope of acceptable expert evidence has been extended to encompass areas beyond established scientific disciplines, including ‘fingerprints, handwriting and accident reconstruction ... the market value of land, ships, pictures or rights ... the quality of commodities, or on the literary, artistic, scientific or other merit of works alleged to be obscene’.¹¹⁷ Allowing DOSI specialists into the expert club would follow in the same evolutionary spirit.

However, broadening the parameters may lower the quality of the analyses and may exacerbate claims of selectivity in determining who is an expert. Questions of subjectivity have previously been raised, with the process described as ‘essentially a subjective one, with normative judgements being formed on the basis of an expert’s education, experience, and other pedigrees, and often, the quantum of his or her white hair’.¹¹⁸ For example, before the ICTR, ‘proposed expert witness Jean Rubaduka was not qualified as an expert in Rwandan constitutional law, although he was a member of the Rwandan constitutional court and conseil d’etat, and had taught law at the National University of Rwanda’.¹¹⁹ Further, ‘[a]n academic teaching on Rwanda at the School of African and Oriental Studies (SOAS), London, was not qualified as

114 See e.g. Human Rights Center, UC Berkeley School of Law and the Institute of International Criminal Investigations, ‘Course: Open Source Investigation–Foundational’, available online at <https://iici.global/course/open-source-investigation-foundational>; Bellingcat, ‘Workshops’, available online at <https://www.bellingcat.com/workshops>; Amnesty International, ‘Open source investigations for human rights: Part 1’, Advocacy Assembly, available online at <https://advocacyassembly.org/en/courses/57>; Atlantic Council, ‘360/Digital Sherlocks’, available online at <https://www.digitalsherlocks.org>.

115 See e.g. Centre of Governance & Human Rights, ‘Open Source Investigation for Academics’, University of Cambridge, available online at <https://www.cghr.polis.cam.ac.uk/projects/open-source-investigation-academics>; UCLA School of Law, ‘Human Rights and War Crimes Digital Investigations’, available online at <https://law.ucla.edu/academics/curriculum/human-rights-and-war-crimes-digital-investigations>.

116 See e.g. IntelTechniques, ‘Video Training + Certification’, available online at <https://www.inteltechniques.net/bundles/video-training-certification>; Global Information Assurance Certification, ‘GIAC Open Source Intelligence Certification (GOSI)’, available online at <https://www.giac.org/certifications/open-source-intelligence-gosi>

117 Minogue, Allen and McDermott, *supra* note 2, § 76.

118 Singh, *supra* note 56, at 614.

119 *Ibid.*, citing the *Bizimungu* Expert Qualification Decision, *supra* note 56.

an expert' on the basis that 'he lacked a PhD in the subject, he was working part-time as an optometrist, and had never conducted field research in Rwanda, and the journals in which he had been published lacked pedigree'.¹²⁰ At the same time, other chambers have qualified persons as experts simply based on their deep knowledge of the subject, without the types of formal qualifications traditionally sought for this categorization.¹²¹

To avoid fuelling arguments about disparate treatment and biased selectivity, it will be important for the Court to establish objectively justifiable criteria for its qualification of experts. The move to objective criteria reflects a broader underlying shift away from expert status being accorded to a small number of typically privileged individuals based on relatively opaque assessments, towards a more accessible set of criteria which may be met by any person who can demonstrate sufficiently specialized skills and/or knowledge. Objective criteria also help avoid any 'adverse distinction founded on grounds such as gender, age, race, colour, language, religion or belief, political or other opinion, national, ethnic or social origin, wealth, birth or other status'.¹²² To these ends, six criteria that could be used to discern DOSI experts are set out further below.¹²³

B. DOSI as a Group-based Form of Information Gathering

The expert witness is often envisioned as an enlightened individual on the stand educating the judges or jury about a complex technical issue that the expert has years of experience working on.¹²⁴ The language of ICC jurisprudence demonstrates this stereotype,¹²⁵ referring to 'a single, impartial and suitably qualified expert'.¹²⁶ Even the ICC's application form for organizations to be listed as experts, which theoretically permits group-based expert activity to be recognized before the Court, explicitly requests the 'name of the person designated to represent the expert organization'.¹²⁷

120 Singh, *supra* note 56, at 614–615 citing Public Transcript of Hearing, *Bizimungu et al.* (ICTR-99-50-T), Trial Chamber II, 25 April 2006, at 3–4.

121 Singh, *supra* note 56, at 615 referring to the ICTR Trial Chamber's qualification in *Nahimana et al.* of a prosecution expert, Kabanda, on print media, on the basis that 'out of a list of 51 publications, newspaper publication journals that were put to him, he was familiar or aware of 43 of those'. See also Decision on Expert Witness PRH348, Mr Geyer, *Ayyash et al.* (STL-11-01/T/TC), Trial Chamber, 16 July 2014.

122 Art. 21(3) ICCSt.

123 See *infra*, Section 5.

124 See e.g. ICTY cases referred to above, in which the majority of the admitted experts prepared their reports alone; *infra*, Section 3.

125 But a trial chamber 'may seek the assistance of experts and other bodies': Judgment on the appeals against the order of Trial Chamber II of 24 March 2017 entitled 'Order for Reparations pursuant to Article 75 of the Statute', *Katanga* (ICC-01/04-01/07-3778-Red), Appeals Chamber, 9 March 2018, § 72.

126 Decision on the Procedures to be Adopted for Instructing Expert Witnesses, *Lubanga* (ICC-01/04-01/06-1069), Trial Chamber I, 10 December 2007, § 14.

127 See ICC, 'Application Form: Expert Organizations', available online at https://www.icc-cpi.int/sites/default/files/ICCExpertsFormO_English.docx, at 3.

DOSI challenges that individually focused paradigm. It is frequently gathered by multi-disciplinary groups of persons of varying expertise and levels of experience, working collaboratively.¹²⁸ DOSI may be collected and verified by multiple parties across various platforms.¹²⁹ This collaborative, group-based activity places a significant burden on the lead investigator to ensure coherence and overall standards and procedures applied by the group. Where there is collaboration between civil society groups,¹³⁰ or between State entities and individual volunteers (e.g. the identification of 6 January Capitol rioters),¹³¹ or between international organizations and individual volunteers (e.g. Europol's Trace an Object campaign),¹³² the risk of inconsistent approaches is acute.

The fact that DOSI is typically group-generated is not an absolute bar to its admission *qua* expert evidence.¹³³ The immediate question that would arise is who from the collaborative team should serve as the expert witness or witnesses.¹³⁴ In analogous situations, a single team member has testified as an expert and others provided factual testimony.¹³⁵ Nonetheless, caution must be taken; if the expert has only joined the project *ex post facto*, an opposing party will have strong grounds to object to their testimony, arguing that it cannot comprehensively explore other team members' potential errors and biases.

Howsoever chosen, the designated 'expert' (or experts) should be instructed by the litigant to personally conduct or oversee the analyses. If additional help is necessary, they should be told to explicitly set out the identity and contribution of any other person and include those other persons' CV(s).¹³⁶ During cross-examination, the expert may be asked about additional persons who have assisted with their experiments or analysis and should note the name of any such persons in their expert report.¹³⁷ Under UK law, for example, experts are required to state in their reports not only their own qualifications and the instructions received but also '[i]nformation relating to who has

128 A. Koenig, 'Open Source Evidence and Human Rights Cases: A Modern Social History', in Dubberley, Koenig and Murray (eds), *supra* note 2, 32–47, at 39–40.

129 See D'Alessandra and Sutherland, *supra* note 10.

130 See cooperation between Bellingcat and Forensic Architecture, Bellingcat Investigation Team, "'We are going to surrender! Stop shooting!': Reconstructing Óscar Pérez's Last Hours', Bellingcat, 13 May 2018, available online at <https://www.bellingcat.com/news/americas/2018/05/13/we-are-going-to-surrender-stop-shooting-reconstructing-oscar-perezs-last-hours/>.

131 A. Koenig and L. Freeman, 'Cutting-Edge Evidence: Strengths and Weaknesses of New Digital Investigation Methods in Litigation', 73 *Hastings Law Journal* (2022) 1233–1254, at 1235.

132 Europol, 'Stop Child Abuse—Trace an Object', available online at <https://www.europol.europa.eu/stopchildabuse>.

133 In *Bemba*, one expert testified about a report produced by the 'Human Rights in Trauma Mental Health Laboratory' that she headed; Decision on requests to present additional evidence and submissions on sentence and scheduling the sentencing hearing, *Bemba* (ICC-01/05-01/08-3384), Trial Chamber III, 4 May 2016, § 13.

134 Koenig, *supra* note 128, at 39–40; Koenig and Freeman, *supra* note 10, at 340–341.

135 Koenig, *supra* note 128, at 39–40. See also *R v. Robb* where a phonetician gave expert evidence while the police officers who listened to the same disputed tapes and recognized the voice of the person speaking as the accused were considered factual witnesses.

136 See Amy Hak Forensics Report, *supra* note 36, at 80–81.

137 See *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 6.

carried out measurements, examinations, tests etc and the methodology used, and whether or not such measurements etc were carried out under the expert's supervision'.¹³⁸ Under no circumstances should the expert should try to pass off the work of others as their own expert evidence without acknowledgement.¹³⁹ The DOSI team also should be aware that once testimony begins, the designated member(s) will not be able to communicate with them (barring exceptional permission being granted by the Court). In a recent domestic case, the court explicitly criticized an expert who, after being sworn in, called several people outside of court to discuss issues he was being questioned on.¹⁴⁰

The composition of a DOSI team will be particularly contestable during trial proceedings if the lead investigator, or any other member of the team, is affiliated with one of the parties to the litigation. Such affiliation is not an absolute bar; in the ICC case of *Al-Hassan*, the report of Amy Hak, then a Prosecution Forensic Officer, was submitted during proceedings.¹⁴¹ Further, a number of prosecution analysts have testified in proceedings before the ICTY.¹⁴² However, some judges have considered this inappropriate, such as when Philip Coo's military report was rejected in the *Milutinović et al.* case due to his position as a member of the Prosecution personnel.¹⁴³

The single-expert model would clash with the democratizing trend for collaborative DOSI research, noted above. It is unlikely that one single person will be a sufficient repository of knowledge to be able to testify comprehensively about an entire DOSI investigation.¹⁴⁴ For example, investigators of human rights violations against Rohingya have used both satellite imagery and social media posts to confirm the burning and pillaging of villages by the Myanmar military.¹⁴⁵ An expert on satellite imagery may be reluctant to also testify as an expert on social media posts. Adhering to the single-expert model may undermine the efficiency of a DOSI investigation, by funnelling all information through one person, and thereby creating analytical and decision-making bottlenecks. For these reasons, international courts must be receptive to having more than one member of an DOSI team testify regarding their particular specialized function and findings, or to having a single member testify but with an appreciation that the expert will not have performed

138 *R v. Bowman* [2006] EWCA Crim 417.

139 See *R v. Pabon* [2018] EWCA Crim 420.

140 *R v. Pabon* [2018] EWCA Crim 420, § 58.

141 See *supra* at note 111.

142 See Decision on Defence Rule 94bis Notice Regarding Prosecution Expert Witness Richard Butler, *Popović et al.* (IT-05-88-T), Trial Chamber II, 19 September 2007, §§ 26–27; *Popović Butler Appeals Decision*, § 31 (with further references to case law).

143 Decision on Prosecution Request for Certification of Interlocutory Appeal of Decision on Admission of Witness Philip Coo's Expert Report, *Milutinović et al.* (IT-05-87-T), Trial Chamber III, 30 August 2006, § 1.

144 Koenig and Freeman, *supra* note 131, at 1240.

145 See e.g. Amnesty International, 'Myanmar: "Bullets rained from the sky": War Crimes and Displacement in Eastern Myanmar', 31 May 2022, available online at <https://www.amnesty.org/en/documents/asa16/5629/2022/en/>.

each function underlying the team's findings and may have instead served in a reviewer role. Doctrinally, this means the expert's evidence will be very much opinion in nature rather than a relaying of their direct experiences.¹⁴⁶ This shift towards opinion heightens the need for rigorous standards of review and transparency to be adopted within DOSI teams, as set out herein, and to be vigilantly examined by the Court in hearing and assessing the expert evidence.

In sum, the collaborative nature of DOSI projects presents opportunities for international courts to benefit from highly probative materials, but demands adjustments to the traditional single-expert approach. While this shift may appear seismic to courts habituated to the single-expert model, it reflects a deeper evolution in judicial proceedings (and society more broadly) away from high-status individuals being the exclusive bearers of enlightened knowledge and towards teams of specialized personnel carrying out highly technical projects collaboratively.

C. DOSI Imports Heightened Risks of Error and Conscious or Unconscious Bias

The use of DOSI in legal proceedings results in elevated risks because audio-visual materials can be highly persuasive but may have been gathered on selective bases, whether knowingly or unknowingly. These risks are exacerbated by the team-based nature of DOSI investigations, in which vulnerabilities are potentially multiplied. Moreover, presenting DOSI as evidence involves a shift from a crucible model of justice (focusing as narrowly as possible on contested issues and bringing the witnesses before the judges to test their credibility),¹⁴⁷ to a more flexible approach with diverse and multiple points of truth-testing (some of which may occur outside of any framework designed to ensure reliability).¹⁴⁸ Because of this, ensuring that transparent, accessible and defensible methodologies are adopted is particularly important for DOSI investigations.¹⁴⁹ In particular, DOSI teams should put in place review processes, whereby senior team members check the team's work to ensure its quality and consistency. In addition to adhering to the Do No Harm principle,¹⁵⁰ a looped process should be adopted, whereby

146 See Dwyer, *supra* note 62, at 78; Appazov, *supra* note 5 at 17 (noting that 'in the seventeenth century, a witness's thoughts about a case—his/her opinion about the case as opposed to established facts—were inadmissible [under common law]').

147 The traditional crucible model made each witness personally responsible for the accuracy of their recounted sensory experience. Conversely, DOSI involves multiple people capturing, editing, transferring, and possibly commenting on material that they may not have directly experienced themselves in any conventional respect.

148 See M. Gillett, 'Fact-Finding Without Rules: Habermas's Communicative Rationality as a Framework for Judicial Assessments of Digital Open-Source Information', 44 *Michigan Journal of International Law* (2023) 301–348.

149 See *Lubanga Trial Judgment*, *supra* note 31, § 112.

150 See G. Fiorella, 'How to Maintain Mental Hygiene as an Open Source Researcher', Bellingcat, 23 November 2022, available online at <https://www.bellingcat.com/resources/2022/11/23/how-to-maintain-mental-hygiene-as-an-open-source-researcher/>.

information regarding approaches, standards, and relevant findings is reviewed and relayed with feedback to team members.¹⁵¹ Such rigorous methodologies are critical to reduce the risk of errors and biases remaining undetected and unchallenged.¹⁵²

Surveying the delivery of expert evidence in international criminal justice provides guidance as to the elements of a rigorous methodology. Experts should receive clear instructions from the calling party (or the Court), which should be explained along with their methodology in their report.¹⁵³ In *Al-Hassan*, the video analysis expert was provided with images to geolocate and reference material to compare it with. However, the prosecution's instructions also allowed the expert to rely on 'any other means' in case of 'trouble' conducting the geolocation.¹⁵⁴ The instructions lacked guidance as to whether these 'other means' included searching for images or materials and, if so, whether those searches should be preserved and documented. That type of omission is potentially prejudicial given that materials can disappear from the internet,¹⁵⁵ and given that the defence may have an interest in attempting to replicate the searches to check for any disputable issues that arise.

Regarding transparency and accessibility, a party should ensure that 'sources used in support of any expert witness statement must be clearly indicated and easily accessible to the other party upon request', so that other party can challenge the probative value of such evidence.¹⁵⁶ The failure to do so may impact the weight the judges are willing to place on the report,¹⁵⁷ especially if the expert relies on hearsay to reach their views.¹⁵⁸ In *Bemba et al.*, screenshots from Facebook used by the Prosecutor to link two individuals were challenged by the defence 'on the basis that the ownership of the

151 See W. Fan, 'How to Organize a Collaborative OSINT Project for Litigation Purposes: Takeaways from Project Tollgate', University of Essex Human Rights Centre Blog, 26 May 2022, available online at <https://hrcessex.wordpress.com/2022/05/26/how-to-organize-a-collaborative-osint-project-for-litigation-purposes-takeaways-from-project-tollgate/>.

152 Trevisan, *supra* note 26, footnote 8 citing L. Laving, 'The Reliability of Open-Source Evidence in the International Criminal Court', Lund University Faculty of Law, 11 June 2014, available online at <https://lup.lub.lu.se/student-papers/search/publication/4457910>. See also Berkeley Protocol, at 8: 'Reliability refers to the ability to perform consistently, dependably or as expected'; Minogue, Allen and McDermott, *supra* note 2, § 116.

153 See also Judgment on the appeal of Mr Bosco Ntaganda against the decision of Pre-Trial Chamber II of 18 November 2013 entitled 'Decision on the Defence's Application for Interim Release', *Ntaganda* (ICC-01/04-02/06-271-Red), Appeals Chamber, 5 March 2014, §§ 36, 39–43.

154 See Amy Hak Forensics Report, *supra* note 36, at 80–81.

155 See B. Wille, "'Video Unavailable': Social Media Platforms Remove Evidence of War Crimes', Human Rights Watch, 10 September 2020, available online at <https://www.hrw.org/report/2020/09/10/video-unavailable/social-media-platforms-remove-evidence-war-crimes>.

156 Decision on the 'Prosecution Request for Disclosure of Material Underlying the Defence Psychiatric Expert Report', *Ongwen* (ICC-02/04-01/15-709), Trial Chamber IX, 21 February 2017, § 12. See also e.g. Rule 94*bis* ICTY RPE; Rule 94*bis* ICTR RPE; Rule 116 MICT RPE; Singh, *supra* note 56, at 627.

157 *Bemba et al.* Witness Exclusion Decision, *supra* note 68, § 16.

158 Singh, *supra* note 56, at 628–630.

Facebook account could not be forensically verified and that there was no metadata attached to the screenshots'.¹⁵⁹

Best practices for DOSI investigations already require the maintenance of a trail detailing the collection of information and the chain of custody.¹⁶⁰ This helps to ensure transparency, accessibility and potentially replicability.¹⁶¹ Technical means, such as website capture tools,¹⁶² can help automate the process. However, the trail may only be partial and replication may not be always possible, as there are thousands of automated functions that occur when conducting any online search. Owing to search algorithms, two people searching the same terms may well get differing results. Consequently, whereas experts should seek to adhere to objectively verifiable approaches,¹⁶³ the traditional scientific method of replicability fits awkwardly in the context of DOSI.

This incongruity re-emphasises the need for clear guidelines to be adopted, or at least common understandings among the judiciary, the parties, and the broader DOSI community to be reached regarding the admissibility and weight of expert evidence regarding DOSI.¹⁶⁴ The difficulty in replicating searches may eventually be overcome as technology advances. But, in the interim, it will require the judiciary to ensure that DOSI experts are vigorously examined regarding their methods, while at the same time appreciating the algorithmic penumbra of uncertainty and individuality accompanying DOSI analyses.

Identifying the origin and creator of DOSI materials, where possible, will be important for assessing their weight and admissibility.¹⁶⁵ Evidence based on anonymous sources has become a pariah category at the ICC,¹⁶⁶ with Chambers holding that open source news articles can be admitted only if the background and qualifications of the journalists or of their sources are sufficiently established regarding their objectivity and professionalism.¹⁶⁷

159 International Bar Association, *supra* note 48, at 27. Although the judges permitted this to be submitted — in other circumstances a different approach may be taken, particularly if it constituted critical evidence underlying a conviction.

160 Berkeley Protocol, §§ 153–175.

161 Already evidence has been rejected in ICC proceedings where it has come from a URL that cannot be retrieved; see Decision on the submission as evidence of items used during the questioning of witnesses but not submitted as evidence by the parties or participants, *Bemba* (ICC-01/05-01/08-3034), Trial Chamber III, 7 April 2014, § 63.

162 See e.g. Hunch.ly, a website capture tool that is widely used by digital investigators to automatically take screenshots and annotate webpages visited during an investigative session.

163 See L.B. de Chazournes, 'Introduction: Courts and Tribunals and the Treatment of Scientific Issues', 3 *Journal of International Dispute Settlement* (2012) 479–481.

164 Gillett, *supra* note 148.

165 F. Sampson, 'Intelligent evidence: Using Open Source Intelligence (DOSI) in Criminal Proceedings', 90 *The Police Journal: Theory, Practice and Principles* (2017) 55–69, at 61.

166 See e.g. *Katanga and Ngudjolo* Bar Table Motions, *supra* note 78, § 29; Decision on the confirmation of charges, *Mbarushimana* (ICC-01/04-01/10-465-Red), Pre-Trial Chamber I, 16 December 2011 ('*Mbarushimana* Confirmation Decision'), § 78.

167 *Katanga and Ngudjolo* Bar Table Motions, *supra* note 78, § 31.

Underlying the rebuke of anonymous hearsay are the concerns that the opposing party's ability to challenge the evidence will be undermined,¹⁶⁸ and that the information may originate from a misleading source.¹⁶⁹

Wherever possible, DOSI teams should triangulate evidentiary materials, in order to demonstrate the probative value of their expert evidence.¹⁷⁰ This should include checks against reference materials taken from as close as possible to the time of the item being tested, such as the appearance of a person (or sound of their voice)¹⁷¹ or building,¹⁷² or other item, as these can change over time. Any alterations to the materials being examined, for instance to enhance their visibility or audio properties (denoising), should be explicitly acknowledged.¹⁷³

At the same time, teams should avoid attempting to step into the judges' shoes to determine the ultimate issues.¹⁷⁴ Terminologically, judicial phrasing like 'beyond reasonable doubt' should be avoided. As an alternative, the voice comparison expert in *Al-Hassan* used terms like 'strongly supports' and 'slightly supports' to explain his findings.¹⁷⁵

DOSI teams should also be aware of the wider context of potential human rights protections. The potential to infringe on privacy is a critical matter.¹⁷⁶ Experts should ensure that depicted persons have consented to the dissemination of their image or that there is a legitimate forensic purpose to show them. Measures such as image and voice distortion can mitigate incursions into privacy. If DOSI experts present additional materials they themselves have obtained in order to triangulate the materials that they are verifying, they should be again careful to avoid unjustifiably violating privacy rights and the dignity of other witnesses, victims and third parties.

At the normative level, legal regulations or a similar binding instrument on expert evidence and DOSI, with status under Article 21 of the Rome Statute (such as amendments to the Rules of Procedure or Evidence, Regulations of the Court, or otherwise qualifying as a source under Article 21), would

168 *Mbarushimana* Confirmation Decision, *supra* note 166, § 40; ICC: *Gbagbo* Confirmation Adjournment, *supra* note 82, § 29.

169 Dissenting Opinion of Judge Christine Van den Wyngaert, Judgment on the appeal of Mr Bosco Ntaganda against the decision of Pre-Trial Chamber II of 18 November 2013 entitled 'Decision on the Defence's Application for Interim Release', *Ntaganda* (ICC-01/04-02/06-271), Appeals Chamber, 5 March 2014, § 4.

170 Judgment, *Krstić* (IT-98-33-T), Trial Chamber, 2 August 2001, § 108.

171 *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 33, 35–36.

172 See the cross-examination of Andras Riedlmayer in the *Šešelj* case: Public Transcript of Hearing, *Šešelj* (IT-03-67), Trial Chamber, 27–28 May 2008.

173 *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 37–38.

174 Public Transcript of Hearing, *Mladić* (IT-09-92), Trial Chamber, 13 August 2015, 37746–37747; ICC-02/04-01/15-T-20-Red-ENG WT 21-01-2016 1/83 SZ PT, *Ongwen* (ICC-02/04-01/15-T-20-Red-ENG), Pre-Trial Chamber II, 21 January 2016, at 44, lines 8–24; Decision on the confirmation of charges against Dominic Ongwen, *Ongwen* (ICC-02/04-01/15-422-Red), Pre-Trial Chamber II, 23 March 2016, § 51.

175 *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 19 (also translated as 'reinforces' and 'lightly reinforces').

176 See Hellwig, *supra* note 14, at 984–986.

provide the highest level of consistency of practice regarding this type of evidence.¹⁷⁷ The formalization of practice into the prescriptive law would signal the maturation of DOSI into a recognized area of forensically relevant specialization. It would also reflect the growing importance of DOSI for the resolution of atrocity crimes cases. Pending the adoption of such regulatory provisions, the DOSI community will remain unanchored when predicting who may qualify as an expert in this domain, who should be called as a rebuttal expert, and how the probative value of DOSI materials will be assessed.¹⁷⁸ In this context, the criteria in the next section are set out as a guide to assist the identification of DOSI experts.

5. Criteria for Classification as a DOSI Expert Witness

The growing prevalence and forensic significance of DOSI demands standards that are clear, accessible, objectively justifiable, and non-biased for its presentation to international courts such as the ICC.¹⁷⁹ It is important that the Court maintain a rigorous approach to admission as an expert, particularly given DOSI's easy accessibility and potential for misinterpretation and manipulation. With these objectives in mind, a list of factors designed to assist in determining whether a person has the specialized skill or knowledge in the DOSI field to give expert evidence is set out below. The list is based on relevant jurisprudence and national laws, including in the US¹⁸⁰ and UK,¹⁸¹ where considerable litigation has addressed digital evidence.

177 See da Silva, *supra* note 2, at 960–962; Hellwig, *supra* note 14, at 987. See *infra* for the amendment processes at the ICC.

178 MacLean, *supra* note 16, at 86.

179 See Hellwig, *supra* note 14, at 986–987; R. Stoykova, 'Digital Evidence: Unaddressed Threats to Fairness and the Presumption of Innocence', 42 *Computer Law & Security Review* (2021), at 12.

180 US courts established in *Daubert* that beyond having the 'scientific, technical or other specialized knowledge [that] will assist the trier of fact to understand the evidence or to determine a fact in issue', experts must meet a four-part threshold test in terms of their methodology and findings: (1) is the subject of expert testimony falsifiable or testable?; (2) is the testimony derived from techniques with known error rates (also stated as 'the testimony is the product of reliable principles and methods'); (3) has the testimony been subject to peer review? and (4) is the testimony generally accepted in the scientific community? The *Daubert* principles were later codified in the Federal Rules of Evidence, conflating relevance and reliability.

181 Under UK law, the factors that the Court may consider in determining the reliability of a proposed expert are:

- the nature of the data on which the expert's opinion is based;
- the safety or otherwise of inferences drawn;
- the nature of methods used;
- the extent to which any material upon which the expert's opinion is based has been peer-reviewed;
- the extent to which the expert's opinion is based on material falling outside the expert's own field of expertise; and
- whether the expert's methods followed established practice in the field.

While the factors are listed in the order they would typically be considered when determining expertise, it is not intended to be an inflexible order. Moreover, there is not necessarily a hierarchy of significance among the factors. However, some factors are particularly significant, such as the first one, as discussed below. It is also not intended that all the factors are cumulative. Instead, they are a set of considerations to be taken into account in their totality in order to guide the chamber's evaluation (and parties, and DOSI community more broadly) regarding who may qualify as a DOSI expert.

A. Demonstrable Experience and Competence

The first, and most important criterion for DOSI witnesses is demonstrable experience and competence in applying the relevant expertise. This would typically be shown through a portfolio (or record) of past or ongoing projects, along with the outputs or outcomes of those projects, ideally submitted to reputable institutions. Experience and competence can augment (and potentially substitute for) formal qualifications, as long as the high quality and coherence of the work is evident.¹⁸² Extensive experience in technical testing can assist; a factor in recognizing the audio voice comparison expert in *Al-Hassan* as an expert was his 10 years working on this field.¹⁸³

B. Prior Recognition as an Expert Witness

Second is any prior recognition as an expert witness (whether before an international or national judicial body) on a substantially similar area of expertise. Such recognition will serve as an indicator of the proposed expert's specialized skill and/or knowledge. This is consistent with the current approach on the application form to be listed as an expert.¹⁸⁴ However, a proposing party should disclose any information indicating that the putative expert's status was undermined in prior proceedings, for example on cross-examination.¹⁸⁵

See Criminal Practice Directions 2015 [2015] EWCA Crim 1567, § 19A.5 cited in Minogue, Allen and McDermott, *supra* note 2, § 33.

182 See e.g. Judgment pursuant to Art. 74 of the Statute, *Bemba* (ICC-01/05-01/08-3343), Trial Chamber III, 21 March 2016, § 233; *Lubanga* Trial Judgment, *supra* note 31, § 112.

183 See *supra* Section 3.

184 See *supra* Section 3.

185 Such material would potentially affect the credibility of the Prosecution evidence and therefore be subject to mandatory disclosure by the Prosecution under Art. 67(2) ICCSt. Alternatively, it would be 'material to the preparation of the defence' and therefore subject to disclosure under Rule 77 barring any applicable exception.

C. Academic and Professional Qualifications

Third is academic and professional qualifications (or formal courses undertaken).¹⁸⁶ This will signal a record of meeting established benchmarks and also that the expert has benefitted from instruction by experienced persons used to dealing with technical and systemic questions. Here, the ICC expert application form prominently refers to formal education and requests a copy of the applicant's certification with the regulatory or professional body with which they are registered. However, the lack of overarching DOSI professional or regulatory bodies (though there are some bodies in sub-areas related to DOSI) potentially conflicts with the tenor of this requirement,¹⁸⁷ prompting calls to generate a form of DOSI certification or qualification with State-level recognition, as discussed herein.

D. The Demonstrable Knowledge or Skill Exceeds that Normally Available to the Fact-finder

Fourth, possessing knowledge or skill that is demonstrably beyond that normally available to the fact-finder will be an important factor in determining expert status.¹⁸⁸ Given the highly accessible nature of DOSI, it will be incumbent on the proposing party to show why the specialist's evidence exceeds that available to a well-informed lay person. There is a vast range between the technical capacity of participants in DOSI investigations, from inexperienced newcomers to highly seasoned and technically proficient professionals, as can be seen by the work of DOSI experts in the MH17 litigation.¹⁸⁹ Maintaining a strict insistence on this criterion is important because (i) the judges themselves should possess or obtain readily accessible information or knowledge; (ii) allowing expert evidence from persons without knowledge or skill exceeding the norm would beg the question of why all other witnesses are prevented from providing opinion evidence; and (iii) the risk of misinterpretations and errors is generally higher if a person has not developed a specialized level of knowledge or skill, as they may not be aware

186 See *supra* Section 4.A, on overarching DOSI qualifications.

187 See *supra* Section 4.A.

188 See *Semanza* Appeal Judgment, *supra* note 64, § 303; Judge Korner's ruling as summarized in Minogue, Allen and McDermott, *supra* note 2, § 80. See also Bingham LJ in *R v. Robb* (holding that the phonetician was 'well qualified by academic training and practical experience to express an opinion on voice identification. We do not doubt that his judgment, based on close attention to voice quality, voice pitch and the pronunciation of vowels and consonants, would have a value significantly greater than that of the ordinary untutored laymen, as the judgment of a hand-writing expert is superior to that of the man in the street').

189 DOSI experts were able to point out that although Russia was correct in claiming that the metadata showed 16 July 2014 on a key video, which was a day earlier and expected, this was because 'at the time of the video's uploading in 2014, a glitch in an open source video format conversion algorithm used by Google structurally caused videos to be uploaded with a timestamp preceding the actual upload time by approximately 24 hours. In fact, up until 2019, all videos uploaded to YouTube on 17 July 2014 carried a metadata timestamp of 16 July 2014'; see Bellingcat, *supra* note 21.

of important contextual factors for interpretation, methodological pitfalls and past instances of erroneous views being reached in the field of study.

E. Commitment to Ethical Duties

Fifth, it is important to ensure that experts understand and observe their ethical duties, including integrity, objectivity and neutrality.¹⁹⁰ In relation to the gun-for-hire approach that has developed in some spheres regarding expert testimony, courts have often lamented that ‘... the unsatisfactory, as well as dangerous, character of this kind of evidence is well known; [e]xperts are nowadays often the mere paid advocates or partisans who employ and pay them, as much as the attorneys who conduct suit’.¹⁹¹ Ideally, the proposed expert should have completed ethics training — ensuring that they are aware of the impact of their work on victim communities, and their awareness of essential precepts such as the Do No Harm principle, the principle of informed consent and appropriate frameworks for questioning witnesses.¹⁹²

F. Integration of Peer Review into Working Methodology

Finally, as a sixth factor, a level of peer review should feature in the proposed expert’s methodology.¹⁹³ Although this is less a personal characteristic than a way of conducting the task, it is an important indicium of commitment to generating accurate and defensible results. This would not only reduce the risks of errors in assessment creeping in, but would also foster a more scientific approach, and generation of standards, within the DOSI community. That could in turn contribute to the establishment of a broader type of formal certification or qualification in this area.

G. Overarching Considerations

The fourth, fifth and sixth proposed factors, in particular, are directed to the risks of Lord Bingham’s ‘quacks, charlatans, or enthusiastic amateurs’. If a party is permitted to call an expert witness who lacked sufficient rigour in their methodology, or whose methodology cannot be tested, the burden will be placed on the opposing party to unfairly counteract evidence that should not be laid against it. For criminal defendants, serious human rights issues could arise from such curtailment of their ability to challenge the evidence

190 See Decision on Defence Preliminary Challenges to Prosecution’s Expert Witnesses, *Ntaganda* (ICC-01/04-02/06-1159), Trial Chamber VI, 9 February 2016, § 9. See also Trial Judgment, *Ongwen* (ICC-02/04-01/15-1762-Red), Trial Chamber IX, 4 February 2021, § 2531.

191 Minnesota Supreme court decision of *Keegan v. Minneapolis & St Louis Railroad* cited in Milroy, *supra* note 65, at 520.

192 See Berkeley Protocol, *supra* note 11, at 11–13.

193 See e.g. Criminal Practice Directions 2015 [2015] EWCA Crim 1567, § 19A.5 cited in Minogue, Allen and McDermott, *supra* note 2, § 33.

against them, implicating Article 67 of the ICC Statute. For the experts themselves, they may face suits for negligence based on their testimony¹⁹⁴ and so have a professional and fiscal motivation to avoid exceeding the ambit of their expertise and opining on matters on which they are not truly expert.

In expanding the range of persons considered to be experts and in formulating criteria which should be taken into account, the Court may face accusations of arbitrariness and potential biases. The ICC must conduct its procedures without any discrimination on prohibited grounds.¹⁹⁵ Insisting on a high level of technical skill, knowledge or specialization does not violate any of those grounds. However, restricting those who can qualify as experts to persons from specific institutions, such as elite colleges, or with access exclusive to certain qualifications, will risk running afoul of these important protections and undermine the increased accessibility of DOSI materials to populations, including victim groups around the world.¹⁹⁶

Courts have long been wary of experts being tainted by bias due to the instructions or fees that they receive from a party to proceedings.¹⁹⁷ The potential for improper personal connection is reflected in the ICC's application forms to be listed as an expert (or expert organization), which ask about connections with any person participating in the Court's proceedings or with a staff member of the Court.¹⁹⁸ The Regulations of the ICC's Office of the Prosecutor confirm that it must implement bias controls but provide no detail as to how this should be achieved, and provide no guidance as to the instruction of experts to this end.¹⁹⁹ That is a significant lacuna, as experts in areas relevant to DOSI will be questioned about biases, including cognitive biases.²⁰⁰

It is important that the Court considers how to address potential biases in relation to DOSI,²⁰¹ including conscious political or social biases, to unconscious prejudices, to algorithmic biases that are extremely hard to detect.²⁰² One means of controlling biases is to encourage the parties to jointly instruct expert witnesses, as the Court attempted in *Lubanga*, so that 'the single expert will not be in any sense influenced, however unconsciously, by the viewpoint of only one party' and therefore 'he or she will be particularly able to present

194 See *Jones v. Kaney* (2011) UKSC 13 cited in Milroy, *supra* note 65, at 526.

195 See *supra* Section 4.A.

196 D'Alessandra and Sutherland, *supra* note 10, at 14; Wiley, *supra* note 98, at 547.

197 Singh, *supra* note 56, at 645.

198 See ICC, 'Experts', *supra* note 59, at 2.

199 Regulation 24, Regulations of the Office of the Prosecutor (ICC-BD/05-01-09), 23 April 2009.

200 See e.g. *Al Hassan* 15 October Trial Transcript, *supra* note 106, at 58.

201 Vecellio Segate, *supra* note 13, at 255.

202 See N. Milaninia, 'Biases in Machine Learning Models and Big Data Analytics: The International Criminal and Humanitarian Law Implications', 102 *International Review of the Red Cross* (2021) 199–234. See also Minogue, Allen and McDermott, *supra* note 2, §§ 98–102; McDermott, Koenig and Murray, *supra* note 2, at 6; D. Simon, *In Doubt: The Psychology of the Criminal Justice Process* (Harvard University Press, 2012), at 38.

a balanced view of the issues'.²⁰³ However, that control mechanism only addresses potential external influences from parties to litigation. It does not directly counter the possibility of internal biases, particularly of an unconscious form, from affecting the reliability of the evidence.²⁰⁴

To insulate against those challenges, the ICC should ensure that its approach to extending the definition of an expert on DOSI (or applying the existing definition in a more extensive way) is both (i) formulated in a transparent and objective way; and (ii) based on ongoing interaction with the DOSI sub-community (so as to keep pace with the rapidly developing technology and also the advancing misuse of this technology to manipulate potential evidence).²⁰⁵ Through meeting with the DOSI community to exchange information regarding qualifications and industry-standards, the ICC can refine and integrate criteria, such as those proposed above, into its jurisprudence, and thereby provide heightened consistency and objectivity into its approach to determining DOSI expert status, while mitigating the risk of biases affecting its approach. This will be particularly important in relation to platforms and media with new features and functionality, such as the incorporation of AI, in order to make sure that the Court has the substantive understanding and lexicon to conduct the necessary assessments and to articulate their reasons regarding the admission and reliance on DOSI materials.

6. Conclusion

When the ICC commenced operations in 2002, the digital age was in its infancy. In the two decades since, the growing ubiquity of digital recording devices and the ease of transferring files has led to an exponential increase in the availability of videos, images and other DOSI for forensic proceedings.²⁰⁶ Whereas the *ad hoc* tribunals for the former Yugoslavia and Rwanda were essentially pre-DOSI international courts, the first twenty years of the ICC's operations can be seen as the digital dawn, with DOSI being used sporadically and largely collaterally to traditional forms of evidence. Reflecting the collateral and incidental role of DOSI in that era, the judicial approach to DOSI at the ICC has been *ad hoc*, variable and largely reliant on simply transposing the broadly framed Rules of Procedure and Evidence to this new type of evidence. Two decades on, DOSI is being submitted to the Court in greater quantity and with greater forensic relevance than ever. Current conflicts and crises, such as those in Libya, Ukraine and Palestine

203 Decision on the Procedures to be Adopted for Instructing Expert Witnesses, *Lubanga* (ICC-01/04-01/06-1069), Trial Chamber I, 10 December 2007, § 15.

204 See Milaninia, *supra* note 202, at 199–234.

205 The ICC has a Scientific Advisory Board and a Technology Advisory Board, which should facilitate ongoing interactions and dialogue with the DOSI specialist community. See Koenig, *supra* note 128, at 34.

206 Vecellio Segate, *supra* note 13, at 244.

demonstrate that DOSI will inevitably play a core role in judicial determinations of the outcome of trials.

As DOSI becomes more prevalent in international criminal proceedings, so too will the risks of its being misinterpreted. D'Alessandra and Sutherland observe that 'in a "post-truth" world, the camera often lies'.²⁰⁷ To counteract this risk, opposing parties will contest the presentation of DOSI in court, as well as its reliability, and use by the judges in reaching their verdicts. Technical challenges typically call for expert assessment and evidence. However, the ICC framework on DOSI expert evidence is embryonic. Key challenges arise from the nature of DOSI, including its straddling of expert and lay person domains, the group-based nature of the teams that assess it, and the potentially misleading aspects of DOSI and biases that may impact its interpretation.²⁰⁸

Judges should maintain a firm distinction regarding the category of expert witnesses and ensure a high standard is adhered to for this privileged class of witness in international proceedings.²⁰⁹ In particular, judges should develop criteria that are clear, objectively justifiable, accessible, non-biased, but also sufficiently flexible to adapt to emerging forms of relevant expertise. The six criteria proposed above provide a novel combination to recognize and regulate the delivery of DOSI expert evidence. Nonetheless, the judiciary should not passively defer to DOSI experts, but should undertake training on DOSI.²¹⁰ In this way, judges' technological literacy could be augmented, in line with calls from the Independent Expert Review.²¹¹ At the same time, as the judges' competence in digital materials grows, the bar for the qualification as an expert may also rise commensurately, as a function of the requirement that the expert's specialized skill lies outside the knowledge of the bench.²¹²

For the DOSI community, the generation of a set of principles would assist in having their expertise recognized for formal qualification as experts. But for specific DOSI specialists, ensuring that their teams adopt clear and defensible methodology, a transparent approach, peer-review, as well as an internal review process will assist their findings to be accepted by the judges in international criminal litigation.

DOSI challenges the binary between experts and regular fact witnesses. In response to that challenge, the Court should ensure rigorous standards of fact-finding and technical assessment on the part of experts, while also shifting to a more experience and skills-based approach to determining expertise, in lieu of traditional models based largely on reputation and formal qualification from elite institutions. On the part of the DOSI community,

207 D'Alessandra and Sutherland, *supra* note 10, at 24.

208 See e.g. D'Alessandra and Sutherland, *supra* note 10.

209 See Richmond and Sebastiano, *supra* note 5, at 1027.

210 See Freeman and Vazquez Llorente, *supra* note 23.

211 *Review of the International Criminal Court and the Rome Statute System*, ICC-ASP/18/Res. 7, 30 September 2020, §§ 139–141; 554.

212 See *supra* Section 3.

efforts should be made to adopt overarching qualifications, with appropriate attention given to technical skills, robust and transparent methodology, and ethical considerations. This challenge is a fruitful one, which portends deeper benefits for the Court, the parties to litigation and the broader epistemic community interested in the establishment of truth and responsibility for the gravest crimes plaguing the world.