Challenging Electronic Systems’ and Devices’ Ability to Produce Reliable Evidence

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1. INTRODUCTION TO THE PROBLEMS OF CHALLENGING TECHNOLOGY’S EVIDENCE

Most of the evidence used for legal proceedings and legal services now comes from complex electronic systems and devices, including the data that is the basis of expert opinion evidence. But, as revealed in case law, few lawyers are able to challenge the reliability of such sources. Regardless, judges’ decisions must be based upon the evidence and argument provided by the lawyers who appear before them. So it is that the case law lacks technological adequacy both substantively and procedurally. As a result, the changes and flexibility in the procedures for dealing with such evidence that differences in the technologies that produce such evidence should dictate, do not exist.2 The rules of procedure that govern proceedings concerning discovery,


2 For example, s. 30 of the Canada Evidence Act still dominates admissibility proceedings in regard to electronically-produced records, which are now the most frequently used kind of evidence. But s. 30 is obsolete. It was enacted in 1969 when electronic sources of evidence were still far off in the future. But the electronic records provisions, ss. 31.1-31.8 of the Canada Evidence Act, which incorporate the “systems integrity” concept (s. 31.2(1)(a)), which is the foundational principle of electronic records management systems technology, is not
disclosure, and admissibility of evidence should be made to apply flexibly to fit each different technology that produces the evidence being dealt with. That is particularly important for those sources of very frequently used kinds of evidence, such as:

(1) electronic records management systems (records now being the most frequently used kind of evidence);

(2) mobile phone tracking evidence (because we all carry mobile phones that continuously tell the electronic world where we are);

(3) breathalyzer/intoxilyzer device blood-alcohol-content (BAC) readings (being the foundation evidence for thousands of impaired driving and “over 80” prosecutions—
Criminal Code s. 253), and,

(4) TAR (technology assisted review) software programs that are used to conduct the “records review stage” of electronic discovery in civil proceedings that do the “reading-for-relevance-and-privilege” of large quantities of records, including email and text messages.

I have dealt with the admissibility and other procedural issues concerning evidence produced by these technologies elsewhere.³

The law’s utility and efficacy are in fact controlled by the following problems concerning the resources provided to the justice system as a whole, including the education of lawyers, and the effectiveness of law societies in enforcing their competence and ethical practice:

1. Lawyers don’t know the technology that produces most of the evidence used for legal proceedings and legal services. They may know well the mechanical and electrical systems and devices they grew up with, but not know sufficiently well the electronic systems and devices that now provide the foundation for our lives. Therefore, they don’t challenge the performance of such sources of evidence as to their reliability.

applied, and all but ignored. Compare for example: (1) the simplistic treatment of technology’s sources of evidence in this article by David M. Paciocco (now a justice of the Court of Appeal for Ontario), “Proof and Progress: Coping with the Law of Evidence in a Technological Age” (2013), 11 Canadian Journal of Law and Technology 181, which article was heavily relied upon in pre-murder trial voir dire concerning the admissibility of mobile phone tracking evidence in, R. v. Oland 2015 NBQB 245; with, (2) the considerable technical detail as to mobile phone tracking evidence provided by this article: R.P. Coutts and H. Selby, “Problems with cell phone evidence tendered to ‘prove’ the location of a person at a point in time” (2016), 13 DE&ESLR 76-87 (the, Digital Evidence and Electronic Signature Law Review, pdf.), online: , <http://journals.sas.ac.uk/deeslr/article/view/2298>.Re Oland, see also infra notes 4, 6, 36, 43, 52 and accompanying texts.


“Electronic Discovery’s ‘Records Review Stage’ Software Programs” (SSRN, October 1, 2018, pdf.), 20 pages, online: <https://ssrn.com/abstract=3249484>;


Electronic copy available at: https://ssrn.com/abstract=3378077
They are in fact far from infallible sources—the more complex a technology, the more ways it has to break down or otherwise perform inadequately. As a result, it is very unlikely that more than a very few lawyers can present arguments that the rules of procedure concerning the reliability of evidence, should vary with the nature of the technology that produces the various kinds of frequently used evidence.

That variety should now dictate that the rules of procedure in regard to an “admissibility of evidence” *voir dire*, and other such adjunct proceedings, be flexibly applied due to the great variety in the nature of the technologies that are the sources of evidence. The application of procedural rules for such *voir dires* should therefore have regard to: (1) the kind of evidence and witnesses the proponent of admissibility should be required to produce in order to establish, “circumstantial guarantees of trustworthiness”; (2) at which point “the onus of proof” will be transferred to the opponent of admissibility to provide “evidence to the contrary”; (3) if it exists, how the obtaining, preservation, and production of such “evidence to the contrary” can be achieved by the opposing party; and, (4) how difficult it is to do so. These four factors are interdependent factors in that for example, the more evidence and witnesses the proponent has to adduce, usually the easier it is for the opposing party to have access to whatever “evidence to the contrary” there might be. And for example, how important is the evidence to the proceedings. That is to say, there is a “proportionality” analysis that should be conducted. And, those four factors bear upon “the fairness of the trial” as a whole, including providing an adequate “opportunity to make full answer and defence,” as is required by *Canadian Charter of Rights and Freedoms* ss. 7 and 11(d).

But that analytical sophistication doesn’t yet exist in the case law because such refinements of the procedural rules were not considered necessary when technology meant mechanical and electrical systems and devices, without the greater complexity of electronic systems and devices. The law is to be a reflection of reality, but it is always playing “catch-up,” *i.e.*, lags behind what reality needs by way of legal infrastructure for its adequate regulation.

An example of required flexibility in the rules of procedure governing admissibility *voir dires*, which flexibility does not currently exist, is provided by the complexity of the technology that makes available now frequently used mobile phone tracking evidence—frequently used because we all carry mobile phones, and frequently evidence as to where a person was at the time of a particular call to, or from that person’s phone is relevant and important evidence. If Crown Counsel (or plaintiff) has to call as witnesses the engineers and technicians who know and are responsible for the maintenance and performance of the mobile phone communications system, then the defence does not have to apply for an *O’Connor* order (or order for examination of property) to have access to that system to test its performance, and go to the expense of hiring the experts who can conduct such an examination.4

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But how must such information and education be provided to lawyers who want and need it, both as to existing as well as to future complex technologies that produce very frequently used kinds of evidence? Whose duty is it to fill this hole in lawyers’ education, the law society’s or the law school’s?

2. And so there is a probability of upcoming friction between law societies and law schools as to who should be responsible for that part of a lawyer’s education as to the relationship between law and those technologies that produce most of the evidence used in legal proceedings and for legal services. Should it be law school courses, or the continuing professional development requirements (CPD/CLE hours/points) that practicing lawyers are required by their law societies to obtain each year? But law society benchers-managers are also practicing lawyers. The more that law society benchers can impose upon law schools by way the law society’s “approval power” over law school curricula, the less that law society benchers have to do and be responsible for. And so, law societies have suggested that law schools produce “practice ready lawyers” as a condition of having their graduates accepted by law societies as candidates to be “called to the bar” to be practicing lawyers.5

3. But law schools don’t teach courses on the necessary interdependence between different kinds of technology and the necessary flexibility of rules of procedure as they should be applied in regard to, electronic discovery, disclosure, preliminary inquiries, presumptions and inferences, and admissibility voir dires.6

and 3, and infra notes 6, 15, 37, 44, and 53, and accompanying texts, concerning the Oland decisions wherein such evidence was critically important to the conviction for second degree murder, R. v. Oland 2016 NBQB 43 (CanLII; being the decision on parole eligibility; life imprisonment being mandatory). Such test results as to the operation of the mobile phone communications system not having to be adduced by the Crown, and not being in the possession of the Crown or police, the defence would have to bring an O’Connor application for access to the system pursuant to, R. v. O’Connor, 1995 CanLII 51 (SCC), in order to have its experts determine the reliability of the system that produced the evidence in question. Or in civil proceedings, make an application for an order to examine property pursuant to the Rules of Civil Procedure.


6 See for example, R. v. Oland 2015 NBQB 245, and, R. v. Oland 2015 NBQB 244, being two pre-trial voir dires concerning the admissibility of mobile phone tracking evidence for a second degree murder trial. That evidence was critically important to the resulting conviction; see: R. v. Oland 2016 NBQB 43 (the “decision on sentence”). However, Dennis Oland has been granted a new trial which began in November, 2018; see: R. v. Oland 2016 NBCA 58, (leave for a further appeal to the Supreme Court of Canada refused (July 13, 2017)). See also infra note 15 and accompanying text. A recent example from the Supreme Court of Canada as to the burden of proof for rebutting a presumption as to the reliability of technology that produces very frequently used evidence is, R. v. Cyr-Langlois, 2018 SCC 54 (December 6, 2018), the indexing atop the Court’s headnote states: “Driving with blood alcohol level over legal limit— Evidence — Statutory presumptions of accuracy and identity for breathalyzer test results — Burden of proof for rebutting presumptions —
4. The underfunding of the justice system has had a substantial impact upon procedural law. There are never enough courts, judges, court administration staff members, Crown prosecutors, and Legal Aid funding. And so there are concerns as to “justice delayed is justice denied.” Consequentially, there is a

Scope of evidence that must be adduced to rebut presumptions — Whether evidence that is purely theoretical is sufficient to show that improper operation of breathalyzer tends to cast doubt on reliability of results.” And see also supra notes 2 and 4, and infra notes 15, 36, 43, and 52 and accompanying texts.

Roy McMurtry, who was the Attorney General of Ontario, 1975-85, states in his book, Memoirs and Reflections (University of Toronto Press, 2013), at p. 209:

… I regretted the often lengthy delays between the laying of a charge and the actual trial — delays caused by many reasons including, at times, the behaviour of judges and of Crown and defence attorneys. These challenges were exacerbated by the traditional underfunding of the administration of justice in Ontario. The longer I served as attorney general, the more I became aware of the huge pressures on the public treasury. Compared with health, education, transportation, and social services, the justice system was seldom regarded as a major government priority. Taxpayers are aware of the relevance of these other priorities in their own lives, but they generally never expect to be in a courthouse as a litigant in either a civil or criminal trial.

Unfortunately, in recent years the court backlog has increased dramatically. These long delays in the criminal justice process in particular are an embarrassment for governments both provincially and federally.

In contrast, currently (December, 2018), the Ontario Ministry of the Attorney General’s website states:

Criminal Justice System Modernization [online]:
<https://www.attorneygeneral.jus.gov.on.ca/english/criminal_justice_modernization/index.php>

Ontario is improving the criminal justice system by speeding up the resolution of criminal cases.

Ontario’s plan will deliver new courtroom resources — including more judges, Crown attorneys, duty counsel and court staff — to focus on early case resolution and increase capacity in the system. It will also introduce innovative new programs to speed up decision-making at the bail stage and ensure low-risk vulnerable individuals have safe options for release in appropriate cases.

While keeping public safety a priority, Ontario is taking the following steps to help create a better-performing criminal justice system:

Public Reporting
The ministry has been working together with the Ontario Court of Justice on improving public reporting on all criminal justice matters.

This collaboration has resulted in creating “dashboards”, a statistical report that provides criminal court information on the progress of all cases from the bail phase to completion of trial in the Ontario Court of Justice at the provincial and local levels.

Dashboards are available on the Ontario Court of Justice’s website, and will be updated quarterly.

8 See: Ken Chasse, “No Votes in Justice Means More Wrongful Convictions” (SSRN, June 10, 2016, pdf.), online: <https://ssrn.com/abstract=2790625>. This paper analyzes the consequences of the underfunding of the justice system, particularly so, the delaying of trials, unconscionably long pre-trial custody, and very poor jail conditions for such custody. And see, R. v. Jordan 2016 SCC 27, which established a presumption of undue trial delay of 18...
strong desire to limit the length of legal proceedings so as to control their cost. Therefore, there is an intense effort to limit the issues to be decided, and to reduce the procedures in processing cases through the courts’ systems, *i.e.*, it results in a strategy of “cutting costs by cutting the competence of legal proceedings to do justice.”

5. But because most of the evidence used in legal proceedings now comes from complex electronically-based systems and devices, it must be expected that there will be more issues for proceedings such as discovery and admissibility of evidence. Therefore, legal proceedings will take longer and be more expensive. Consider the impact that the transition from mass transportation based upon horses to motor vehicles has had on the law and upon the time required by, and the cost of legal proceedings. For example, records are now the most frequently used kind of evidence, but almost all of them come from large, complex electronic records management systems. Their reliability is not being challenged as to, for example, revealing the frequency with which they lose and destroy records and corrupt the data within records, and months for trials of summary conviction offences, and 30 months for trials of indictable offences.

9 For example, *Bill C-75* (Third Reading in the House of Commons, Dec. 3, 2018, and now in the Senate (as of March 20, 2019), will eliminate the availability of a preliminary inquiry for all offences except those that can result in life imprisonment, and the presiding judge will be able to limit the issues and the witnesses to be heard. A case law example is the Supreme Court of Canada’s very stern language to limit the cost of legal proceedings in its “disclosure” decisions in: *R. v. McNeil*, 2009 SCC 3, at para. 29; being language carried forward from, *R. v. O’Connor*, 1995 CanLII 51, at para. 25; and, *R. v. Chaplin*, 1995 CanLII 126, at paras. 32 and 35:

[29] It is important to repeat here, as this Court emphasized in *O’Connor*, that while the likely relevance threshold is “a significant burden, it should not be interpreted as an onerous burden upon the accused” (para. 24). On the one hand, the likely relevance threshold is “significant because the court must play a meaningful role in screening applications ‘to prevent the defence from engaging in ‘speculative, fanciful, disruptive, unmeritorious, obstructive and time-consuming’ requests for production’” (*O’Connor*, at para. 24, quoting from *R. v. Chaplin*, 1995 CanLII 126 (S.C.C.), [1995] 1 S.C.R. 727, at para. 32). The importance of preventing unnecessary applications for production from consuming scarce judicial resources cannot be overstated; however, the undue protraction of criminal proceedings remains a pressing concern, more than a decade after *O’Connor*. On the other hand, the relevance threshold should not, and indeed cannot, be an onerous test to meet because accused persons cannot be required, as a condition to accessing information that may assist in making full answer and defence, “to demonstrate the specific use to which they might put information which they have not even seen” (*O’Connor*, at para. 25, quoting from *R. v. Durette*, 1994 CanLII 123 (S.C.C.), [1994] 1 S.C.R. 469, at p. 499).

This is the source of the judicial mind-set against applications to engage in, “highly speculative fishing expeditions,” that dominates the case law quotations of and references to para. 32 in *Chaplin*:

Apart from its practical necessity in advancing the debate to which I refer above, the requirement that the defence provide a basis for its demand for further production serves to preclude speculative, fanciful, disruptive, unmeritorious, obstructive and time-consuming disclosure requests. In cases involving wiretaps, such as this appeal, this is particularly important. Fishing expeditions and conjecture must be separated from legitimate requests for disclosure. . . .

[See for example, *R. v. Mamouni* 2017 ABCA 347, at para. 44.]
the error rates of their software source code, and the quality of their records management.

6. Continuing professional development (formerly called, “CLE”) seminars, conference, etc., don’t provide sufficient information about technology.

7. This problem of making sufficient knowledge of technology available to counsel is a moving target, i.e., technology is constantly and rapidly changing and therefore so will the types of technology that produce the most frequently used kinds of evidence; therefore, law school courses and CPD/CLE conferences and materials can never by themselves be a sufficient source for such information;

8. In addition, there is the unaffordable legal services problem. Only rich and institutional clients can pay for the experts who will educate their lawyers as to the technology that produces the evidence, and be expert witnesses if required. This “access to justice problem” results in an ever-increasing number of persons appearing in courts, particularly criminal courts, without lawyers, thus greatly increasing the probability of wrongful convictions and wrongful guilty pleas—such unrepresented persons can’t challenge the complex sources of the evidence used against them.

9. Prosecutors don’t know such technology either, and therefore can’t inform investigating police officers what to watch out for and obtain, and what exactly disclosure to defence counsel should include as

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11 See by Ken Chasse: (1) “Electronic Records as Evidence” (SSRN, February 19, 2018); (2) “Records Management Law—a Necessary Major Field of the Practice of Law” (SSRN, 2015), 13 C.J.L.T. 57-100 (online: <https://ssrn.com/abstract=2723629>), Section 1: “The Serious Defects Caused by the Inadequate Legal Infrastructure Controlling the Use of Electronic Records as Evidence” (pp. 58-62); and, (3) “The Records Management Lawyer—A Specialist in a Necessary Major Field of the Practice of Law” (SSRN, September 8, 2014). See also infra the text accompanying note 43.

12 The access to justice—unaffordable legal services problem (the “A2J problem”) is caused by law societies and governments tacitly agreeing to fail to serve the justice system adequately. Governments: (1) fail to challenge the performance of law societies as to making legal services adequately available (i.e., competently provided, ethically provided, and affordably provided, as required, for example, by Ontario’s Law Society Act, s. 4.2) so as to make law societies accountable to the political-democratic process; and, (2) governments do not provide sufficient resources for the justice system to operate adequately (e.g., there are never enough courts, judges, prosecutors, and Legal Aid funding); see: Ken Chasse, “No Votes in Justice Means More Wrongful Convictions” (SSRN, June 10, 2016, pdf.). And law societies fail to try to solve the A2J problem, which is now devastating all major institutions of the justice system; see: Ken Chasse, “Access to Justice—Unaffordable Legal Services’ Concepts and Solutions” (SSRN, June 7, 2018, pdf.), 153 pages; and, Ken Chasse, “Law Society Accountability for the Access to Justice Problem,” (SSRN, December 21, 2018, pdf.), 30 pages, online: [https://ssrn.com/abstract=3291699](https://ssrn.com/abstract=3291699).

An attack upon this tacit agreement based upon the Canadian Charter of Rights and Freedoms is hindered by courts’ concerns as to “trenching upon” the authority of the other two branches of government, i.e., violating the “separation of powers doctrine.” See for example, B.C.A.G. v. Christie 2007 SCC 21, [2007] 1 SCR 873, and its voluminous progeny. In Christie the Court concluded unanimously (para. 27): “We conclude that the text of the Constitution, the jurisprudence and the historical understanding of the rule of law do not foreclose the possibility that a right to counsel may be recognized in specific and varied situations. But at the same time, they do not support the conclusion that there is a general constitutional right to counsel in proceedings before courts and tribunals dealing with rights and obligations.”
to the nature, vulnerability, and proper manufacturing, usage, and maintenance of the technology involved.\(^\text{13}\) Such information is necessary because the more complex a technology, the more ways there are for it to fail or otherwise perform inadequately.

10. The police aren’t yet routinely trained about such technical sources, such that what the prosecutor’s duty to disclose to the accused, being “the fruits of the investigation”,\(^\text{14}\) may be very inadequate; but defence and prosecuting Crown counsel “do not know what they do not know” as to what they should know about technology—that was a big problem in the recent Oland murder case.\(^\text{15}\)

11. Because most of the evidence used in both criminal and civil proceedings now comes from the same sources, many of the rules that now burden electronic discovery in civil proceedings, should apply to disclosure in criminal proceedings, but so far, they don’t.\(^\text{16}\)

12. Lawyers and police officers don’t know about the National Standard of Canada, *Electronic Records As Documentary Evidence* CAN/CGSB-72.34-2017;\(^\text{17}\) (or the comparable, U.S., Department of Defence’s

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\(^\text{14}\) Such “disclosure duty” was first established by the Supreme Court of Canada in, *R. v. Stinchcomb 1991 CanLII 45* (SCC, November 7, 1991), which has produced a huge volume of case law refinement and other legal literature. See, *R. v. Gubbins and Vailentgoed, 2018 SCC 44*, which held that breathalyzer maintenance records are third party records, therefore the accused can obtain them only by way of an *O’Connor* application (R. v. O’Connor 1995 CanLII 51, [1995] 4 S.C.R. 411). See also infra note 90 and accompanying text.

\(^\text{15}\) Supra note 6. In a pre-trial admissibility voir dire, defence counsel quite rightfully complained that there was, “no evidence of the proper operation of the computer system at the time of data collection,” and that, “we do not know what we do not know,” and that, “it is fallacious to assume a computer system always operates properly.” The Crown prosecutor was not required to call as witnesses the computer engineers and technicians who could have been cross-examined as to the nature of the technology involved, its maintenance, and history of performance; see, *R. v. Oland 2015 NBQB 245*, at paras. 35, 60, and 64. Therefore, it can be argued that the law allowed the onus of proof to provide “evidence to the contrary,” to be transferred too early and unfairly.


\(^\text{17}\) To download a copy of this national standard, online: <https://www.techstreet.com/cgsb/searches/18423558>. But it has errors that plagued its creation as well as its content; see: Ken Chasse, “Innovation Canada, IP, and Dependence Upon the Standards Council of Canada” (SSRN, February 2, 2018, pdf.), online: <https://ssrn.com/abstract=3107800>. The contents of this national standard are summarized in Appendix A of, Ken Chasse, “Electronic Records as Evidence” (SSRN, February 19, 2018, pdf.), online: <https://ssrn.com/abstract=2438350>; and at the Canadian
5015.2 standard for records management) that establishes the required practices and procedures for the proper operation of such technology as electronic records management systems technology; electronically-produced records now being the most frequently used kind of evidence.

13. If the nature and quality of the manufacturing, use, and maintenance of the technology that produces the prosecution’s evidence are not known, at a preliminary inquiry, defence counsel cannot specify whether “committal for trial is in issue,” or which issues are to be dealt with, and which witnesses are requested to be heard (Criminal Code ss. 535-536.5). Bill C-75 (as passed by House of Commons, December 3, 2018, and now in the Senate (as of March 18, 2019)), will limit the preliminary inquiry to offences wherein life imprisonment is a possible sentence. The reasons given are: (1) that the Stinchcombe 1991 CanLII 45 (SCC), disclosure requirement upon the Crown can satisfy the same purposes; and, (2) the preliminary inquiry is not used with sufficient frequency to justify its continued existence. But because of the lack of knowledge of police and Crown counsel of the technology that produces most of the evidence, such adequate disclosure is very unlikely. And lack of knowledge of technology by all counsel is a large contributor to the under-usage of the preliminary inquiry.

14. Specialized, high volume production, support services methods of production (as provided by the infrastructure by which medical services are provided, and by the “parts industry” for automobile manufacturers) are the necessary solution for both the problems of the unaffordability of legal services, and for providing all lawyers, at cost, with the necessary technical information with which to cope with the technical sources of evidence. But, due to law societies’ management structure being entirely dependent upon the expertise of practising lawyers (benchers), law societies lack the necessary expertise and the willingness to deal with such problems because they are not legal problems. They are problems concerning the economics of different methods of producing goods and services. But law societies don’t go out and retain the necessary expertise. Therefore, such problems grow worse because law societies are like an elected government without a civil service. Such a government cannot govern. And neither can law societies in regard to such problems as the affordability of legal services and the necessary information by which to challenge the sources of the most frequently used kinds of evidence.

15. The major institutions of the justice system do not operate as an integrated system of the mutually interdependent parts; those parts being: law societies; governments; the court system; the legal profession itself; law schools; and, those agencies that produce goods and services for the justice system, such as, Crown prosecutors, the police, and the production of national standards by the Standards Council of Canada and the related standards development agencies that sponsor the drafting of such standards such as the

Canadian General Standards Board, which the Standards Council declares to be National Standards of Canada. As a result:

1. governments: (a) under-fund the justice system because it is believed that “there are no votes in justice,” i.e., there are no significant quantities of votes to be gained by spending significant quantities of taxpayers’ money on the justice system, and, (b) do not challenge the performance of law societies so as to make them accountable in fact (as distinguished from “in law”), to the political-democratic process, which accountability would have forced them to evolve (as has everything else), beyond the 19th century management structure by which they still operate;

2. law societies do not: (a) provide adequate means by which lawyers can maintain competence as to their knowledge of technology; (b) sponsor the innovations that would enable lawyers to produce affordable legal services for middle and lower income people, i.e., for the majority of society; and, (c) evolve beyond their, 19th century management structure, institutional culture, and their resulting reputation as being very conservative institutions that resist change to their management structure and their accountability for the existence of the unaffordable legal services problem;

3. judges and courts are: (a) much concerned about the increasing time and cost of legal proceedings, which has motivated a strategy of limiting the issues to be decided such that the reliability of the technically complex sources of commonly used types of evidence is not adequately challenged; and, (b) overwhelmed with self-represented litigants (because they cannot afford lawyers), causing judges to warn that their courts are “grinding to a halt”;

4. law schools: (a) in their evidence courses do not adequately deal with the consequences of such technology as to its necessary impact upon the rules of evidence and procedure; and, (b) the writings of their law professors appear to accept the very obsolete management structure of law societies and their resulting very poor performance, all without significant criticism;

5. the standards development organizations (SDOs) that produce standards, (such as the national standard for electronic records management systems, Electronic Records As Documentary Evidence CAN/CGSB-72.34-2017, declared by the Standards Council of Canada on March 1, 2017 to be a National Standard of Canada)—which systems produce the most frequently used kinds of evidence in legal proceedings, i.e. records—lack sufficient quality control procedures and accountability for their performance to the Standards Council.

If its major problems are to be lessened, if not solved, these institutional parts of the justice system must be made to work as a highly integrated and mutually-interdependent whole. Instead, each operates separately to serve its own interests, and so each contributes to the cause of each major problem, or is its victim.

Therefore, due to the under-performance of major institutions of the justice system as set out in the above listed 15 categories of problems: (1) lawyers lack the knowledge to challenge the reliability of technical sources of frequently used kinds of evidence; and, (2) there is toleration of the negative impact of that lack of knowledge upon the ability “to do justice.” As a result, law and practice and the attitudes that support them in relation to the impact of technology upon the law of evidence, are moving in one direction,
but the reality of the main sources of evidence is moving in the opposite direction.

2. CENTRALIZED LEGAL RESEARCH SUPPORT SERVICES ARE NECESSARY

Centralized legal research support services are needed now because of: (1) the great volume of laws; (2) the complexity of laws; (3) laws increasingly based upon technology that has to be understood; (4) the speed with which laws and technology change; and, (5) complex electronic systems and devices produce most of the evidence used in legal proceedings and for legal services. All lawyers should see themselves similarly afflicted with these facts because such sources of evidence apply to the evidence used for legal services as well as for legal proceedings. These factors should require legal research to be done by lawyers who specialize in doing legal research as a career. That is to say, legal research done by specialist lawyers serving other lawyers. Lawyers and judges should no longer be depending upon the legal research done by law students, paralegals and persons with a law degree but no further training or experience in the law. The law’s volume, complexity, increasing interdependence with technology, and the speed with it changes, as stated and analyzed in a very voluminous body of legal literature, require legal research specialists. Legal research is at the foundation of what lawyers and judges do—give legal advice and interpret and apply the law. Because electronic technology is greatly and rapidly increasing that volume and complexity of legal literature, no longer should legal research done by the legal profession’s least qualified workers be accepted as an adequate way of doing it.

“Centralized legal research” (CLR) means legal opinions and other products of legal research produced for lawyers, by means of support services. “Support services” methods of production are used because they are the way to produce the large economies-of-scale necessary to produce goods and services that are affordable by middle- and lower-income people, *i.e.* for the majority of society. A true support service has these two essential features: (1) a high degree of specialization of every factor of production; and, (2) a high volume of production. The second factor produces the large revenues that finance the first factor. It is a strategy of “cutting costs by increasing competence.” In contrast, when law firms have their legal research done by law students, paralegals, and their most inexperienced lawyers, they use a strategy of “cutting costs by decreasing competence.” This second strategy has a comparatively small impact upon the costs of production.

The “support services method of production” produces large cost-savings because it takes advantage of the fact that in any manufacturing situation, not all of the costs of production vary in proportion with the volume produced. Therefore, the more that is produced, the smaller the share of total costs does each unit produced have to pay for. Or, “nothing is as effective at cutting costs as scaling-up the volume of production.” “Bigger is better,” which is why commercial producers wish to become large producers—their profit margins go up as their costs go down. That is why there is a “parts industry” that produces large
economies-of-scale for the manufacturers of automobiles, and why no doctor’s office provides all treatments and all remedies for all patients as does a lawyer’s office try to do for all clients. The client gets the benefit of only the internal resources of the law firm. But the patient gets the benefit of all of the services and specialists within the whole infrastructure of the medical services industry staffed by medical doctors and technicians, etc.

Technology has created an additional reason for CLR. Knowledge of the electronic systems and devices that produce most of the evidence now used in legal proceedings is necessary for challenging their ability to produce reliable evidence, e.g., to be able to cross-examine a records manager as to the ability of a particular electronic records management system to preserve all of the relevant records that it contained without loss or destruction or the corrupting of their data, and preserve them in the original form. Specialist legal research lawyers are needed to provide information as to how to challenge those technologies that produce the more commonly used types of evidence—evidence such as the four types listed above in the first paragraph of this article. They are necessary if counsel is to be able, not only to conduct adequate cross-examinations of technical and expert witnesses, but also to argue why it is that the rules of procedure that govern proceedings such as discovery, voir dires dealing with the admissibility of evidence, and preliminary inquiries, must be made to vary with the nature of the technology that produces the evidence. Such cross-examinations and arguments are not possible without sufficient knowledge of the technology involved. How can it be made available cost-efficiently and affordably for all cases that require it and for all lawyers who should have it?

LAO LAW at Legal Aid Ontario (LAO) in Toronto is a CLR support service. Its CLR technology produces legal opinions for lawyers in private practice who service Legal Aid cases. It involves highly specializing these three major factors of production: (1) the legal research staff; (2) the internal materials created and used to create legal opinions; and, (3) the principles of database management. The research staff is composed of career legal research lawyers, each specializing in a single major area of law for which LAO grants government-financed legal assistance. Criminal law and family law problems constitute the majority of such publically financed legal services.

The specialized materials developed are specialized databases of standardized memoranda, factums, and other materials with which legal opinions are created. The memoranda deal with individual issues of law and fact, referred to as “standard memoranda.” Groups of standard memoranda are kept up-to-date by assigning such work to the researchers according to their area of specialization.

A legal opinion is created by way of: (1) a selection of such standard memoranda relevant to the issues in the requesting lawyer’s client’s fact-pattern; and, (2) accompanied by an individually written memorandum that uses references to the standard memoranda to create a legal opinion for the fact-pattern submitted by the lawyer servicing the client. It is “custom made” to serve the issues of fact and law in the
fact-pattern. And, lawyers in private practice who do Legal Aid cases can themselves go online to LAO LAW to download one or more of thousands of such standard memoranda and factums for their Legal Aid cases. In such a CLR unit, the internally developed legal materials quickly become more important to its production method than are the materials obtained from law book companies and other external sources.

The main principles of database management are: (1) capture all finished work-product for re-use; (2) index in detail all finished work-product for quick and accurate retrieval; and, (3) purge the database of superseded opinions—superseded because they have been re-used to create new opinions that have the same content. Thus, the database of legal opinions stays lean so as to prevent researchers having to read repetitive material. That could seriously reduce the cost-efficiency of production. Large economies-of-scale are obtained by a high rate of re-use of finished work-product, which greatly lowers the costs of production. The greater the degree of re-use, the greater are the economies-of-scale achieved. And the greater the volume of production, the greater is the incidence of re-use. And so new legal opinions are created by a high volume of re-use of previously created legal opinions, which greatly lowers the cost of each legal opinion produced. And other services for lawyers who do Legal Aid cases have been developed from these databases of legal opinions, standard memoranda, and factums. The cost-efficiency with which such functions are performed is highly dependent upon the high degree of specialization of the research staff. And lawyers working at such a high degree of specialization are not affordable without a high volume of production. And the profit and cost-saving produced is highly dependent upon the volume of finished work-product. Traditional methods of doing legal research cannot match such a “support services” method as measured by competence, quality, quality-control procedures, volume of production, response time, safety, and profitability.

The principle that “nothing is as affective at cutting costs as scaling-up the volume of production” should be made applicable to legal research. But to have both volume and high-quality production requires a high degree of specialization of each major factor of production. Such a “support-serves” method of production makes possible the best possible response time and the safest method of production. In contrast, using the law office’s least qualified people, produces a comparatively small cost-saving, and, because of their lack of experience, a poorer response time and a less error-free and therefore a less safe method of production. The support-services method of production lowers costs by increasing competence. Using the least qualified people uses the opposite strategy—lowering costs by decreasing competence.

No longer should legal research be thought of as a part of a lawyer’s work that cannot itself be made profitable and therefore justifiably done by a law office’s least qualified people. The volume and complexity of law, et cetera, has made the traditional method of research, (which is still used by the majority of law offices), very obsolete. So, what are law societies doing to sponsor and bring about that necessary transition? That issue should be seen as part of a law society’s duty to maintain the competence of lawyers
and the affordability of their legal services.

I started LAO LAW on Tuesday, July 3, 1979. It was created in response to government auditors’ complaints that LAO was paying out far too much money on lawyers’ accounts for legal research hours claimed. That pressure is why such an innovation occurred in the most poorly financed institution in the legal profession. Why didn’t it happen in a big law firm—because, no pressure; no innovation. Similarly, law societies have not evolved from their 19th century management structure, institutional culture, and mentality because governments have not applied the pressure that should provide the necessary accountability for the exercise of powers granted by law that would make them evolve by innovation.

And so, by its ninth year of development, 1988, LAO LAW was producing legal opinions at the rate of 5,000 per year. It achieved that volume of production because it helped lawyers make money and serve their clients better. However, because of cuts to LAO’s funding over the intervening years, LAO LAW’s services and functioning are somewhat different now than they were during its first nine years. And LAO LAW is not a commercial service. It is subject to the political decisions and the funding provided by elected governments. But it is an example that shows why all of the manufacturing of goods and services has moved away from the “cottage industry” method of production that is still used by the legal profession, to “support services” methods of production. Otherwise, the production of affordable goods and services for middle and lower income people is not possible. Automobiles would be unaffordable to middle- and lower-income people if they were still made as originally made, instead of now being manufactured by way a sophisticated support services method. Lawyers have not made that transition from cottage industry to support services method, therefore only their simple, routine legal services are affordable to the majority of society. But law societies act as though “affordability” for the majority of society is not their problem to solve. So, whose duty is it to solve? An adequate solution by government would be socialized law, which is a method of producing legal services that law societies fear and hate.

But law society benchers18 (lawyer-managers), don’t know or think about such things as the economics of different methods of production even though studying variations in the production of legal services would make their law firms more profitable. And therefore, they wouldn’t think of establishing support services for the production of legal services. As a result, it is well established that, there are no economies-of-scale in the practice of law.19

18 Definition of “bencher”: see infra note 27.

19 As to the use of support services and my experience in developing CLR as a support services method of doing legal research, see these articles that I’ve written: (1) “Access to Justice—Unaffordable Legal Services’ Concepts and Solutions” (SSRN, November 8, 2018, pdf.) 153 pages, online: <https://ssrn.com/abstract=2811627>;
(3) “Law Society Accountability for the Access to Justice Problem,” (SSRN, December 21, 2018, pdf.), 33 pages, online: <https://ssrn.com/abstract=3291699> and,
That is the cause of the unaffordable legal services problem. It prevents middle, and lower income people from having affordable legal services that are more than just simple, routine legal services. But they are the majority of: (1) the population; (2) taxpayers; and, (3) voters. Therefore, law societies should be more concerned about their political vulnerability.

We cannot escape the fact that most of the evidence now used in legal proceedings and services now comes from complex electronic systems and devices. But, to make sufficient knowledge of such technology available to all lawyers, requires the creation of specialist legal research lawyers who have such knowledge to provide to other lawyers, particularly general practitioners. Otherwise, lawyers must continue to be unable to challenge electronic systems’ and devices’ alleged ability to produce reliable evidence. In contrast, family doctor and specialist doctors have available to them a vast range of highly specialized doctors, technicians, and hospital services. But the legal profession has no counterpart. Without the creation of specialized legal research lawyers, the legal profession will not have the ability to challenge the performance and reliability of an ever-changing world of complex technology that produces evidence. Rich clients who can afford to provide the experts that can educate their lawyers will be an exception. But the majority of society can’t afford that. And so, there is one law for the rich and quite a different one for the poor and middle-income people. Is there no institution of the justice system responsible and accountable for that state of Canada’s justice system?

3. EDUCATING LAWYERS AND LAW STUDENTS ABOUT TECHNOLOGY

Is it to be law schools or law societies, or both, and if both, where and what is the dividing line in responsibility for providing such educating as to technology? Law schools cannot teach the nature and details and requirements of all technologies, present and future. They can make students aware that laws of procedure and evidence should be flexibly applied so as to be compatible with the nature of the technology that produces the evidence that is the subject matter of the particular legal proceeding, e.g., in a voir dire dealing with the admissibility of evidence, issues such as, (1) what constitutes sufficient “circumstantial guarantees of reliability”; (2) what is the nature of the evidence that the adducing party must present and by way of which type of witnesses; (3) at what point should the onus of proof be transferred to the opposing party to present “evidence to the contrary”; and, (4) in what ways should the difficulty and expense of providing such “evidence to the contrary” impact the decisions made in regard to the first three issues? If the nature of the technology is not considered when deciding these issues, a defendant may be deprived of an adequate opportunity to make “full answer and defense” at trial because, in regard to the admissibility

(4) “The SCC and Lawyers Need Better Researchers Than ‘Clerking’ and Law Students” (Slaw, February 1, 2016); online: <http://www.slaw.ca/2016/02/01/the-scc-and-lawyers-need-better-researchers-than-clerking-and-law-students/>.
of critically important evidence the onus of proof applied to the adducing party was too light, and that put upon the opposing party was too heavy. That was so due to the nature of the technology that produced the mobile phone tracking evidence at issue in the pre-trial voir dires in the Oland murder case: R. v. Oland 2015 NBQB 245, and, R. v. Oland 2015 NBQB 244 (to be read in that order). The trial judge wasn’t wrong, but rather the case law and other authorities he applied were inadequate because they did not take account of the nature of the complex technology that was the source of that evidence. Rules and practices of procedure cannot be applied to electronically-produced evidence in the simplistic way in which they have been applied in relation to evidence produced by mechanical systems and devices.

When law students become lawyers, they should be able to argue such issues as to the need that the application of the rules of procedure and evidence that govern discovery, disclosure, and admissibility proceedings, and preliminary inquiries, and the application of presumptions and inferences, and even the burden of proof at trial should be made to vary with the nature of the technology that produces the evidence dealt with in such proceedings. That is the nature of the refinement of such rules that the electronic era of electronic systems and devices requires. But in turn, such refinements require that counsel have sufficient knowledge of that technology so as to be able to: (1) make persuasive arguments as to how various technical sources of evidence should impact the application of rules of procedure and evidence; (2) adduce such evidence in a manner that adequately reveals its evidentiary value and powers of persuasion, and, (3) conduct adequate and knowledgeable cross-examinations of the witnesses who present such evidence. Such knowledge of technology is also necessary to present arguments as to whether the burden of proof in civil cases—"proof on a balance of probabilities”—and the burden of proof in criminal cases—"proof beyond a reasonable doubt”—have or have not been satisfied.

But, how to make such necessary knowledge of technology available to all lawyers involved in legal proceedings and who provide legal services? That question presents a major problem because most of the evidence used in legal proceedings and for legal services now comes from complex electronic systems and devices. For example, records are now the most frequently used kind of evidence used in legal proceedings and for legal services, and almost all of them come from complex electronic records management systems (ERMSs). If such systems are not well maintained one cannot be sure that they can produce all relevant records that they once contained. That fact should require one to ask, what is the probability of an ERMS losing, destroying and corrupting the data in records, and being able to present records in their original form?

And so, professors of the law of evidence should be able to devise a course that deals with these issues:

- What and how much evidence should the party adducing the evidence in an “admissibility of evidence”

voir dire, have to provide to cause the onus of proof to be transferred to the opposing party to adduce “evidence to the contrary”?

- And shouldn’t the nature and vulnerabilities of each different technology-based source of evidence be argued, and be judicially judged as to how fair and possible it is to produce such “evidence to the contrary”?

- What kinds of witnesses does the adducing party have to use, i.e., do they have to be those who know the nature, vulnerabilities, and performance of such technology-based sources, or merely security employees, as were the Crown prosecutor’s witnesses in the pre-trial voir dires in preparation for the second degree murder trial in, R. v. Oland 2015 NBQB 245, and, 2015 NBQB 244? Security people don’t know the technology or its performance, so can’t be cross-examined about such things. So, should Crown or plaintiff be required to call such knowledgeable witnesses to adduce such evidence instead of just security people?

- When applying to have access to the technology for testing by experts, what evidence should have to be adduced to get that court-ordered access?

- What of the very strong, deeply entrenched Supreme Court of Canada bias against applications for further disclosure so as, “to preclude speculative, fanciful, disruptive, unmeritorious, obstructive and time-consuming disclosure requests”?

- And given that poorly maintained electronic records management systems (ERMSs) have an increased probability of losing, destroying, corrupting records, there should be a requirement that information as to the state of records management be exchanged between the parties in discovery proceedings, and as part of disclosure of “the fruits of the investigation” in criminal proceedings (as required by R. v. Stinchcombe 1991 CanLII 45 (SCC), and its voluminous progeny. And, the balancing “proportionality” function established by Principle 2 of the Sedona Canada Principles 2d (2015), for electronic discovery in civil proceedings, should be made available in criminal proceedings. In relation to requests for further disclosure, it provides a process of weighing claims of disproportionality of the cost of satisfying such requests against the need for and worth of such further disclosure. As to the high incidence of poorly managed electronic records management systems (ERMSs), see: Ken Chasse, Electronic Records as Evidence” (SSRN, February 19, 2018, pdf.).

- And given that such evidence used in all proceedings comes from the same sources, shouldn’t the rules and issues applicable to electronic discovery in civil proceedings have their counterparts in criminal proceedings? And, there are now senior lawyers who are designated as being e-discovery specialists, who use TAR devices (technology assisted review devices) to find the relevant records in large collections of records, but they work only in civil litigation.

- Section 30 of the Canada Evidence Act should be argued and interpreted so as to require such “quality of records management information” as being a part of a party’s, or third party’s “usual and ordinary course of business” in regard to its quality of electronic records management. And the “integrity of the ERMS” concept established s. 31.2(1)(a) of the Canada Evidence Act, should be applied so as to require proof of

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21 The sentencing decision is at, 2016 NBQB 43; and the New Brunswick Court of Appeal decision that lead to the non-jury re-trial is at, 2016 NBCA 58. And the refusal of the Supreme Court of Canada to grant leave to appeal is at, 2017 CanLII 44310 (SCC). The re-trial was adjourned to May 9, 2019, when counsel provided their closing arguments, and trial judge’s decision was not expected until mid-June, 2019, or later (Canadian Press).

22 See supra notes 9 and 13 and accompanying texts.

23 See, Ken Chasse, “Electronic Discovery’s ‘Records Review Stage’ Software Programs” (SSRN, October 1, 2018, pdf.), 20 pages, online: <https://ssrn.com/abstract=3249484>. An example of such an e-discovery specialist lawyer is Martin Felsky, Ph.D., J.D., member of the Law Society of Ontario, Vice President, Electronic Discovery and Information Governance, Forensic & Integrity Services at Ernst & Young LLP, Toronto, and formerly, National e-Discovery Counsel at Borden Ladner Gervais in Toronto.
such “integrity,” and similarly applied by its provincial and territorial Evidence Acts counterparts.

The Law Society of Ontario has a Technology Guideline that specifies the types of applications of technology that its lawyer-members should know. But it doesn’t deal with competence to challenge the reliability of technical sources of frequently used kinds of evidence. Its “Introduction” paragraph shows that it is limited to subjects concerning practice management:

The Technology Guideline outlines the circumstances in which the use of information technology is mandatory, as in the case of electronic registration. It also outlines the circumstances when information technologies are recommended. The Guideline invites the practitioner to consider the use of technologies to support client service expectations and practice management and reminds lawyers to address concerns respecting security, disaster management and technological obsolescence.

Here is an example of knowledge needed to challenge the reliability of technology that produces very commonly used and critically important evidence. In, R. v. Oland, 2016 NBQB 43, there was a conviction for second degree murder based upon the evidence produced by mobile phone tracking, i.e., evidence as to the location of the accused at the time of a critically important call to the mobile phone in his possession. Such evidence involves three technologies: (1) that which makes available such communication service between mobile phones; (2) the large, complex ERMS that contains the data as to each call, and most often contains it for many months at the mercy of the ERMS’s operating system’s thousands of functions and movements that it is subjected to before that data is downloaded to be used as evidence; and, (3) the expert opinion evidence that is based upon that data, as to where the phone was at the time of the call.24

How to provide defence counsel with enough technical knowledge to challenge the reliability of such data and opinion evidence if the accused cannot afford to retain an expert who can educate his lawyer? A person has to be very poor to qualify for Legal Aid. And would Legal Aid pay for such an expert witness if the offences charged were less than murder, or for a plaintiff or defendant in any civil proceedings, if there were important “public interest” issues involved?25 Where should the dividing line be between, the

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24 To understand the usage of mobile phone tracking evidence, begin with these decisions: R. v. Cyr, 2012 ONCA 919 (paras. 86-128); R. v. Hamilton, 2011 ONCA 399 (para. 230 & following); and, R. v. Ranger, 2010 ONCA 759 (paras. 13-18). They are the most frequently cited appeal court decisions. There were two pre-trial voir dires in the Oland case that dealt with the admissibility of the mobile phone tracking evidence (to be read in this order): R. v. Oland 2015 NBQB 245, and, 2015 NBQB 244.

25 In R. v. Moodie 2016 ONSC 3469, Norheimer J. (now a Justice of the Court of Appeal for Ontario), dealing with an application for state-funded counsel by way of a “Rowbotham order,” [see: R. v. Rowbotham, 1988 CanLII 147 (ON CA)] pointed out that Legal Aid Ontario’s yearly income cutoff level to qualify for Legal Aid assistance was significantly below the federal government’s poverty line. Norheimer J. applied this statement from paragraph 24 of, R. v. Rushlow, 2009 ONCA 461 (CanLII), “The authorities hold that the case must be of some complexity, but a requirement of unique challenges puts the threshold too high. It is enough that there is a probability of imprisonment and that the case is sufficiently complex that counsel is essential to ensure that the accused receives a fair trial.” See
law of technology for the rich, versus such law for that majority of society who now cannot afford legal services beyond very simple, routine legal services?

Law books, as written by lawyers, prepare counsel to test witnesses in regard to the points made in the case law. But the case law process of *stare decisis*, precedent-directed development of the law, still perpetuates its lack of detailed knowledge of the technologies that now produce most of the evidence. The books that lawyers read don’t yet provide sufficient in-depth discussions of technology to prepare counsel to: (1) conduct a sufficiently challenging cross-examination of the reliability of such sources of evidence; and, (2) present arguments as to why the rules of procedure and evidence that control the use of evidence must be applied flexibly so as to be compatible with the nature of each different technology that is the source of the evidence being considered.


> Digital evidence used to sound like a cutting-edge topic. Now, every case in every level of criminal court in Canada is likely to have a digital component. Facebook posts, Twitter feeds, SMS messages, and email strings are the fodder of everyday relationships and, therefore, have become everyday criminal evidence.

This is important recognition of the pervasiveness of digitally-produced evidence. But, although what follows is a good review of the available “legal materials,” it does so with inadequate reference to the nature and the evidentiary specifics of the technology involved. The same can still be said of the content of law school courses on evidence and continuing professional development seminars and conferences. The weakness of teaching only by “case law development” is that it perpetuates only what case law knows. We have to get into the technical literature, which warns *inter alia*, that we trust software far too much because it’s full of errors—see Sections 7 and 8 below.

Law societies impose continuing professional development (CPD/CLE) yearly hours or credits requirements upon lawyers to maintain competence. But so far, the necessary detailed information about technology isn’t provided in such seminars and conferences. Should that duty be left entirely to law schools? Law societies have a power of approval over law school *curricula* so as to ensure that students have sufficient education to be candidates for licensing and their “call to the Bar.” The more that law society benchers27 (their elected lawyer-managers) can require of law school education, the smaller and simpler is


[27] “Benchers”-Canadian usage: the terms *bencher* and *treasurer* are in use by the *legal profession in Canada*. A bencher in the Canadian context is a lawyer elected by the other lawyer-members of the law society to be its board of directors (referred to as “Convocation”). The treasurer is elected by the benchers to function as the chair.
the law society’s burden as to maintaining the legal profession’s competence. That could become an increasingly probable source of friction as technology produces more sources of frequently used evidence. However, law schools themselves produce CPD/CLE seminars and conferences, e.g., OHLS at York University is a large producer as well as an LL.M. extension course for practicing lawyers.

And so there is a detectable tone of annoyance as to law societies’ requiring law schools to produce “practice ready lawyers,” in Professor Emeritus Harry Arthurs’ article, The Future of Law School: Three Visions and a Prediction,” wherein he states:”

I begin with the widely-held view that law schools exist to produce practice ready lawyers. This view is clearly held by the Federation of Law Societies of Canada (FLSC) and its member bodies which recently — for the first time ever, but without stated rationale or clear legal authority — decreed that law schools must ensure that all their graduates are ready to practice. Unfortunately, producing practice ready lawyers is something law schools cannot do. The problem is that no one knows what practice ready lawyers look like. We lack information about what legal practitioners do, what knowledge or competencies they actually need or use, what breadth and depth of knowledge qualify new graduates as “ready” to practice, or how long they will remain “ready” before what they learned at law school becomes obsolete. These are empirical questions. However, they were neither asked nor answered before the law societies adopted their new regulations. (To its credit, the FLSC has attempted to subsequently validate its earlier conclusions by conducting a survey of the tasks performed and knowledge used by recent graduates; unfortunately, the survey suffers from very serious methodological shortcomings.) [footnotes omitted]

And in the following two paragraphs he concludes (p. 716):

V. CONCLUSION

The future of law schools is uncertain: the social, political, and intellectual forces that shape law, legal practice, and legal education are in flux. Their future is contested; the academy and the profession are fundamentally at odds over the nature of knowledge, the best way to educate lawyers, and many other matters. And their future is plural: different law schools will have different futures. Nonetheless, I will venture a prediction. When this law school celebrates its bicentenary in 2113, when speakers look back on its second century of accomplishment, they will mention distinguished scholarship more often than skills training, they will mention its long-term contributions to the public good more often than its immediate influence on present-day legal practice, and they will mention its role as an agent of change more often than its role as a faithful purveyor of conventional wisdom. [footnote omitted]

Taking the long view and focusing on change will seem like typical academic self-indulgence to those whose job it is to ensure that the public receives high quality professional services in the here and now. Describing law schools as multifunctional knowledge communities rather than institutions single-mindedly devoted to the training of practice ready lawyers will seem like callous indifference to the plight of students and

Paralegals are also elected as benchers in those provinces where the law societies govern the paralegal profession.


29 Ibid. at 716.
recent graduates who face mounting debts and declining job opportunities. And my apparent downgrading of “hard law” and “how to” courses, and my privileging of theory and thinking, of interdisciplinarity and contextualization, will appall at least a few of my academic colleagues. To all of the above I apologize if, as they say, I have inadvertently given offence. But I am willing to bet that when the time capsule is opened 100 years hence, when someone removes the crumbling copy of my remarks and matches them against the historical record, I will turn out to have been right. And not only right, but helpful to those charged with upholding professional standards, prescient in my advice as to what kind of education will help students survive and flourish in volatile legal labour markets, and so modest in my prescriptions for reforming the law curriculum as to seem hopelessly conservative to my academic heirs and assigns.

This issue as to the division of responsibility for lawyers’ education and competence becomes increasingly important, difficult, and therefore contentious, as technology adds greater complexity and therefore vulnerability to the sources of evidence, and to the speed with which those sources evolve and change, and to the laws, regulations, and national and international standards that regulate the manufacture, use, and, maintenance of such technology. The systems for lawyers’ education and maintaining competence are not ready for that. But law schools have a much greater willingness to innovate by which to serve the future of the legal profession than do law societies, which are very conservative institutions because their bencher-managers are practicing lawyers with little time to be benchers, and therefore avoid the unforeseen consequences that one must expect from substantial innovation, which therefore doesn’t happen. And so, it is that the access to justice problem (A2J problem) exists and worsens, but no law society in Canada has a program the purpose of which is to solve the problem as distinguished from “alternative legal services” programs that merely help the population learn to live with the problem.\textsuperscript{30} That is a serious failing of law societies and therefore of the justice system as a whole. The institutional parts of the justice system must be made to work as a highly integrated whole if its major problems are to be lessened, if not solved.

4. THE FACTORS AFFECTING THE RELATIONSHIP BETWEEN TECHNOLOGY AND PROCEDURAL RULES

While technology rapidly changes, procedural law, (such as the rules governing “electronic discovery” and “admissibility of evidence” proceedings), changes at a much slower pace. Such procedural rules are, for example, those that determine when a prosecutor in a criminal case or plaintiff in a civil case, has produced sufficient evidence of reliability in an, “admissibility of evidence proceeding” (\textit{a voir dire}), to cause “the onus of proof” to transfer to the accused or defendant to produce “evidence to the contrary.”

\textsuperscript{30} That the majority of the population, \textit{i.e.}, middle- and lower-income people, cannot afford legal services, except for very routine legal services, is now well established and broadly accepted by law societies, governments, and the legal profession itself. See: Ken Chasse, (1) “\textit{Access to Justice—Unaffordable Legal Services’ Concepts and Solutions}” (SSRN, November 8, 2018, pdf); and, (2) Ken Chasse, “\textit{Law Society Accountability for the Access to Justice Problem}” (SSRN, December 16, 2018, pdf), 26 pages. Typical “alternative legal services” programs are listed \textit{infra} in note 37.
Another example is the “proportionality principle” of electronic discovery (e-discovery) proceedings, in determining whether the “disproportionate cost” alleged in response to a demand for further production of records, should take into account the state of the opponent’s electronic records management, i.e., that the alleged “disproportionate cost” of making a further search for relevant records, may be due to the opponent’s own bad records management.

Procedural rules should be made to vary so as always to be able to provide: (1) a reasonable and constitutional onus and burden of proof; (2) an adequate opportunity to provide, “evidence to the contrary,” to make “full answer and defence”; and, (3) to obtain a “fair trial” as is required by ss. 7 and 11(d) of the Canadian Charter of Rights and Freedoms. Instead, this “slower and simpler evolution” of what procedural law should be and do is made almost mandatory by a very strong desire to limit the time and cost of legal proceedings, most proceedings now being beyond the financial ability of middle and lower income people.

The control strategy used is to limit the issues to be decided. But technology’s incessantly growing complexity and sophistication always increases the factors and steps involved in producing evidence. And so, the issues of fact and law to be considered must be expected to multiply accordingly. Society’s ever-increasing dependence upon technology of increased complexity to produce goods and services and conveniences of greater utility, complexity, and indispensability, and therefore produce evidence of greater complexity and indispensability, must increase the number and complexity of the procedural issues that should be acknowledged and decided in legal proceedings. As a result, limiting the issues to be decided is a strategy of, “cutting costs by cutting competence”—cutting the competence of the legal proceedings to do justice.

Therefore, procedural rules should be flexibly applied for differing sources of evidence. But in fact, they lack sufficient flexibility. As a result, limiting the issues to be decided is a cost-cutting strategy that increasingly diminishes the competence of legal proceedings to cope with technology’s ever-changing reality. If sources of evidence cannot be adequately challenged, conclusions as to the reliability of the evidence produced are a pretence, and a justice system that produces fair and adequate legal proceedings is an illusion.

For example, in spite of what the electronic records provisions of the Evidence Acts require as to proof of the “integrity” of electronic document management systems (e.g., s. 31.2(1)(a) of the Canada Evidence Act (CEA)), there is diligent neglect, if not strong resistance to dealing with issues of, “quality of records management and its national standards.”

An example of proof of such an “integrity” requirement is in s. 31.2(1)(a) CEA (and its is provincial and territorial counterparts—see Appendix B, “A List of Electronic Record and Business Record Provisions in the Evidence Acts and Electronic Commerce Act in Canada,” in, Ken Chasse, “Electronic Records as Documentary Evidence,” (SSRN, February 19, 2018, pdf.), online; and in Appendix B in, “The Admissibility of Electronic Business Records” (2010), 8 C.J.L.T. 105 at 177; and in Appendix B in, “Electronic Records for Evidence and Disclosure and
technology, it is an example that is very compatible with a, “limiting of time and costs imperative strategy.”

But there is a price to be paid in legal infrastructure when society moves to a more complex technology.

The additional complexity means that there will be more issues of fact and law, such that legal proceedings must take more time and cost more money. The necessary regulating legal infrastructure includes not only


If electronic records management systems (ERMSs) are not well maintained, they have a significant probability of losing and destroying records and data. For a list of “The very common defects found in electronic records management systems,” see supra the references in note 11.

An example of disregarding the meaning and purpose of the “integrity” requirement is provided by the most authoritative text in Canada concerning procedures for electronic discovery proceedings, The Sedona Canada Principles-Addressing Electronic Discovery 2d ed. (November 2015). It contains no requirement as to the pre-trial production among the parties of information concerning the state of records management. The importance of this text is shown by the Ontario Rules of Civil Procedure, Rule 29.1.03(4), which states: “In preparing the discovery plan, the parties shall consult and have regard to the document titled ‘the Sedona Canada Principles Addressing Electronic Discovery’ developed by and available from The Sedona Conference. O. Reg. 438/08, s.25.” The Sedona text is given equal respect in the case law of the other provinces, see for example: Gardner v. Viridis Energy Inc., 2014 BCSC 2014, at para 15; Dow Chemical Inc. v. Nova Chemicals Corp., 2015 ABQB 2, [2015] A.J. 7, at para 50 et seq; Liquor Barn Income Fund v. Mother, 2011 BCSC 618, at para 73, and, Dykeman v. Porohowski, 2010 BCCA 36, at para. 41; and, Velsoft Training Materials Inc. v. Global Courseware Inc., 2012 NSSC 295 at para 8.

The case law is equally undemanding as to information about the state of records management of the records systems’ sources of the records that are used as evidence. For example, the decision in, Zenex Enterprises Ltd. v. Pioneer Balloon Canada Ltd., 2012 ONSC 7243, [2012] O.J. No. 6082, in effect holds that the state of a party’s electronic records management system (ERMS) is irrelevant to electronic discovery proceedings. Specifically, it holds (para. 8) that the parties (plaintiffs and defendants) are not to demand to know how searches for relevant records were conducted, nor can they investigate parts of an opposing party’s ERMS, such as hard drives. This ignores the fact that the accessibility and storage of electronic records are essential parts of ERMS technology. Electronic discovery should not be assumed or held to produce fair and accurate results unless the quality of the parties’ electronic records management is known, particularly so the state of compliance with the National Standard of Canada for electronic records management, Electronic Records as Documentary Evidence CAN/CGSB-72.34-2017 (hereinafter, “72.34-2017”; pdf.). See infra note 33.

See also: Warman v. National Post Co., 2010 ONSC 3670, [2010] O.J. No. 3455, 103 O.R. (3d) 174 (Ont. S.C.-Master), specific directions given at paras. 166-181; Direct Energy Marketing Ltd. v. National Energy Corp., 2013 ONSC 4048, [2013] O.J. No. 4533; and, 1483660 Ontario Inc. (c.o.b. Plan IT Search) v. Beaudoin 2010 ONSC 6294, [2010] O.J. No. 5313 (Ont. S.C.-Master). However, in, Siemens Canada Limited v. Sapient Canada Inc., 2014 ONSC 2314 (CanLII), (discovery issues before Master D.E. Short), the following directions were given (para. 156): complete back-up tape restoration; the application of original search terms to all .pst files; de-duping against the documents already reviewed and/or produced; and, the “application of a relevancy definition for the purposes of manual review to take into account issues and problems with the progress of the Project in earlier years.” But no requirement was imposed as to production of information as to the state of records management. And there was no reference to the national standards for records management that were in effect at that time, see also infra note 15 and accompanying texts.

And, the Sedona text shows a lack of understanding of the importance of national standards such as 72.34, and of its relationship to proving “systems integrity” as is required by such electronic records provisions as: s. 34.1(5),(5.1) of the Ontario Evidence Act; ss. 23D of the Nova Scotia Evidence Act; and, s. 31.2(1)(a) of the Canada Evidence Act, Sedona Canada 2d’s footnote 247 (at p. 78 of the text), does refer to the national standards, but merely as a helpful suggestion for records management, which implies to the reader that such reference can be ignored. It imposes no “discovery procedures and disclosures requirement.”

And see: Ken Chasse, “The Sedona Canada Principles are Very Inadequate on Records Management and for Electronic Discovery.” (pdf., November, 2014). It was written before the publication of the second edition of the Sedona text in 2015, but none of it has been rendered out-of-date. In regard to the complete dependence of an electronic record upon its ERMS for everything (which is the basis for the “system integrity” requirement for admissibility), the second edition of Sedona Canada text provides no improvement.

Electronic copy available at: https://ssrn.com/abstract=3378077
a constantly growing body of laws and regulations, but also additions to government departments, police forces, inspectors, courts, judges, legal aid, insurance companies, and lawyers with sufficient knowledge of that technology, etcetera. Consider: if society had not been willing to pay that price, mass transportation would have had to remain based upon horses instead of upon motor vehicles and airplanes. The price paid over the last 120 years in the increased volume and complexity of such legal infrastructure has been massive and is still growing.

But law can never be enacted and enforced to say with total credibility, “pay the price of necessary legal infrastructure or don’t use the technology.” Legal infrastructure is never made sufficient to adequately regulate the technology that produces evidence for legal proceedings and legal services. It is a situation aggravated by the politicians’ fixed “wisdom” that says, “there are no votes in justice,” i.e., there are no significant quantities of votes to be gained by spending money on the justice system. And so, there are never enough courts and judges, and therefore, justice. As a result, the, “limiting of the time and cost of legal proceedings” by a strategy of limiting the issues to be decided, and the constant threat that “justice delayed is justice denied,” make the adequacy of procedural law a very vulnerable victim.\footnote{32 Such extra-judicial forces should be expressly acknowledged so that the persistent incompatibility of procedural law with the reality of technology may come to be known and understood. They have always shaped, if not dictated rules of procedure of all kinds, technology’s involvement notwithstanding. See these almost historical examples during my own career as a lawyer since Friday, March 25, 1966:}

1. Ken Chasse, “No Votes in Justice Means More Wrongful Convictions,” (SSRN, June 10, 2016, pdf.); online: <https://ssrn.com/abstract=2790625>. This article describes how chronic underfunding of the criminal justice system led to the practice of “plea bargaining” to relieve the intolerably long periods that accused persons in custody endured awaiting trial. Previously the Crown prosecutor never spoke to quantum of sentence. That meant the Crown had no plea-bargaining power at all. During my first years as an assistant Crown Attorney in Toronto, beginning in 1966, we never spoke to sentence, following the English practice laid down in, R. v. Butterwasser (1948), 32 Cr. App. R. 81. The operative principle was, “whereas guilt is an issue between the Crown and the accused; sentence is an issue between the sentencing judge and the accused.” And so, the case law stated that the Crown should never request a specific term of imprisonment: R. v. Lapierre, (1976), 17 N.S.R. 2d. 34 (N.S. App. Div., at p. 45, para. 32); and, Rex v. Benson and Stevenson (1951), 100 C.C.C. 247 (BCCA). But in the 1960’s and 1970’s, government funded legal aid programs came into effect, enabling many more accused persons to have lawyers and elect to go to trial instead of pleading guilty without counsel. That greatly overloaded the court system and prosecutors’ offices, thus lengthening the waiting periods for trial for accused periods in custody, in very over-crowded and poorly maintained jails. That led to “2 for 1” sentencing, meaning that judges took two days off the sentences they imposed for every day spend in such unconscionable conditions awaiting trial. And sometimes, “3 for 1 sentencing,” acknowledging 3 inmates being required to occupy a jail cell made for one, e.g., Toronto’s Don Jail, constructed in the middle of the 19th century. The above “No Votes …” article contains the speech in the House of Commons of the federal Minister of Justice and Attorney General of Canada, on April 20, 2009, blaming the over-crowding on this 2-for-1 sentencing practice, because, so he said, it enticed inmates to refuse to apply for release on bail in order to maximize such reductions of sentence. That was his excuse for introducing the Truth in Sentencing Act which added s. 719(3)-(3.4) to the Criminal Code, operative in 2010, ending the practice of 2-for-1 sentencing. But the sentencing case law thereafter contains statements that these amendments brought no relief to this “trial delay” problem. But to have dealt with the problem more effectively would have cost much more money.

And see: (2), as to the chronic under-funding and staffing of the Crown Attorney’s office in Toronto, the “Report of the Grand Jury for the Sittings of the Peace for the County of York commencing 2nd March 1970,” and the response of the Ontario Minister of Justice and Attorney General in the Ontario Legislature on March 13, 1970, dismissing all of the very critical findings of the Grand Jury, with a tone of annoyance, and blatantly “without due respect,” at, (1972), 18 Criminal Reports, New Series 63-76. Grand Juries have since been abolished in all
(House of Commons, Third Reading, December 3, 2018, now in the Senate), is the latest example, extending the illusion that justice can be done better by removing safeguards such as the preliminary inquiry. Reality is taking the sources of evidence to ever-greater complexity and speed of evolution, but the legislated law is taken, for political reasons, to ever increasing simplicity and ineffectiveness, i.e., Bill C-75 increases the probability of wrongful convictions. But the justice system, particularly so the criminal justice system, has always been treated that way.

Now, society’s dependence upon the many and expanding applications of electronic technology is developing much faster and more broadly and thoroughly than has and will its dependence upon motor vehicle technology, i.e., faster than did the transition from horses to motor vehicles. But now the legal infrastructure controlling the use of evidence produced by electronic technology’s application to systems and functions such as electronic records management, and mobile phones, lacks the necessary sophistication. Or, it is unjustly fixed and restrictive, as is, for example, the opportunity provided to challenge the performance of breathalyzer and intoxilyzer devices (e.g., the “evidence to the contrary” opportunity provided by the words, “in the absence of evidence tending to show all of the following three things,” in Criminal Code s. 258(1)(c) and (d)). There is however, a “safeguarding procedure” required to be performed by Criminal Code s. 258(1)(g)—testing the breathalyzer device with a solution of alcohol of a known concentration immediately before testing the suspect. However, this safeguard applies only in relation to the offences in Criminal Code s. 253—impaired driving and “over 80” (see the reference in Criminal Code s. 258(1)(g) to s. 254(3)). Are there comparable safeguards for other types of technology-produced evidence? Apart from legislation and the regulation-making authority within legislation, National Standards of Canada applicable to various types of technology could impose them and be made enforceable by regulations.

In addition, the technical literature warns that we trust the software by which all electronic systems and devices operate, far too much—see Sections 7 and 8, below. And in further aggravation of this situation of lawyers’ and law students’ ignorance of technology’s many potential impacts upon the efficacy and fairness of procedural law, our legal education is not keeping up—both at law school and law society CPD/CLE requirements. Is there a course or seminar that makes the relationship between technology and rules of procedure a significant part of its content?

And there is no apparent sign in the caselaw yet that law professors are teaching such relationships jurisdictions in Canada. See also, Eugene Ewaschuk, “The Role of the Grand Jury Re-Evaluated,” (1972), 18 Criminal Reports, New Series 41-63. (The author later became, Mr. Justice Ewaschuk of the Superior Court of Ontario).

34 Supra notes 7, 8, and 32, and accompanying texts.
between the rules of procedure and evidence that govern different legal proceedings such as those dealing with admissibility and discovery, and various types of technology. Such rules should now be applied flexibly so as to be made to vary with the nature of the technology involved. Nor is there in their law journal writings a comprehensive view of the institutions of the justice system taken in relation to such issues and problems.

And because the law of evidence is scattered among various sources including several statutes and their voluminous case law, we need an evidence code, for the reasons stated by the Law Reform Commission of Canada in its Report on Evidence (published in December, 1975). The Canadian Charter of Rights and Freedoms is a code; the Criminal Code is not.35

Inadequate procedural law that thereby creates a de facto undeclared presumption of infallibility, makes for very fallible legal proceedings. We all endure the frequent, if not daily, failures and interruptions imposed by the electronic systems and devices upon which we all are heavily dependent. But to the contrary, law and practice treats those sources of evidence as though infallible, in the absence of rules providing adequate opportunity to challenge performance.36

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Lawyers’ and law students’ legal education as to the interplay between law and technology is not keeping pace and so, neither does the law as argued and developed in the courts and its case law. Judges decide cases by way of the evidence and argument presented by the lawyers who appear before them. And so, the law’s development by way of case law is thereby limited to the content and quality of that evidence and argument, which in turn is dependent upon the state of lawyers’ education. Also, the national access to justice, “unaffordability of legal services” problem means that litigants and other clients cannot pay for experts to educate their lawyers about technology, and be expert witnesses. Law society “alternative legal services” are too simplistic to include providing experts, and being almost all charity, cannot pay for experts


36 For an example of the absence of adequate rules by which to challenge the performance of a frequently used source of evidence, see: Ken Chasse, “Guilt by Mobile Phone Tracking Shouldn’t Make ‘Evidence to the Contrary’ Impossible” (SSRN, Oct. 13, 2016, pdf.); online: <https://ssrn.com/abstract=2846548>. And in regard to the Oland case, see supra notes: 2, 4, 6, and 15, and infra notes 43 and 52, and accompanying texts.
to advise on technology.\textsuperscript{37} And Legal Aid’s funding cannot do it (but possibly for a murder case), or if a court orders state-funded counsel be provided to the accused person by way of a \textit{Rowbotham} order.\textsuperscript{38}

Most of the evidence now used in legal proceedings and for legal services is produced by electronic systems and devices. But the reliability of the technology that produces evidence cannot be accurately judged without authoritative national and international performance standards, such as National Standards of Canada; see Section 4 below. But litigation lawyers don’t know of national standards even though the law expressly provides for their use, and legislation and regulations are becoming increasingly dependent upon standards.\textsuperscript{39}

\begin{footnotesize}
\begin{enumerate}
\item Alternative legal services (ALSs) are, for example: clinics of various types; self-help webpages; phone-in services; paralegal and law student programs; family mediation services; court administrative procedures simplification projects; arbitration and mediation for dispute resolution; public legal education information services; targeted (unbundled) limited retainal legal services (as distinguished from a full retainal to provide the whole legal service); pro bono (free) legal services for short and simple cases; and the \textit{National Self-Represented Litigants Project}, the purpose of which is to help self-represented litigants to be better litigants without lawyers. ALSs are for the most part, charity, simplistic, and do not provide a traditional solicitor-client relationship (an attorney-client relationship, with the exception of legal services provided \textit{pro bono}), which includes: (1) the fiduciary duty that requires the lawyer to act in the best interests of the client; (2) law society financial oversight and discipline of lawyers; (3) professional liability insurance; and, (4) continuing professional development (CLE) educational requirements to maintain competence.

In sharp contrast to these benefits of the solicitor-client relationship is the merely buyer-seller relationship by which the legal services of the commercial producers, such as \textit{LegalZoom} (\textit{LegalZoom Canada}), LegalX, and Rocket Lawyer, are provided. Therefore, ALSs are a great insult to that majority of taxpayers who cannot afford lawyers but must pay for the justice system whereat all lawyers, directly or indirectly, earn a better living than do those taxpayers. The resulting resentment is well expressed in this article, “I Don’t Want a Free Lawyer, I Want a Real Lawyer,” (the \textit{Lawyerist} com (November 14, 2016); online: <goo.gl/ZhioMx>.


\item See: \textit{R. v. Rowbotham} 1988 CanLII 147 (ONCA), at paras. 142-170; 41 C.C.C. (3d) 1, at 66 (Ont. C.A). In \textit{R. v. Moodie}, 2016 ONSC 3469, Nordheimer J. (now a Justice of the Ontario Court of Appeal), granted such an order. He pointed out (para. 6), that the cut-off income level used by Legal Aid Ontario, for an accused person in the circumstances of Mr. Moodie, was half that which Statistics Canada specifies as being the “poverty line” for a single person living in a metropolitan area. He stated, “It should be obvious to any outside observer that the income thresholds being used by Legal Aid Ontario do not bear any reasonable relationship to what constitutes poverty in this country.” See also \textit{supra} note 25 and accompanying text.

\item See for example, s. 31.5 of the \textit{Canada Evidence Act} which encourages the use of standards in relation to “admissibility” proceedings for electronically-produced records. See its provincial and territorial Evidence Acts and Civil Code of Quebec counterparts listed in the “Appendix B” references \textit{supra} in note 31. And \textit{Pepida} (the Personal Information Protection and Electronic Documents Act), s. 5, requires compliance with the national standard entitled, \textit{Model Code for the Protection of Personal Information}, CAN/CSA-Q830-96. See also Section 4 of this text, below.

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\end{footnotesize}
As to reliability; the more complex such systems and devices are: (1) the more ways they can break down and otherwise perform inadequately; and therefore, (2) the more demanding must be the requirements for their, manufacture, proper use, and, maintenance, each of which creates a possibility of human error, for which, procedural law should be capable of providing an effective and economic way of challenging the reliability of such sources of evidence. But it doesn’t.

Using standards as evidence—national and international—that provide the principles, policies, and required practices for the use and maintenance of technology of various types, are known of by few lawyers. Such ignorance of records management principles and practices is a sufficient reason in itself why authoritative standards should be treated as being of critical importance to the use of records as evidence. Equally unknown are the vulnerabilities to error of that technology, particularly so its software. Because of its complexity and the extreme pressure to get it to market before one’s competitors, software is composed with poor quality-control, and as a result, has high error rates in the writing of tens of millions of lines of source code. But in the caselaw and other legal literature, standards are relegated to the status of a minor subject at best, and provided but a passing reference, if any reference. They are not considered to be something that counsel need worry about when preparing for court or other formal or semi-formal presentations, such as, administrative tribunals, speaking at conferences and seminars, and teaching law students.

For example, electronic records management systems (ERMSs) that are not well maintained have an increased probability of losing and destroying records and corrupting data. Like all applications of

<https://www.scc.ca/en/annual-report-2017-2018-landing-page>, contains an extensive description of the many legislative and policy development areas in which national standards are referred to in regulations enacted by way of the regulation-making powers contained in such legislation.

40 See Section 6 below, “Software Errors and Vulnerabilities are Very Prevalent and Costly,” with particular regard to the NIST study of the U.S. Department of Commerce. See also infra notes 72, 73, and 79 and accompanying texts.

41 For example, there is but one case that cites the National Standard of Canada, Electronic Records as Documentary Evidence CAN/CGSB-72.34-2005 (now, “72.34-2017,” being a second edition declared by the Standards Council of Canada to be a national standard on March 1, 2017): R. v. Oler 2014 ABPC 130 (see the references to 72.34 in paras. 3, 6, 7, 11, 14, 19, and, 29 of Oler). It was used to determine the reliability of the Calgary Police Service’s record system. However, Oler was overruled by R. v. Vallentgoed, 2016 ABCA 358, on the issue as to whether the Crown prosecutor must produce to the accused the maintenance records for the breathalyzer/intoxilizer device that provided the readings as to blood-alcohol concentration (BAC) that were the basis of the prosecution for impaired driving and “over 80” (Criminal Code s. 253(1)(a),(b)). Vallentgoed does not deal with the use of the 72.34 national standard in relation to the issue as to the reliability of the BAC readings. (An appeal to the Supreme Court of Canada was dismissed, the Court holding that such maintenance records are third party records which requires an O’Connor application (R. v. O’Connor, 1995 CanLII 51, [1995] 4 S.C.R. 411) by the accused to obtain such records; see: R. v. Gubbins and Vallentgoed, 2018 SCC 44. As to obtaining a pdf. copy of the 72.34-2017 national standard, see online: <https://www.techstreet.com/cgsb/searches/18423558>. And see also supra notes 29, and 37-40, and infra notes 54, 59, 60, and 63, and accompanying texts.

42 See supra note 11 and accompanying text.
electronic technology, they operate on software. All electronic systems and devices store data, i.e., store records, any one record or part of which might become evidence. Without certification of compliance with records management standards, it cannot be known for certain (or, “beyond a reasonable doubt” to justify a criminal conviction): (1) if electronic discovery in civil proceedings and disclosure in criminal proceedings, are effectively and reliably serving their purpose to produce all relevant records and locate those among them that are “privileged” records, e.g., records that are solicitor-client communications and therefore do not have to be produced; (2) that “admissibility of evidence” proceedings can adequately determine the reliability of records; (3) whether the records produced are relevant and are all of the relevant records that should be produced by the parties to proceedings; and, (4) whether those produced are the “originals.”

The electronic record provisions of Canada’s federal, provincial, and territorial Evidence Acts state as much, i.e., the reliability of a record depends upon the reliability of the ERMS it comes from. For example, in regard to the use of standards in determining the admissibility of electronically-produced records, the Canada Evidence Act (CEA) states in sections 31.2(1)(a) and 31.5:

31.2 (1) The best evidence rule in respect of an electronic document is satisfied
(a) on proof of the integrity of the electronic documents system by or in which the electronic document was recorded or stored;

31.5 For the purpose of determining under any rule of law whether an electronic document is admissible, evidence may be presented in respect of any standard, procedure, usage or practice concerning the manner in which electronic documents are to be recorded or stored, having regard to the type of business, enterprise or endeavour that used, recorded or stored the electronic document and the nature and purpose of the electronic document.

The use of standards is merely suggested, and impliedly advisable. In fact, s. 31.5 is not really necessary to enable the use of such standards. But best that it is there because national standards are not considered by most lawyers in relation to such evidentiary problems. To know in fact what that key word “integrity” in s. 31.2(1)(a) means, an authoritative national or international standard that establishes the principles,

43 For example, discussed below are the decisions in these two pre-trial voir dires, concerning the admissibility of mobile phone tracking evidence, held prior to a second degree murder trial in the New Brunswick Court of Queen’s Bench, in 2015: (1) R. v. Oland 2015 NBQB 245 (admissibility of the data produced by a particular mobile phone call); and, (2) R. v. Oland 2015 NBQB 244 (admissibility of the expert opinion evidence based upon that data, as to where the mobile phone was at the time of that particular call, which mobile phone was alleged to have been in the possession of the accused person at that critically important time and place). The data that was the foundation for that critically important expert opinion evidence was held in a large, national, and very complex electronic records management system for more than a year before it was downloaded by the authority of a court-ordered demand, and then used by radio frequency engineers to formulate their expert opinion as to the location of the mobile phone at the time of the call. Such opinion evidence was of critical importance to the conviction of Oland for second degree murder. (However a new trial was ordered as a result of an appeal concerning an issue unrelated to the mobile phone evidence; see: R. v. Oland 2016 NBCA 58. The new trial (judge alone) began in November, 2018; closing addresses, Feb. 20, 2019.) The pre-trial voir dires were held in reverse order because of witness availability difficulties. See also the references to Oland in supra notes 2, 4, 6, 15, and 36, and infra note 53, and accompanying texts.
practices, and necessary performance levels of good ERMS management, is necessary, i.e., to define the required “integrity,” so that it can be effectively and fairly applied.

As to lawyers’ state of knowledge of how electronic records are created and stored, and their vulnerability within their ERMSs, consider: if expert opinion evidence were admitted into evidence in the way that electronically-produced records are ruled admissible, there would be no evidence as to the qualifications of expert witnesses, even though such evidence is most often the most important single factor in determining the worth of an expert’s opinion. The “qualifications” of an electronic record are the qualifications of the ERMS in which it is stored and from which it is accessed. That is what the “systems integrity” test created by s. 31.2(1)(a) CEA requires—proof of such ERMS’s qualifications is what establishes its “integrity.” This legislated paragraph 31.2(1)(a), captures that essential concept of “systems integrity”—the concept upon which ERMS technology is based. It bases evaluations of the integrity (reliability) of an electronic document upon “the integrity of the electronic documents systems.” That captures the foundation principle of ERMS technology, i.e., “records integrity is dependent upon records system integrity.” But it is a concept not used in the case law that applies such Evidence Act provisions.44

The case law concerning the use of electronic records (e-records) as evidence treats such records as being merely a speeded-up and more convenient version of pre-electronic paper records. Therefore the requirements of the e-records provisions of the Evidence Acts and their “system integrity concept” (e.g., s. 31.2(1)(a) of the Canada Evidence Act (CEA)) are ignored. In fact, paper records technology and e-records technology are very different—as different as horses and bicycles are from motor vehicles and airplanes, although they all involve transportation.

This article emphasizes the dependence of an e-record upon its electronic records management system (its ERMS) for everything; particularly so for its, existence, accessibility, and “integrity” (the key word used in the e-records provisions of the Evidence Acts). The state of records management of an ERMS can have considerable impact upon those three factors. Therefore, the state of knowledge and investigation of such factors by the police when obtaining records, should be part of the disclosure and production of records from the Crown prosecutor to defence counsel.

When disclosure and production of records are made months later, the state of records management at that earlier time will not be known. Record systems change quite regularly, which can affect what can be accessed and therefore what is disclosed; e.g., new electronic equipment and software is introduced; additional records management procedures and personnel are added; mergers and acquisitions requiring two very different and large ERMSs be melded into one, occur frequently. Apart from those causes, there

44 Those provisions are all listed in the “Appendix B” references listed supra in note 31, for all of Canada’s ten provinces and three territories, and the federal jurisdiction.
are many serious and common defects in ERMSs that can affect accessing relevant records—the list of such common defects is long.\textsuperscript{45}

The concepts and arguments developed herein have been facilitated by what I have learned from experts in electronic records management, with whom I have worked for many years. This is law based upon technology, but those who have written the case law have disregarded the technology. That is due to the weaknesses of counsel’s arguments.

An electronic record is merely an electronic impression upon an electronic storage device, which is but a part of an electronic records management system (an ERMS). An e-record in its ERMS, is like a drop of water in a pool of water. Like a drop of water, an e-record is dependent upon its ERMS (its “pool”) for its: (a) existence; (b) accessibility; and, (c) its integrity. A pre-electronic paper record is not dependent upon its records system for any of these three factors because it has a physical existence and not merely an electronic existence which can be only what the ERMS that contains lets it be. But a paper record is not affected by the file drawer that contains it. Therefore, the laws and practice as to disclosure, discovery and admissibility of evidence, must be different for e-records than they are for pre-electronic paper records. Regulatory procedures for electronic discovery have been created in civil proceedings that should be made equally applicable to criminal proceedings.\textsuperscript{46} But the understanding as to what an e-record is has not changed from that of its pre-electronic paper record counterpart. The pre-electronic views and practices continue. That is why ERMSs and the quality of records management are not considered in the case law. Therefore, court decisions based upon e-records will have some probability of being faulty and therefore unfair.

The “system integrity concept” that is in the electronic records provisions in 11 of the 14 Evidence Acts in Canada,\textsuperscript{47} dictates that the use of an e-record as evidence requires an assessment of the records management of the ERMS in which it is stored—“records integrity” requires proof of “record system integrity.” That is the foundation concept of the work of experts in electronic records management. And it is the foundation concept of the National Standard of Canada for electronic records management: \textit{Electronic Records as Documentary Evidence} CAN/CGSB-72.34-2017 (pdf; hereinafter referred to as “72.34-2017”), which is largely ignored by the legal profession and the case law of electronic disclosure and discovery and admissibility. But the admissibility rule of the e-record provisions of the Evidence Acts requires proof of,
“the integrity of the electronic documents system by or in which the electronic document was recorded or stored” (s. 31.2(1)(a) CEA). Therefore, a standard is needed, such as 72.34-2017, by which to assess the presence of such required “integrity” in any ERMS. That “system integrity concept” should therefore be the foundation concept of everything that lawyers and judges do with e-docs as evidence.

Because there is no law of general application requiring institutional ERMSs be maintained in compliance with the national standard, defects that can interfere with the existence, accessibility, and integrity of e-docs are numerous and very common. And many organizations fail to provide adequate records management maintenance for their ERMSs because they find that they can “get along just fine” using only their most recently made records.

Being able to access older records might not be necessary for day-to-day business. But often in litigation, it is the older records that are most important because they are records that were made when key contracts, agreements, and undertakings were made. Present law and practice provide no protection against such common defects. Therefore, during e-disclosure and discovery proceedings concerning large ERMSs, opposing lawyers should be asking one another: “Is your client’s electronic records management system in compliance with the National Standard of Canada for electronic records management, and if so, when was the last time it was so certified by an expert in electronic records management?” Small ERMSs may not need expert certification, but should be prepared to answer to the requirements of the national standard.

A second example of the lack of understanding of the impact that technology should have upon the laws of procedure is the following article by David M. Paciocco, “Proof and Progress: Coping with the Law of Evidence in a Technological Age,”49 (when he was Judge Paciocco of the Ontario Court of Justice). He categorizes the electronic record provisions such as, ss. 31.1-31.8 of the Canada Evidence Act, as being merely concerned with, “the propriety of the delivery mechanism for evidence.”50 I don’t know what is the intended meaning of that statement. It implies that the electronic records provisions of the Canada Evidence Act, and its counterparts in the Evidence Acts of the provinces and territories of Canada, can be ignored! Another such statement is: “There is nothing in the law of evidence arising from these new technologies that should scare us.”51 That is wrong and misleading as to the necessary analysis required by the

48 For a list of such common serious defects see supra note 11 and accompanying text.
49 (2013), 11 Canadian Journal of Law and Technology 181. The author is now, Paciocco J.A., of the Court of Appeal of Ontario. His article does not cite the two national standards operative at that time: (1) Electronic Records as Documentary Evidence CAN/CGSB-72.34-2005; and, (2) Microfilm and Electronic Images as Documentary Evidence CAN/CGSG-72.11-93 (updated to 2000, but withdrawn by CGSB (the Canadian General Standards Board) as an active national standard shortly after 72.34-2017 was declared to be a National Standard of Canada on March 1, 2017, supposedly because 72.34-2017 is intended to be capable of serving the same purpose. See also, Gerald Chan and Susan Magotiaux, Digital Evidence (Emond Montgomery Publications Ltd., 2018).
50 Ibid. at p. 194.
51 Ibid. at p. 181. Other such statements are: p. 201: “When these provisions are given an overlay of common sense,
evidentiary issues presented by technology’s many complex sources of evidence. As a result of such views, not understood is the great difference made by the large transition in technology from pre-electronic physical paper records, to intangible electronically-stored records. And so the law concerning the admissibility of records has not been changed by that transition in records technology. Therefore, law and reality diverge.

But, Judge Paciocco is now a Justice of the Court of Appeal of Ontario. In *R. v. Oland*, 2015 NBQB 245, a judgment in a pre-trial *voir dire* dealing with the admissibility of mobile phone tracking evidence for a second degree murder trial, his article is quoted by Walsh J., and referred to several times (in paras. 41, 43, 48, 49, 54, 79, and 104), and he is referred to as an expert on the subject of technology and the law of evidence, and referred to with much praise.

And in the recently published book by Gerald Chan and Susan Magotiaux, *Digital Evidence, A Practitioner’s Handbook*, (Emond Montgomery Publications Limited, 2018), Judge Paciocco’s article is referred to (p. 165) as, “his influential article.” It shouldn’t be. In fact, because Judge Paciocco has achieved such prominence, the theme promoted by his article is contrary to the urgently needed refinement of the rules of evidence and procedure so that they are capable of coping with evidence produced by complex electronic technology. As, explained in this text those rules are currently very incapable of coping.

The *Oland* case provides a good example of the need for counsel to be able to argue why the particular technology that produces the evidence in question, requires that the rules of procedure that control a *voir dire*, if they are to provide an adequate and fair procedure, must be applied compatibly with the nature of that particular technology. Instead, in *Oland* the onus of proof to provide “evidence to the contrary” was unfairly transferred during the pre-murder trial *voir dire* as to the admissibility of the data generated by a critically important mobile phone call. It was transferred to the accused upon the Crown’s adducing very minimal evidence in proof of the reliability of the evidence sought to be ruled admissible—minimal evidence by minimal witness evidence that provided no opportunity for the accused to challenge the reliability of the very technology-based source of the evidence. That was hardly a fair procedure providing they can perform their function unobtrusively”; p. 226: “As can be seen, for the most part the laws of evidence are suitable without radical transformation to cope with new technologies”; and, p. 228: “The law is well equipped for coping with the law of evidence in a technological age.”

52 Are “electronic records” the same as “digital records”? No! I use herein the term “electronic record,” for the reason given in the second paragraph of the Introduction (p. iv) of the National Standard of Canada, *Electronic Records as Documentary Evidence* CAN/CGSB-72.34-2017 (hereinafter, “72.34-2017”), which states: “This standard uses the term ‘electronic record’ rather than ‘digital record.’ Whereas the term ‘digital record’ refers to a record composed of discrete binary values aggregated into one or more bit stream[s], the term ‘electronic record’ encompasses any digital record as well as any analogue record that is carried by an electrical conductor and requires the use of electronic equipment to be made intelligible to an individual.” And see below, Section 4. “A New National Standard of Canada for Electronic Records Management Systems.”
an adequate opportunity for “full answer and defence,” albeit one consistent with the available legal literature of case law, etcetera.\(^{53}\)

The mobile phone, being that of the victim, was alleged to have been taken by the accused upon murdering his father, and later allegedly in his possession at the time of the call. The Crown used expert opinion evidence to prove that the location of the phone at that time was where other evidence positioned the accused. Such “location evidence” does not require that such a call be answered by the intended recipient, or that there be an actual communication. Thus it was, (as confirmed by my discussions with lead defence counsel, Alan D. Gold), that the “mobile phone tracking evidence” was of “critical importance” to the conviction.

The evidence as to the downloading of the data onto a disc, then given to the police pursuant to a court-ordered demand, was provided by security employees of Rogers Communications, the providers of the mobile phone service. That evidence also revealed that Rogers received on average, 1,500 such requests per year for such mobile phone data. Therefore, Rogers used “security department” employees, trained to answer such requests in a simple, routinized fashion.\(^{54}\)

However, to understand the considerable technical complexity underlying the extracting and producing such data, the Oland pre-trial voir dire decisions should be read closely.\(^{55}\) But, the Crown’s witnesses were security employees having no knowledge of, or responsibility for the performance of the complex ERMS in which the data had been kept for more than a year before its production was demanded. However, I know from my own experience working with experts in electronic records management systems for many years

\(^{53}\) The right to have an opportunity “to make full answer and defence” is protected by “the principles of fundamental justice” provisions of Canadian Charter of Rights and Freedoms s. 7; see: R. v Stinchcombe, 1991 CanLII 45 (SCC); and, Dersch v. Canada (A.G.) 1990 CanLII 3820 (SCC).

\(^{54}\) Justice John J. Walsh stated in his judgment (2015 NBQB 245), in regard to the admissibility of the mobile phone call data (para. 11): “As would be expected given our mobile and technological age, communication service providers such as Telus and Rogers are routinely tasked by courts across the country with producing CDRs for criminal justice purposes). … For example, Rogers alone receives approximately 1,500 Production Orders in a year, all requiring timely responses. And, the information sought can provide probative evidence (See e.g. R v. Ranger 2010 ONCA 759 (CanLII)). It is not surprising then that both Telus and Rogers have in-house processes in place to meet those kinds of demands.”

Mobile phone tracking evidence is becoming very frequently used. Reducing the number of witnesses the mobile phone service providers will have to make available will require a system using detailed certificates be created, similar to that used to present breathalyzer blood-alcohol-content (BAC) readings (Criminal Code s. 258(1)(e)-(i)). But such BAC readings certificates are provided by trained police breathalyzer operators.


“Cell phone propagation maps do not establish precise locations from which calls have been made, only the general area from which the call originated. The maps are not 100 percent accurate, rather ‘guesstimates’ place their accuracy at between 60 and 80 percent, or possibly even lower. Said in another way, the rate of error may be 40 percent or more.”
that the incidence of bad records management is shockingly high, and its software has high error rates.\textsuperscript{56} Such data does not sit stationary, like a paper record in a file drawer. It is continuously subject to being moved by the ERMS’s operating system to make more room for, and favorably prioritize the accessibility of more frequently accessed records. All the while it is subject to the quality of the system and the vulnerabilities of the technology, including the error rates of its software source code and its software architecture. The case law and other legal literature must never be allowed to lose sight of the fact that, the more complex the technology, the more ways and probability it has of breaking down if not well manufactured, used, and maintained in good operating condition.

The case law should have been previously and knowingly developed so as to require Crown counsel to use as witnesses the Rogers’ engineers and technicians who knew the technology well, and were responsible for its performance. That would have allowed defence counsel to challenge the reliability of the technology that had produced the evidence at issue, by cross-examining those key knowledgeable witnesses. Instead, in such circumstances, an \textit{O’Connor} application would have had to be made by defence counsel to gain court-ordered access to Rogers’ electronic records management system for purposes of having defence-retained experts conduct the necessary electronic records management system’s examination to determine the degree of compliance with the 72.34-2017 national standard, and the repairs and alterations needed to bring it into full compliance. Such examinations require the application of 265 tests, following upon extensive interviews of the employees accountable for the management and maintenance of that system.

And counsel for Rogers Communications can be expected to be strenuously objecting to the granting of such an access order, claiming: (1) Rogers’ need to protect the confidentiality of customer-supplied information from outsiders: (2) the protection of intellectual property and property rights from competitors; and, (3) the disruption, time lost, and cost created by such interviews of their employees. Obtaining such court-ordered access, and paying for such experts would make trying to obtain the necessary “evidence to the contrary” extremely difficult, and definitely beyond the financial means of all but a very few defendants.\textsuperscript{57}

The trial judge referred to defence counsel’s very apt complaints as to the minimal content of the Crown’s evidence (at para. 60):

\begin{quote}
[60] It is at this juncture that I refer more directly to the Defence arguments that there is no knowledgeable evidence of the proper operation of Rogers’ data collection computer systems at the relevant time as well as no evidence of the capability of the ‘Cognos’
\end{quote}


\textsuperscript{57} A much more in-depth analysis of the whole of the voir dire procedure and of \textit{R. v. Oland} 2015 NBQB 245 is provided by this article, Ken Chasse, “\textit{Guilt by Mobile Phone Tracking Shouldn’t Make ‘Evidence to the Contrary’ Impossible}” (SSRN, October 13, 2016, pdf.), 91 pages, online: <https://ssrn.com/abstract=2846548>.
software to accurately extract that information. The Defence refers the Court to the sensible statement that the “reliability of a record is inextricably linked to the reliability of the records management system under which the record was created and stored” (*Electronic Evidence in Canada*, supra at p. 3-5). The Defence also go on to punctuate its arguments by asking the Court to bear in mind that “we do not know what we do not know” and that “it is fallacious to assume a computer system always operates properly”.

But, following the case law and other authorities, the trial judge concluded (para. 64):

> [64] The foregoing represents circumstantial guarantees of trustworthiness. In saying that, I fully recognize that the evidence on the operation of Rogers’ computer systems in relation to the source records is minimal. But, in the absence of evidence to the contrary, in my view the *Canada Evidence Act* really does not demand more in circumstances such as these:

> Item i., s. 31.3 (a), requires only evidence capable of supporting a finding of proper or unimpaired operation of the relevant electronic document system. The proponent has only an evidential burden.

> (*Watt’s Manual of Criminal Evidence*, supra, at p. 1088)

Clearly, greater knowledge of the technology that produces the evidence has to be brought to bear in the formation of the rules of procedure that govern such proceedings that determine the admissibility of such critically important evidence, particularly so when life imprisonment is at stake. Our legal education and case law lack that content.

Counsel should argue that national standards can be helpful in applying the various burdens of proof. Their purpose is to avoid the use of unreliable evidence. But they should not be applied so as to require proof of an electronic system’s or device’s absolute perfection in the production of reliable evidence. A very workable dividing line is a burden of proof that in effect asks, “is it up to standard?”

In contrast, considering the paragraphs quoted above from the *Oland* case (paragraphs 60 and 64), the Crown’s burden of proof (“circumstantial guarantees of trustworthiness”) was set so low, and the defence burden of proof (“evidence to the contrary”) was set so high, having regard to the very complex technology involved, with the result that in fact the voir dire was close to beginning with a presumption of admissibility, which the defence would have to overcome. As the statements referred to in paragraph 60 reveal, there was no proof required as to the reliability of the ERMS that produced the evidence.

Required or expected proof of an electronic system’s or device’s compliance with an authoritative national or international standard would ensure that the onus of proof was not transferred too early as it was in *Oland*, with the result that producing “evidence to the contrary,” was next to impossible. An authoritative standard would state the principles and factors relevant to a particular technology’s “circumstantial guarantees of trustworthiness.” Such principles and factors of the ERMS technology used to produce the evidence in *Oland* were not referred to or dealt with. That is what paragraph 60 should be understood to
These are the issues of fact and law and disclosure that a preliminary inquiry can deal with so as to provide, better preparation for trial, a fairer trial, and a more efficiently conducted trial.

References in legislation in relation to admissibility proceedings of various types can be of three kinds:

1. merely a suggestion that standards be used, e.g.; s. 31.5 of the Canada Evidence Act and its provincial and territorial counterparts;

2. proof of compliance with a relevant standard is one way of proving admissibility but it is not the only way, e.g.; Ontario’s Electronic Commerce Act, concerning the integrity of information in an electronic document, s. 8(2)(a) does not cite a formally constituted standard, but it does establish a firm but flexible standard by its use of the words, “the criterion for assessing integrity is whether the information has remained complete and unaltered, apart from the introduction of any changes that arise in the normal course of communication, storage and display”; and,

3. admissibility must be proved by way of proof of compliance with a designated standard; e.g.; s. 5 of the federal, Personal Information Protection and Electronic Documents Act (PIPEDA), makes mandatory every organization’s compliance with the National Standard of Canada, Model Code for the Protection of Personal Information, CAN/CSA-Q830-96, which requires an ability to prove all of the many subdivisions of its ten principles as to the privacy of personal information.

The same three can be used in relation to satisfying the various burdens of proof, such as: (1) “proof beyond a reasonable doubt”; (2) “proof on a balance of probabilities”; (3) “a case of probable guilt”; and, (4) “circumstantial guarantees of trustworthiness.” Given that most of the evidence now used in legal proceedings (and for legal services) comes from electronic systems and devices, such use of technical standards such as, Electronic Records as Documentary Evidence CAN/CGSG-72.34-2017, should be greatly increased and taught. For example, if laws were more expressly written to use, rely upon, or command the use of standards, lawyers would advise their clients that by keeping their ERMSs continuously in compliance with the national standard, the cost and complexity of litigation could be significantly reduced.

One has to take a comprehensive view of the justice system as a whole to understand why it is that lawyers are not capable of challenging the reliability of the electronic systems and devices that produce most of the evidence now used in legal proceedings. So far, the justice system is not able to cope with the

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A more developed analysis of the fairness of the use of the “evidence to the contrary” onus of proof has occurred in relation to the presumption created by Criminal Code s. 258(1) as to the reliability of the breathalyzer blood-alcohol content readings. There, such “evidence to the contrary” to overcome the presumption is expressly limited by the phrase, “in the absence of evidence tending to show all of the following three things,” i.e., the presumption will operate unless there is evidence proving those three specified things. Any finding that such a presumption violates Canadian Charter of Rights and Freedoms provisions as to “fundamental justice,” (s. 7), and “fair trial,” (s. 11(d)), is subject to the “reasonable limits” analysis of s. 1 of the Charter. See: R. v. St-Onge Lamoureux, 2012 SCC 57, Nov. 2, 2012; R. v. Dineley, 2012 SCC 58, Nov. 2, 2012; and, R. v. Cyr-Langlois, 2018 SCC 54, December 6, 2018.
electronic age because it is not an integrated, coordinated, and unified whole. Each part of it gives top priority to its own interests.

All of the factors listed in the Introduction above (pp. 1-10), must be considered together in order to make clear that the various several and uncoordinated parts of the justice system operate so as to make the ability of lawyers to challenge the reliability of technology’s evidence inadequate, and so are the applicable laws of evidence.

5. A NEW NATIONAL STANDARD OF CANADA FOR ELECTRONIC RECORDS MANAGEMENT SYSTEMS

The national standard, Electronic Records as Documentary Evidence CAN/CGSG-72.34-2017 (“72.34-2017,” pdf.),\(^{59}\) was declared to be a national standard by the Standards Council of Canada on March 1, 2017. It is a second edition of the original 72.34-2005 standard, declared to be a national standard in December 2005. I know from having worked with that first edition, and with experts in electronic records management for many years in the certification of ERMSs with this national standard, that it has served its purpose and those experts very well, without incurring any difficulties or criticism. Such experts provide their clients with certifications of compliance with it; a process requiring the application of 265 tests after extensive interviews of those responsible for the management and performance of the ERMS being examined for certification.

But this national standard’s second edition, 72.34-2017, is not as deserving due to the rushed and incompetent way in which it was drafted, about all of which I told the Standards Council of by way of a detailed 100-page complaint, long before the Council declared the final draft to be a National Standard of Canada.\(^{60}\) It establishes the principles and practices by which ERMSs are to be maintained. Therefore, there

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59 Online download: <https://www.techstreet.com/standards/can-cgsb-72-34-2017?product_id=1947330>. The first edition, 72.34-2005, was applied in R. v. Oler, 2014 ABPC 130. But Oler was overruled in R. v. Vallentgoed, 2016 ABCA 358, on the issue as to whether the Crown has to produce the maintenance records of breathalyzer instruments; the majority holding that the Crown does not have to disclose them. But the use of the 72.34 national standard in Oler was not in issue. See, R. v. Gubbins and Vallentgoed, 2018 SCC 44, which held that breathalyzer device maintenance records are third party records, therefore the accused can obtain them only by way of an O’Connor application (R. v. O’Connor 1995 CanLII 51, [1995] 4 S.C.R. 411). See also supra note 41 and accompanying text.

60 See: Ken Chasse, (1) “Innovation Canada, IP, and Dependence Upon the Standards Council of Canada” (SSRN, February 2, 2018, pdf.; online: <https://ssrn.com/abstract=3107800>); (2) “Election Politics, Innovation Canada, IP, and Dependence Upon the Standards Council of Canada,” (Slaw, May 24, 2018). Because of the improper procedures used to create it and the errors of law in it, the 72.34-2017 national standard should be withdrawn by CGSB, and the drafting project carried out again. In the interim, the first edition, 72.34-2005, should be re-activated, along with the imaging standard, 72.11-93. See also supra notes 3, 11, 17, 30, and 49, and infra note 59 and accompanying text.

I was the Chair of the drafting committee for 72.34-2017. But because of the improper procedures being used by CGSB, I and my colleague, Martin Felsky resigned before the project was completed.

Martin Felsky, PhD. J.D., is a member of the Law Society of Ontario, and, Vice President, Electronic Discovery and Information Governance, Forensic & Integrity Services at Ernst & Young LLP, Toronto, and formerly, National e-
are many laws dependent upon this national standard. Records are now the most frequently used kind of evidence in legal proceedings and for legal services. And because we all rely upon records, our own records and those of the people and institutions that do things for us and make decisions about us, it is as important as a national standard can possibly be.

But because unqualified people took part in drafting 72.34-2017, it contains many statements that are errors of law, most of which are in its section 5 legal section (pp. 9-13). It should be withdrawn and drafted again, but with greater oversight of, and accountability to a competent Standards Council of Canada being required of the standards development organization (SDO) involved, which is, the Canadian General Standards Board (CGSB). Such a standard is written to advise experts in ERMS technology; not lawyers. It is the basis of their work in serving clients and employers, they being institutions and organizations of all types. To provide legal information (as distinguished from legal advice) they will copy parts of that legal section, word-for-word into their reports to clients. They expect to find all that they need within that section and not spread throughout the text of the standard among all of its various sections.

Therefore the legal section of such a standard, which is used to provide relevant legal information for its users, must be made subject to that added requirement, i.e., in addition to these three requirements: (1) such references must be accurate; (2) comprehensive of all legal issues related to the subject matter of the standard; and, (3) well written so that users, such as experts in ERMS technology, can easily understand and use them. A badly written legal section will undermine the credibility and usefulness of the whole standard. Lawyers who draft such legal sections of standards must keep in mind that such experts’ reports

Discovery Counsel at Borden Ladner Gervais in Toronto.

61 Such errors of law are, for example: (1) references to the wrong section of the Canada Evidence Act; (2) confusion between the rules concerning “authenticity” and those concerning the “integrity” of an electronic record (being the word used in s. 31.2(1)(a) of the Canada Evidence Act in relation to the “best evidence rule”); and, (3) confusion between the hearsay rule and the best evidence rule. Section 31.2(1)(a) states: “The best evidence rule in respect of an electronic document is satisfied, (a) on proof of the integrity of the electronic documents system by or in which the electronic document was recorded or stored.” The Evidence Acts of most of the provinces and territories of Canada contain comparable provisions, but use the word “record” instead of “document.” See as examples: (1) s. 34.1(5),(5.1) of the Ontario Evidence Act; (2) s. 23D of the Nova Scotia Evidence Act; and, (3) s. 37.1(5) of Nunavut Evidence Act. Appendix B, (in the “Appendix B” references, supra in note 31), lists them all, including the comparable articles of the Civil Code of Quebec.

62 National Standards of Canada dealing with electronic records technology were developed by the CGSB (Canadian General Standards Board), a standards development organization (an SDO) within Public Works and Government Services Canada. CGSB is accredited by the Standards Council of Canada as a standards development organization. Certification of a draft national standard (sponsored by SDOs) as a National Standard of Canada by the Standards Council requires compliance with designated procedures-see its “operations” of the Standards Council of Canada webpage; online: <https://www.scc.ca/en/about-scc/operations>. In regard to records management see also supra notes 3, 11, 17, 31, 49, and 57, and infra note 60 and accompanying texts.

The 72.34 national standard incorporates as “normative references,” many of the standards of the International Organization for Standardization (“ISO,” an acronym used for all languages), in Geneva, Switzerland; online: <https://www.iso.org/iso/>. 

Electronic copy available at: https://ssrn.com/abstract=3378077
will often be reviewed by the legal departments of their client institutions. And such lawyers doing the drafting should be: (1) familiar with the way in which this national standard is used in the field by experts in ERMS technology serving their clients for purposes of providing certifications of compliance with the standard; and, (2) bear in mind that the purpose of such a legal section in the standard is to advise those ERMS experts; not lawyers.\textsuperscript{63} And the standard provides a “policy and practice foundation” for the work of institutional chief records managers.

After 72.34-2017 was declared to be a national standard on March 1, 2017, by the Standards Council of Canada, an Amended Version, subtitled, “Amendment No. 1, October 2018,” was published in October 2018. The Amended Version of 72.34-2017 presents substantial changes to the list of people on the drafting committee who are alleged to have voted to send the final draft to the Standards Council to be approved and declared a National Standard of Canada. Changing the Voters’ List means changing the people declared to have done the drafting. We must ask, who in fact drafted this National Standard of Canada?

A national standard is to be the product of a consensus of a technical committee of experts. Six names were dropped from the Voters’ List—they do not appear in the Amended Version. Did those six people in fact vote? And four new names have been added to the Voters List—they are not part of the Voters’ List in the original version. That means that a significant part of the drafting committee was not part of the whole drafting process. Those people would not have the knowledge gained by the several drafts of this standard produced on the way to the final draft. They would have insufficient knowledge as to why the standard is worded as it is if they are to be considered to be knowledgeable voters. The subject matter of this national standard involves complex technology. Cursory, limited knowledge of the drafting history of this standard should not qualify anyone to be a voter. And we must ask, were the six names dropped because in fact, they didn’t vote? An improperly conducted vote by a standards development organization (an SDO) such as CGSB, could render a standard invalid and unusable. My message of December 13, 2018, asking these

\textsuperscript{63} All of the various types of work done by ERMS experts for clients begin with such certifications of compliance with the 72.34 standard. That in itself requires the application of 265 tests arising from the standard, which become the subject matter of the expert’s report, which in turn becomes the basis of an “action plan” formulated with the client as to curing the defects found in the client’s ERMS. The report not only lists the degree of compliance revealed by each of the 265 tests, but also the degree of risk to the performance of the system if each of the designated defects is not corrected. In my experience, all ERMSs contain some serious defects.

A more demanding contract of service would be for example, to meld together two very large, different, and complex ERMSs, as would be required by a merger or acquisition between or among organizations. That begins with the repair and certification of compliance by each system separately because it is much easier to meld together two “clean” ERMSs. Depending upon size and complexity of the component systems, such work may take weeks to months, and produce a very large final report. My part is to provide a legal opinion stating that if the recommended repairs (“fixes”) are carried out, there will be no known reason why the client’s ERMS cannot satisfy the records requirements of legal procedures such as, discovery, disclosure, and admissibility proceedings, plus the records and records management requirements of various major laws, and the requirements of the legal section of the 72.34 standard itself. In regard to records management see supra notes 3, 11, 17, 20, 49, 56, and 59 and accompanying texts.

Electronic copy available at: https://ssrn.com/abstract=3378077
questions, produced the following response on December 13, 2018, from CGSB’s Acting Manager of its Standards Division:

You are correct that there were membership updates made between the 2017 edition of CAN/CGSB-72.34 and the Amendment in 2018. Membership on CGSB’s Committees is fluid and constantly being updated. I would draw your attention to the fact that membership is held by the organization and not the individual and, because of this, organizational representatives do change from time to time.

Two changes were, therefore, made to the membership in the time period between the New Edition and the Amendment being published. The Technical Committee went from 23 to 21 members. One organization resigned and the other stopped responding and was, therefore, removed. All other changes were in representative names only and not organizations.

But I received no answer to my question as to whether all voters listed in the original published edition of 72.34-2017, when it was declared to be a National Standard of Canada on March 1, 2017, in fact voted.

With members of the drafting committee coming and going in such a loose and unregulated fashion, users of a national standard cannot have complete confidence in its quality. Committee membership allowed to be organizational membership instead of membership by known individuals, makes very variable and uncertain the quality of the membership and the drafting. And, the qualifications of the persons who do the actual drafting are not revealed, neither in the published standard nor to the committee members themselves. Clearly the process of “voluntary standardization,” created by the Standards Council of Canada Act for creating national standards, must be made to be more competent and professional. That is particularly so because of the increasing importance and use of national standards, and these four facts:

1. The more that laws and the production of evidence are based upon technology, especially complex technology, the greater is the need for national and international standards;

2. The greater the complexity of any technology, the greater are the ways in which it can break down or otherwise perform inadequately;

3. Therefore, the greater is the need for laws and regulations controlling the manufacture, use, and maintenance of national standards; and,

4. Therefore, the more that society is dependent upon complex technology, the more that legal proceedings will have to deal with more issues of law and fact, and the more time they will have to take, and therefore the more expensive they will be.

Pay that price or don’t use the technology!

Because of the lack of disciplined accountability and quality control procedures in the process by which National Standards of Canada are created, at the least, detailed affidavits should be required from: (1) an

SDO’s personnel that have been associated with any standards-drafting project; and, (2) from the SDO’s chief executive officer, as to the carrying out of all required procedures, and the performance of all requirements of the Standards Council of Canada in the drafting of national standards. This suggestion was ignored by the Council.

As to experts in ERMS technology providing certifications of compliance with the 72.34-2017 standard, its history of creation presents a very difficult problem for such experts.


The purpose of this section is to exemplify a recently added importance to Canada’s national standards. Dependent upon the process for creating national standards will be the federal government of Canada’s “Budget 2017” creation of Innovation Canada, “to help Canada realize its potential as a global leader in innovation.” It will require the creation of national standards with which to give its policies and practices the highest authority. Even more efficient would be the Standards Council of Canada’s accrediting Innovation Canada as a standards development organization itself (as an SDO). That would give it greater power over the subject matter of the national standards it determines to be necessary, particularly so for promoting the preservation of that intellectual property (IP) that is data, i.e., databases of “intangible property for the knowledge economy.”

The federal government’s “Budget 2017’s” Fact Sheet, Skills, Innovation and Middle Class Jobs, states in part—I quote from the following paragraphs, in regard to: (1) helping “Canada realize its potential as a global leader in innovation”; (2) establishing Innovation Canada; (3) accelerating innovation through “superclusters” of innovators, such as Silicon Valley in California; and, (4) supporting Canadian Innovators through venture capital:

Budget 2017’s Innovation and Skills Plan advances an agenda to make Canada a world-leading centre for innovation, to help create more good, well-paying jobs, and help strengthen and grow the middle class.

... 

Budget 2017 proposes to establish Innovation Canada, a new platform that will help to consolidate and simplify dozens of innovation programs situated across many departments. This will make it easier for Canadian innovators to access and benefit from Government-led innovation programs, reducing legwork and paperwork, providing more timely and relevant access to services, and ultimately putting more money in the hands of Canadian innovators to grow their businesses and create jobs. The Government will initiate a whole-of-government review of business innovation programs to ensure they are effectively geared to

65 See this Standards Council’s webpage: “SCC Accreditation Program for Standards Development Organizations”; online: <https://www.scc.ca/en/accreditation/standards>. See also infra notes 44-48 and accompanying texts. This text emphasizes, “safeguarding Canadian interest as the basis for the development of standards by SDOs” (standards development organizations).
support Canada’s innovators in turning their ideas into thriving businesses.

Clusters—dense areas of business activity that contain large and small companies, post-secondary institutions and specialized talent and infrastructure—energize economies and act as engines of growth. They create jobs, encourage knowledge sharing, drive business specialization and help to attract “anchor” companies from around the world. Successful clusters like the ones in Silicon Valley, Berlin, Tel Aviv and the Toronto-Waterloo corridor contribute significantly to both regional and national economies.

Budget 2017 proposes to invest up to $950 million over five years, starting in 2017–18, to be provided on a competitive basis in support of a small number of business-led innovation superclusters that have the greatest potential to accelerate economic growth. The competition will launch in 2017 and focus on superclusters that enhance Canada’s global competitiveness by focusing on highly innovative industries such as clean technology, advanced manufacturing, digital technology, health/bio-sciences, clean resources and agri-food, as well as infrastructure and transportation.

The TV Ontario (TVO), program “The Agenda,” with moderator Steve Paikin, on October 25, 2017, entitled, “Canada’s Future Depends on IT,” discussed these federal budget commitments. The program’s webpage summary states:

About this Video [36:47 minutes long]
The innovation economy. The knowledge economy. No matter the name, it's very likely the future economy. While Canadians are eagerly jumping into high innovation sectors, such as information technology and advanced manufacturing, there are indications that those efforts aren't paying off, particularly because intellectual property is not being nurtured. The Agenda discusses innovation with experts in the field.

The discussion’s panelists were: (1) Professor Giuseppina D’Agostino, the Founder and Director of “IP Osgoode,” the Intellectual Property Law and Technology Program at Osgoode Hall Law School, York University, Toronto; (2) Professor Dan Breznitz, Co-Director of the Innovation Policy Lab Munk Chair of Innovation Studies, at the Munk School of Global Affairs, University of Toronto; “…known worldwide as an expert on rapid-innovation-based industries and their globalization…”; and, (3) Dan Ciuriak, a Centre for International Governance Innovation (CIGI) Senior Fellow; one part of his expertise being intellectual property rights and domestic innovation.

At minute, 25:12 of the panel discussion video, Dan Breznitz states: “… changing the rules of the game; through the Standards Council of Canada; through our organization in Ottawa, we can actually start to have an international voice about how you govern IP, and we have to, ….”

The Standard Council of Canada’s, Annual Report 2016-2017, Delivering Through Innovation, dated October 24, 2017 (52 pages), shows that it will be a critically important partner in the work of Innovation Canada. At p. 2 are these statements:

Our Mission: To lead and facilitate the development and use of national and international standards and accreditation services in order to enhance Canada’s competitiveness and
well-being.

Our Vision: To be a global leader driving prosperity and well-being for Canada through innovative standardization solutions.

And at p. 4 there is a, “Message from the Chair and the CEO,” which states in part:

Standards are critical to almost every product and service we use. … By partnering with Canadian businesses, research institutions, and key industries to identify the areas where our nation’s innovators have unique expertise, we can help them develop standards that tap into that expertise—and they can deliver their innovative products and services to the world.

And at p. 16 is this statement: “There are approximately 5,000 references to standards in Canadian federal, provincial and local regulations.”

Innovation Canada will rely upon the Standards Council to declare the national standards it needs to give its declared policies and procedures, etc., the highest authoritative status—the status of a text declared to be a National Standard of Canada by an independent agency serving that standards-creation purpose. In contrast, industry standards may be published by the industries themselves, to serve the subjective choices of the authoring industries—there isn’t the same authority of independent, impartial declaration by a specialized standards-creating agency. To be an SDO itself, Innovation Canada would have to be accredited by the Standards Council as such.

For either purpose of standards-creation or standards-sponsoring, organizations such as Innovation Canada will be heavily dependent upon the Standard Council of Canada’s ability to impose quality-control, safe-guarding procedures upon the SDOs, such as CGSB, that sponsor the drafting of the standards that they wish the Council to declare to be National Standards of Canada. The Standards Council is the “public face” of the standards creation process, and therefore accountable, in the first instance, for their quality and for the quality-control exercised in their creation.

And now for 2019, the federal government is elevating and generously funding the Standard Council’s importance and prominence, and consequentially, the importance of CGSB as a standards development agency, because managing the drafting projects for the necessary standards that Innovation Canada will need to be created will fall within CGSB’s jurisdiction as an accredited standards development organization by the Standards Council.

On April 10, 2018, the Standards Council sent out the following message (the Standards Council of Canada refers to itself as, “the SCC,” regardless that the Supreme Court of Canada is an older institution). Note: (1) how important a place the Standards Council’s message gives to itself within, “the Government

66 And the Standards Council of Canada’s 2017-2018 Annual Report (online: <https://www.scc.ca/en/annual-report-2017-2018-landing-page>), contains an extensive description of the many legislative and policy development areas in which national standards are referred to in regulations enacted by way of the regulation-making powers contained in such legislation. See supra note 39 and accompanying text.
of Canada’s Innovation and Skills Plan”; and, (2) the close and important connection between innovation and “standardization strategies to drive innovation” (inter alia, the development of national standards):

Introducing SCC’s Innovation Program / Présentation du programme d’innovation du CCN

Is your SCC mirror committee67 working on proposing a new work item with companies that have:

- A history of growth;
- A capacity and willingness to grow;
- A strong management team;
- A focus on export markets;
- A focus on innovation;
- A standardization gap where when filled would produce sustained company growth; or
- A willingness and ability to invest time and resources in supporting the standardization activity?

We want to hear from you. A dedicated SCC advisor will work with you and the appropriate mirror committee to assess the opportunity and determine the appropriate level of SCC support to help grow your business.

Supporting the Government of Canada’s Innovation and Skills Plan

As part of Budget 2017, the Government of Canada introduced the Innovation and Skills Plan with an aim to accelerate the country's economic growth and to create good, well-paying jobs. The Plan highlights the value of standards-setting in advancing Canada's economic interests linked to growing globally successful companies. The Standards Council of Canada (SCC) has received $14.4M over five years to develop and advance standardization initiatives that will benefit Canadian innovators, enhance market access and create new middle class jobs.

SCC is working closely with leaders from within Canada's existing innovation ecosystem (e.g. Innovation, Science and Economic Development Canada (ISED)68 Sustainable Development Technology Canada (SDTC), Canadian Council of Innovators, etc.) to identify high-potential companies whose technologies, products, platforms, processes and/or services can benefit most from some form of standardization activity. Through early identification and active leadership in standards development, Canadian innovators can ensure early market access, influence and adoption of new technologies.

By working directly with Canadian innovators, SCC is providing tailored, end-to-end support to eligible companies in developing effective standardization strategies to drive innovation, accelerate the commercialization and adoption of Canadian innovations, and create a global market advantage for Canadian businesses. Activities include:

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67 A national mirror committee (NMC) is a, “National structure set up to mirror the work of an ISO Technical Committee within a National Standards Body [such as the Standards Council of Canada]. The NMC brings together stakeholders to establish a national consensus position on the work.” The ISO is the International Organization for Standardization in Geneva, Switzerland. (“ISO” is the commonly used acronym in all languages, regardless the differing order of the words in its title as stated in different languages.) In regard to records management see supra notes 3, 11, 17, 31, 49, 56, and 59, and infra note 63, and accompanying texts.

68 The Standards Council of Canada reports to Parliament through the Minister of Innovation, Science and Economic Development. Oversight is provided by the Council’s Governing Council which approves the strategic direction of the organization. See also supra notes 43 and 44, and infra notes 47 and 48 and accompanying texts. In regard to records management see supra notes 3, 11, 17, 31, 49, 56, 59 and 60, and accompanying texts.
• Identifying the most promising innovations that would benefit from standardization;
• Building the case internationally as to why Canada should be entrusted with leadership in developing the relevant standards;
• Actively participating in standards setting activities to bring advanced skills home to Canada and into Canada's standardization network;
• Garnering support from key standardization allies to obtain approval for new work item proposals;
• Selecting and supporting credible Canadian innovators to be elected as leaders of relevant technical committees or working groups in order to manage and guide the standards drafting process;
• Seeking to embed Canadian intellectual property, platforms or approaches in standards where appropriate;
• Designing supportive international certification and accreditation programmes to facilitate international market access and regulatory compliance once standards are published; and
• Engaging Canadian regulators to ensure new standards supporting Canadian innovations are referenced in relevant federal, provincial and territorial regulations, as well as in procurement where appropriate.

Link to Existing SCC Programs

SCC administers upwards of 490 National Mirror Committees to ISO [the International Organization for Standardization] and IEC [the International Electrotechnical Commission], accredits nine Canadian Standards Development Organizations and engages numerous national standards bodies, provides accreditation services, and continually enters into new work in areas of emerging priority to an evolving standardization system.

This means that supporting Canada's Innovation and Skills Plan has direct links into the programs that make up the core mandate of SCC, and provides new opportunities to promote and expand Canada’s standardization network.

How to Get Involved

The Standards Council of Canada is continually seeking new innovative technologies, products, and/or services where Canadian stakeholders directly benefit from standardization solutions.

Please contact Alec Clark, Manager, Innovation and Regional/International Engagement (alec.clark@scc.ca, 613-238-3222 ext. 404) or Keith Jansa, Manager, Strategic Policy and Sector Engagement (kjansa@scc.ca, 613-238-3222 ext. 490) to learn more and to share your ideas.

As required by the regulations created by the Standards Council itself, national standards are to be created at arm’s length from government, and to serve the public interest, not government interest.69 Each

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69 See the Standards Council’s text, Requirements & Guidance – Accreditation of Standards Development Organizations 2017-04-05; online: <https://www.scc.ca/en/about-scc/publications/exigences-et-procedures-accreditation/requirements-guidance-accreditation-standards-development-organizations>. This text emphasizes, “safeguarding Canadian interest as the basis for the development of standards by SDOs” (standards development organizations). This text is based upon the Standards Council of Canada Act, which creates the Standards Council of Canada, and the process of “voluntary standardization”; (“voluntary,” means that the members of the technical drafting committees are not paid for their participation. That creates a very difficult “time-availability” problem, particularly
of the ten standards development organizations (SDOs)\(^70\) has its own separate jurisdiction as to subject matter for creating draft National Standards of Canada (NSCs). The drafts are submitted to the Standards Council to be declared NSCs. SDOs convene technical committees of experts to draft NSCs. Therefore, the Standards Council is not responsible for the content of NSCs, and SDOs are sponsoring agencies only, not themselves expert in the subject matter of any draft national standard that they submit to the Standards Council. But it is assumed, that the Standards Council is responsible for ensuring that a draft standard was created by means of the required procedures—procedures within the provisions of an SDO’s terms of accreditation as an SDO as granted by the Standards Council of Canada.

Innovation Canada, and all of the government’s promotion of innovation for “the knowledge economy,” will have to depend upon CGSB to sponsor the drafting of the national standards that it needs to promote the preservation and monetizing of IP as valuable property.

But CGSB’s performance in the 72.34-2017 drafting project might eventually limit the credibility of any standards-creation projects that it sponsors.\(^71\) As well, the integrity of the Standard Council’s exercise of its powers of declaring the draft national standards submitted to it by the ten accredited standards development organizations\(^72\) such as CGSB, to be national standards, might be equally jeopardized.

And so, the Standards Council’s functions are being made essential to the federal government’s “Innovation Skills Plan,” and the sponsoring of the drafting of the necessary national standards will fall within CGSB’s jurisdiction as to its particular field of information technology (\textit{i.e.} to gather together the drafting “technical committees” of experts).\(^73\)

Given the above substantial commitments of the federal government so publically and prominently made, no agency or representative of the federal government can now create the appearance of its being able to conduct an impartial, objective inquiry into: (1) the creation of the 72.34-2017 national standard; so for a large committee, which is necessary to demonstrate adequate representation.) The text emphasizes that the Standards Council of Canada’s “policies and operations are managed at arm’s length from government,” and that national standards are developed to serve “Canadian needs,” and the “Canadian interest”; not government needs and interests. Therefore s. 4(2) of the Standards Council of Canada Act provides for government representation and participation on standards drafting committees, but it does not provide for government control. See also supra notes 44-48 and accompanying texts.


\(^71\) See supra notes 17, 60, and 64, and accompanying texts.


\(^73\) The importance of Canada’s national standards, and the performance of the Standards Council, and of CGSB, make clear that the system for creating national standards must be substantially revised, and the Standards Council of Canada Act amended accordingly.

Electronic copy available at: https://ssrn.com/abstract=3378077
(2) the necessary competence that the Standards Council and CGSB must have; and, (3) the integrity and viability of Canada’s national standards creation process, including the efficacy and integrity of the process of accrediting SDOs such as CGSB, and the quality control of their performance thereafter.

Our lives are already more dependent upon the many applications of electronic technology to the use of information and data than they are dependent upon motor vehicles. However, the manufacture of motor vehicles is highly regulated, while such applications of electronic technology have almost no legal infrastructure to control their development, manufacture, use, and maintenance. Because of the complexity and wide and intense use of electronic technology, the legislation and regulations necessary will have to be made very dependent upon national standards yet to be created. The Standards Council of Canada as it presently is, will be in charge of that standards-creation process, as will CGSB be administering the drafting process, in spite of its very poor performance in creating the 72.34-2017 National Standard of Canada, *Electronic Records as Documentary Evidence*.

7. SOFTWARE ERRORS AND VULNERABILITIES ARE VERY PREVALENT AND COSTLY

In addition to the prevalence of such serious (but ignored) errors in records management, are the numerous errors in the software that all ERMSs and other electronic systems and devices depend upon. Many such records systems operate by way of several millions of lines of software code, and it has an error rate, as do most things created by people. For example, the Windows 3.1 operating system has close to 3 million lines of software code. The Google Chrome web browser has approximately five million lines. The Firefox browser is near 10 million, and Windows 7 has just under 40 million lines of code, which is a little less than Windows XP, and more than 10 million less than Windows Vista. And an Android phone has more than 12 million lines of code.

In 2002, a study commissioned by the U.S. Department of Commerce’s National Institute of Standards and Technology (NIST) concluded that, “software errors cost the U.S. economy $59.5 billion annually.”74 Their report states in part (including quotations):

> Software bugs, or errors, are so prevalent and so detrimental that they cost the U.S. economy an estimated $59.5 billion annually, or about 0.6 percent of the gross domestic product, according to a newly released study commissioned by the Department of Commerce’s National Institute of Standards and Technology (NIST).

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74 The article concerning this NIST report can be accessed online: <https://www.nist.gov/>. NIST is “a non-regulatory agency of the U.S. Department of Commerce’s Technology Administration, NIST develops and promotes measurement, standards, and technology to enhance productivity, facilitate trade and improve the quality of life.” That summary ends with this statement: “Electronic copies of NIST Planning Report 02-3, The Economic Impacts of Inadequate Infrastructure for Software Testing, can be obtained from http://www.nist.gov/director/prog-off/report02-3.pdf. (To read these files, you can download Adobe Acrobat Reader free.) Paper copies can be requested by e-mail from dherbert@nist.gov (refer to the title or Planning Report 02-3).”
At the national level, over half of the costs are borne by software users and the remainder by software developers/vendors. The study also found that, although all errors cannot be removed, more than a third of these costs, or an estimated $22.2 billion, could be eliminated by an improved testing infrastructure that enables earlier and more effective identification and removal of software defects. These are the savings associated with finding an increased percentage (but not 100 percent) of errors closer to the development stages in which they are introduced. Currently, over half of all errors are not found until "downstream" in the development process or during post-sale software use.

NIST funded the study, which was conducted by the Research Triangle Institute (RTI) in North Carolina, as part of a joint planning process with industry to help identify and assess technical needs that would improve software-testing capabilities. Findings of the 309-page report are intended to identify the infrastructure needs that NIST can meet through its research programs.

"The impact of software errors is enormous because virtually every business in the United States now depends on software for the development, production, distribution, and after-sales support of products and services," said NIST Director Arden Bement. "Innovations in fields ranging from robotic manufacturing to nanotechnology and human genetics research have been enabled by low-cost computational and control capabilities supplied by computers and software."

In 2000, total sales of software reached approximately $180 billion, supported by a large workforce encompassing 697,000 software engineers and 585,000 computer programmers.

Software is error-ridden in part because of its growing complexity. The size of software products is no longer measured in thousands of lines of code, but in millions. Software developers already spend approximately 80 percent of development costs on identifying and correcting defects, and yet few products of any type other than software are shipped with such high levels of errors. Other factors contributing to quality problems include marketing strategies, limited liability by software vendors, and decreasing returns on testing and debugging, according to the study. At the core of these issues is difficulty in defining and measuring software quality.

The increasing complexity of software, along with a decreasing average product life expectancy, has increased the economic costs of errors. The catastrophic impacts of some failures are well-known. For example, a software failure interrupted the New York Mercantile Exchange and telephone service to several East Coast cities in February 1998. But high-profile incidents are only the tip of a pervasive pattern that software developers and users agree is causing substantial economic losses.

Thus, if all software bugs could be identified and removed instantly (in real time), the combined economic benefits to the two industry groups and to the economy would be $5.85 billion and $59.5 billion, respectively. Realizing that such a "perfect infrastructure" is not attainable, industry experts were asked for estimates of a plausible reduction in delayed identification and removal of software errors. Based on this information, a "feasible improved infrastructure" scenario was constructed. For this scenario, software developers were asked to estimate the potential cost savings associated with enhanced testing tools, and users were asked to estimate cost.
savings if the software they purchase had 50 percent fewer bugs and errors. This improved infrastructure scenario is estimated to result in a combined annual benefit of $2.10 billion to the two industry groups studied, and $22.2 billion to the U.S. economy.

Next Steps
The path to higher software quality is significantly improved software testing. Standardized testing tools, suites, scripts, reference data, reference implementations and metrics that have undergone a rigorous certification process would have a large impact on the inadequacies currently plaguing software markets. For example, the availability of standardized test data, metrics and automated test suites for performance testing would make benchmarking tests less costly to perform. Standardized automated testing scripts, along with standard metrics, also would provide a more consistent method for determining when to stop testing.

Therefore, the untested “assumption of reliability and regularity” that is applied to the use of electronic systems and devices dependent upon software is unjustified and dangerous. All devices, electronic or otherwise, must be assumed to be prone to error to some degree, such that the evidence they provide should not be accepted as reliable unless there is expert opinion evidence, or other form of authoritative certification of their reliability. An example of “authoritative certification” is Criminal Code s. 258, which authenticates the blood-alcohol content (BAC) readings produced by breathalyzer devices as being reliable evidence.

But the software in breathalyzer devices most often used in Criminal Code impaired driving and “over 80” prosecutions (Criminal Code s. 253), which one would assume would have to be more reliable than that in most other electronic devices, nonetheless has a significant error rate. Consider the following published quotation in reference to the software in a particular make and model of breathalyzer machine:

On average, 25 software defects exist for every 1,000 lines of code.

If the number of lines of code in the source code can be ascertained, the industry averages can be applied to estimate the number of defects. The estimated number of defects is calculated by multiplying the number of lines of code by 25, and dividing that product by 1,000.

The number of lines in the source code has been disclosed in testimony for the Draeger 7110 device, which has 53,774 lines of code that print out on 896 pages. Applying the

75 Supra note 40 and, infra notes 79-84, and accompanying texts.

formula that utilizes the industry average, it is reasonable to expect 1,344 defects in the software for the Draeger 7110, if it conforms to the industry norms and is “average”.

And such breathalyzer readings could be relevant evidence in any civil or criminal proceedings. There is however, a “safeguarding procedure” required to be performed by Criminal Code s. 258(1)(g)—testing the breathalyzer device with a solution of alcohol of a known concentration immediately before testing the suspect. However, this safeguard applies only in relation to the offences in Criminal Code s. 253—impaired driving and “over 80” (see the reference in Criminal Code s. 258(1)(g) to s. 254(3)). But are there any other comparable commonly used, expressly dictated procedural safeguards for other technology-based sources of evidence? That is another reason why national and international standard are important—to specify and dictate the use of such safeguards. Having them so stated in such authoritative texts: (1) greatly encourages using them; (2) facilitates enforcing them; and; (3) increases the persuasiveness of lawyers advising their clients to use them and the standards that contain them.

Such software error rates do not make inevitable the production of faulty evidence. The error rate indicates a probability of faulty performance, which is rare in most late model electronic systems and devices, depending upon the quality of the software and systems maintenance, and is decreasing as the technology improves. But that does not relieve counsel from evaluating the need to challenge the reliability of all sources of evidence.

Another example of unexpected unreliability in a much used and “faithful” electronic device is provided in this news story: “Xerox scanners/photocopiers randomly alter numbers in scanned documents.” Also of concern is the current frequency of “hacking” into everything electronic, for example, this article: “Why Apple’s Recent Security Flaw is Scary.”

Even though not accessed for long periods, records in electronic storage are often moved around by the computer’s operating system itself, to make room for other records. On most simple systems it is not moved, but on most complex systems it is moved so as to obtain better storage organization by “defragging,” i.e., resolving the fragmentation of the data that makes up a record. It is faster for the operating system to read consecutive blocks of data on a hard-drive rather than scattered blocks caused by holes left by deletions of other files. So periodically hard-drives are “defragged” so as to reorganize files into contiguous sets of blocks of data. Late model operating systems do this automatically. However, errors in the file system source code can destroy data. There is a possibility of a one bit (of data) error rate on a hard-drive of 10 terabytes. Every time data is copied, there is a very small possibility of data loss or modification. But server

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77 Online: <http://www.dkriesel.com/en/blog/2013/0802_xerox-workcentres_are_switching_written_numbers_when_scanning>.


Electronic copy available at: https://ssrn.com/abstract=3378077
operating systems should have “check-summing” to counteract that. Without “check-summing” the blocks of data, the natural error rates of hard-drives present a risk. Hard-drives have natural error rates of 1 in \(10^{12}\) bits; the highest end server drives (the better ones), 1 in \(10^{15}\) bits. Errors can be reduced by using mirrored drives, \textit{i.e.}, writing everything to two hard-drives at once. Periodic checks are carried out to make sure the drives match. Errors (mismatches) thus discovered can be corrected from backups.

The “operating system” is the underlying program that controls and runs all of the other applications on a computer. Windows and Unix (and its many variations) are operating systems. Most personal computers are shipped with a Windows operating system pre-installed, but some companies will install Linux instead.

The “kernel,” such as the \textbf{Linux kernel},\footnote{See the Wikipedia description of the \textbf{Linux kernel}, online: \url{https://en.wikipedia.org/wiki/Linux_kernel#Lines_of_Code}.} is the basic code (computer language) and structure that powers the entire operating system. Early Linux operating systems were prototypes, primarily used by designers and engineers. But many of them have developed into products that are used by a growing number of consumers.

“Source code” is the instructions given to the computer by a program for the computer to translate and execute. It is the programming software language that the developer uses to tell the computer what to do when a user issues a command by way of the keyboard.\footnote{See also the definition of “source code,” in \textit{supra} note 10 and accompanying text.}

But the ability to detect the implanting of malicious software is very poor. The, “Trojan horse defence” is used against accusations of illegal materials (such as possession of child pornography) found stored in a computer. It argues that a malicious program, secretly contained within an obtained acceptable program was the cause of the implanting.\footnote{See: Miha Sepec, “\textbf{The Trojan Horse Defence-A Modern Problem of Digital Evidence}” (2012), 9 Digital Evidence and Electronic Signature Law Review 58, at 61 (pdf); online: \url{http://journals.sas.ac.uk/deeslr/article/view/1990}.}

I have been told by knowledgeable computer technology experts that approximately 95% of the messages that we receive from the producers of the software that we use, as to so-called “updates,” using phrases such as, “an update has been installed, please re-start your computer,” are in fact corrections to software source code errors. Some corrections are accompanied with new features, or the removal of old features. Removing features reduces maintenance and overhead costs, and can sometimes also serve to simplify the UI (the “user interface,” thereby making it easier for new customers). And some “corrections” augment a feature’s paid version and hobble its free version. Features are sometimes removed because they are no longer used, because there is a cost to maintaining an unnecessarily large features set.

Most of the evidence now used in legal proceedings and for legal services comes from complex
electronic systems and devices. But because of ignorance of technology in general, due mainly to their education, lawyers don’t challenge the reliability of such sources of evidence. As a result, computers, software, and computer storage, are dealt with as though they are infallible producers of evidence. As a result, so does the law.

The development of law by way of the analysis in judges’ judgments depends heavily upon the evidence and arguments presented by the lawyers who appear before them. Judges cannot obtain their own evidence. The purpose of a judge is to settle disputes and not to establish or teach unassailable truths and realities. So theoretically, if both the plaintiff’s and defendant’s lawyers believe that the Sun revolves about the Earth, the judge must decide the case on that basis. However, that rule is not as strictly applied in criminal cases, or in any case wherein there is an additional “public interest” factor in the outcome. The judge could tell the lawyers to learn some very basic astronomy about the Solar System and the daily rotation of the Earth.

The same should apply in regard to ignorance of computers and their vulnerability to errors. And so, the same should apply to the evidence provided by electronic discovery in civil proceedings, and disclosure in criminal proceedings, i.e. information should be made available as to the state of the management of the parties’ electronic records management systems or other systems and devices that produce the evidence being considered. Also, that is what a preliminary inquiry should provide—an opportunity to explore. Therefore, current Bill C-75 (as of March 22, 2019), should be expanding the right to a preliminary inquiry instead of abolishing it for all offences except those providing life imprisonment as a potential penalty.

8. THEREFORE, SOFTWARE IS TRUSTED FAR TOO MUCH

In regard to all such software-based systems and devices, here are cautions about software that are repeated in several different ways:

… Incorrect decisions can be made because of ignorance of how vulnerable software is to being biased or manipulated, or when software fails because of an error that the owner of the software cannot necessarily replicate. This means that it is necessary to

82 And therefore, legal precedent should be developed only within the factual context of a trial, rather than within a factual vacuum of an earlier stage of the proceedings, Coriale v. Sisters of St. Joseph, 1998 CanII 14695 (ONSC), (1999), O.R. (3d) 347 at 359, citing as authority, Nelles v. Ontario, 1989 CanII 77 (SCC), [1989] 2 S.C.R. 170, at 216-218, concerning whether the Attorney General and Crown Attorney have immunity from a civil suit for malicious prosecution. The Court held that the matter should not be decided on a preliminary motion and therefore sent the matter on to trial.

83 See: Stephen Mason, (1) “‘Trust’ Between Machines? Establishing Identity Between Humans and Software Code, or whether You Know it is a Dog, and if so, which Dog?”, 2015 Computer and Telecommunications Law Review, Volume 21, Issue 5, 135 – 148 (with Timothy S. Reiniger); at 138; and, (2) “Artificial Intelligence: Oh Really? And Why Judges and Lawyers are Central to the Way we Live Now—But they Don’t Know it” (2017), 23 Computer and Telecommunications Law Review, Issue 8, 213-225; at 222: “… The computer industry is fully aware that software code is full of errors, yet when locked into litigation, commercial organizations will go to extreme lengths to prevent the other side from being given sight of the evidence.” In regard to software see supra notes 40 and 74, and accompanying texts.
consider “what is being trusted, how it is being trusted, and by whom”. [footnote omitted]

… … …

… Because software is both complex and imperfect, machines are vulnerable to causing errors that the writer [of the software] did not envisage.

The frequency of errors in ERMSs, and in their software, make authoritative standards of critical importance. Most interactions among people that are not of a casual or informal nature now produce electronically made and stored records and are dependent upon the performance of software. Any record can become a piece of evidence used in a legal proceeding or legal service. And as we become even more completely dependent upon electronic technology, records management system’s compliance with authoritative standards will have to become mandatory. Stephen Mason sites this example:84

The reluctance of judges to order disclosure is also significant, given the rules that permit business records to be automatically granted admission into legal proceedings without the need for authentication. Such rules are, in the age of software code, out-dated. They refer to a period of time when records were recorded on paper. Now that the vast majority of business records are stored on digital devices controlled by software programs that are full of errors, it cannot be right to continue with permitting organizations—both government and commercial—to benefit from a rule that no longer applies to modern working practices. The attitude of organizations also demonstrates that their assertions, based on their electronic records, need to be the subject of careful scrutiny by the courts, and the evidence of employee witnesses has to be treated with great care.

For comparison, imagine the use of motor vehicle technology without the strict application of its present legal infrastructure of laws, regulations, courts, judges, police forces, government departments, roads and highways, motor vehicle insurance companies, and lawyers, etc. It is a technology that doesn’t stop increasing the necessary legal infrastructure to control it and its creation of, and dependence upon national and international standards. Nevertheless, automobile manufacturers are much burdened with “recalls” of millions of motor vehicles every year due to defects in their manufacture. We are already more dependent upon electronically produced records than we are upon automobiles. But it is much more difficult to be made aware that the ERMSs that are the sources of records are performing inadequately than it is in regard to the performance of motor vehicles. When cars and trucks fail or “act up,” we know about it immediately. Not so with electronic systems and devices. They don’t so forthrightly and fairly tell us of their problems. So, precautions, warnings, and safeguards are if anything, more necessary.

Four comparable Canadian examples that allow the use of records without proof of the reliability of

84 Ibid. (2) “Artificial Intelligence: Oh Really? And Why Judges and Lawyers are Central to the Way we Live Now—But they Don’t Know it” at 223. (As a footnote, Stephen Mason sites Chapter 7, “Authenticating Evidence,” of his book, Electronic Evidence 4th ed. (2017), which can be downloaded, online: <http://stephenmason.co.uk/books/electronic-evidence> See also supra note 2, and infra notes 86-88, and accompanying texts.
their ERMSs are:

(1) section 30 of the Canada Evidence Act (CEA) and its provincial and territorial Evidence Act counterparts;

(2) the “proportionality principle,” Principle 2 of the Sedona Canada Principles (2d ed., November 2015), pp. 16-21, because it lacks a disqualification of a “disproportionality” objection to applications for further disclosure when the alleged disproportionality is caused by the opponent’s own bad records systems’ management;

(3) ignoring the “systems integrity” concept stated in s. 31.2(1)(a) of the CEA and in its provincial and territorial Evidence Act counterparts; and,

(4) the Sedona Canada Principles requirements imposed upon electronic discovery in civil proceedings, do not apply to, or have counterparts applicable to, disclosure in criminal proceedings, even though the evidence used in all legal proceedings comes from the same kinds of electronic systems and devices.

And the transition to electronic records technology from paper records technology has happened far more quickly than the transition to motor vehicles from mass transportation dependent upon horses. As a result, the necessary regulating legal infrastructure is far behind in its needed development. The use of electronic records and their ERMSs will create a need for an even bigger and more complex legal infrastructure based upon authoritative standards. But standards have to be enforced, and like laws, the efficacy of their enforcement depends upon the quality of their content, and therefore upon the quality of the process that creates them. Substantial improvements are needed in the timely creation of legal infrastructure and standards by which software-dependent (i.e., electronic) systems and devices are manufactured, used, and maintained in proper operating condition, so as to facilitate the application of the rule of law that the Canadian Charter of Rights and Freedoms declares in its preamble that Canada is founded upon.

The technical literature emphasizes that the manufacturing of software is badly in need of standards. In Stephen Mason’s book there are several passages such as the following:

(6.112, p. 143): In summary, faults in software and errors relating to the design of software systems are exceedingly common.

(6.115, p. 144): Software will continue to be unreliable. By providing a general presumption of reliability to software, the law acts to reinforce the attitude of the software industry that the effects of poor quality work remain the problem of the end user.

(6.118, p. 145): Modern digital systems are so vulnerable for a simple reason: computer science does not yet know how to build complex, large-scale software that has reliably correct behaviour.

(6.105, p. 140): This weakness is now recognized by some of the organizations that produce devices and software. Microsoft and Apple are among a number of companies that have adopted a ‘bug’ bounty programme to reward professionals who test and find errors in the software. The U.S. Department of Defense has also taken this approach, as

85 Supra note 84.
has Google in respect of cryptographic software libraries.

And compare this denigration by Stephen Mason of the dangerous use of “common sense,” with the high veneration of common sense in the quotation that follows from Judge Paciocco’s article:86

(6.228, pp. 191-192): This is why lawyers and members of the judiciary need to understand two significant issues about the world in which we live now, and the reliance on modern technology. First, the evidential presumption, which is a delusion, that software code is ‘reliable’ must be reconsidered. The rationale used by judges that software code is part of a ‘notorious’ class of machines, or the operation of computers and other such devices are ‘common knowledge’ must be reversed. … yet lawyers and judges rely on ‘common sense’ when many ‘well-established principles are positively contrary to common sense. Justifications around loose notions of ‘notorious’ or ‘common knowledge’ in respect of software programs is irrational. Justice should not be based on concepts with no basis in logic or science. It is necessary for lawyers and judges to take account of this element of irrationality that has been the law for far too long. … (6.229)

Second, judges should understand the necessity of requiring the disclosure of software code and relevant audits of systems, and determine whether security standards, if applied, have been applied properly. These steps ensure that the judicial process more fully comprehends the evidential reality of software code and ‘digital systems’, and helps to preserve fairness in legal proceedings.

In sharp contrast, Judge Paciocco states of the essentially important use of common sense in relation to the application of the rules of evidence when applied to evidence produced by electronic technology:87

(p. 201): “When these provisions are given an overlay of common sense, they can perform their function unobtrusively”;

(p. 226): “As can been seen, for the most part the laws of evidence are suitable without radical transformation to cope with new technologies”; and,

(p. 228): “The law is well equipped for coping with the law of evidence in the technological age.”

All of the above quotations from Stephen Mason’s publications show a very different approach to use of evidence produced by complex electronic systems and devices than that advocated by Judge Paciocco. Apparently, his belief in the great embodied strength and durability of the rules of evidence, makes unnecessary, in preparation for writing such an article as to the application of the rules of evidence to such technology-produced evidence: (1) doing a literature search; (2) obtaining some technical advice; and, (3) considering the applicability of standards, such as for example, the National Standards of Canada concerning electronic records management systems, that were in existence at the time his article was published in 2013.88

86 Supra notes 84 and 85 and accompanying text.
87 Supra notes 2, and 49-51 and accompanying texts.
88 The following National Standards of Canada concerning electronic records management systems were operative
9. TECHNOLOGY’S EVIDENCE AND BILL C-75’s ABOLITION OF THE PRELIMINARY INQUIRY

Bill C-75 is entitled, “An Act to amend the Criminal Code, the Youth Criminal Justice Act and other Acts and to make consequential amendments to other Acts.” As to its Parliamentary history: (1) in the House of Commons, it received Second Reading on November 2, 2018, and, Third Reading on November 28, 2018 and December 3, 2018; and then, (2) in the Senate, it received Second Reading on February 19, 2019 and February 28, 2019.89

Bill C-75 proposes abolishing the preliminary inquiry for all offenses except where life imprisonment is a possibility (see: ss. 239(4)-246 amending Criminal Code ss. 535-536.1). That is a serious mistake. Removing the preliminary inquiry greatly reduces the ability of counsel to prepare for trial. Because our lives are completely dependent upon electronic systems and devices, the sources of very commonly used evidence are most often very complex. The more complex a technology, the more ways it has to break down or otherwise perform badly. Therefore, methods of checking the reliability of such sources are increasingly necessary. The preliminary inquiry is therefore becoming increasingly an essential mechanism for preparing for trial. Therefore, greatly reducing its availability will greatly increase the probability of wrongful convictions.

Most of the evidence used in legal proceedings now comes from complex electronic systems and devices. For example, records are now the most frequently used kind of evidence. Almost all of them come from large, complex electronic records management systems. They all operate on software. The technical literature emphasizes very strongly that because software has high error rates, we trust software far too much. Software has high error rates in its source code because of the circumstances under which it is manufactured, i.e., the manufacturing of a very complex product, with no legal infrastructure controlling its manufacturing, under circumstances of extreme pressure. Most electronic systems and devices are manufactured for commercial markets, whereat there is intense pressure to get one’s new system or device to market as fast as possible because the chances of success are much greater if one can beat one’s competitors to the retail market.

The argument that the preliminary inquiry can be adequately replaced by the Crown prosecutor’s duty

89 Those linked dates can be used to access the debates on the Second Reading and Third Reading of Bill C-75.
to make full disclosure of the "fruits of the investigation" is a false and dangerous argument. The police are not routinely trained about the nature of technology, its vulnerabilities, its software architecture and error rates. And can we ever leave ourselves completely reliant upon any investigator to ask all of the many necessary detailed technical questions that must be asked of the technically complex sources of evidence in order to know enough about the reliability of the evidence that they produce? For example, when looking for and recruiting an expert witness, do the police or other investigators and inspectors ask all the questions that opposing counsel might ask during a preliminary inquiry or witness discovery?

By abolishing the preliminary inquiry so as not to make available an adequate opportunity to learn about and challenge the performance of such very complex, but fallible sources of evidence, they are, in effect, treated as being infallible. They are very far from that.

We all quite regularly experience disruptions and failures when using our computers and other electronic systems and devices. We thereby know of their vulnerability and proclivity to failure and to perform frequently inadequately. Nonetheless, those who propose such amendments to criminal procedure, reduce the safeguards for detecting such failures and the corrupted performance of the electronic systems' and devices' production of evidence. There is no greater safeguard for preparing for trial and avoiding unwarranted trials than the preliminary inquiry. The fact that it is not used often enough in that way, does not justify abolishing it or even reducing its availability as does Criminal Code ss. 536.3-536.5. Because lawyers' and law students' legal education is inadequate in relation to all electronic sources of evidence, the preliminary inquiry is not used often enough to test the reliability of such sources of evidence. But will legal education soon catch up by teaching technology’s reality?

Because of the politicians' belief that, "there are no votes in justice," (there are no significant quantities of votes to be gained by spending any significant amounts of money on the justice system), they deal with problems of delay and needed modernization of the justice system by removing steps in very important procedures and generally simplifying the processing of cases through the court system. But our sources of evidence are going in the opposite direction--toward greater complexity. Therefore, the more the court system is subjected to this process of "cutting costs by cutting its competence," the less likely it is to be able to do "justice." In fact, it will significantly increase the probability of more wrongful convictions. That is very dangerous because our ability to detect wrongful convictions resulting from the inadequate testing

The expression, “the fruits of the investigation” comes from, R. v. Stinchcombe, 1991 CanLII 45 (SCC), [1991] 3 SCR 326, wherein Sopinka J., delivering the judgment of the Court, stated: “I would add that the fruits of the investigation which are in the possession of counsel for the Crown are not the property of the Crown for use in securing a conviction but the property of the public to be used to ensure that justice is done. In contrast, the defence has no obligation to assist the prosecution and is entitled to assume a purely adversarial role toward the prosecution. The absence of a duty to disclose can, therefore, be justified as being consistent with this role.” Stinchcombe 1991 CanLII 45 (SCC), now has a case law progeny of more than 2,794 texts on CanLII (as of February, 2019). See also supra note 14 and accompanying text.
of the quality of evidence is very close to zero.\textsuperscript{91} That fact is one of the justifications for the high burden of proof upon the Crown prosecutor in criminal proceedings, \textit{i.e.}, “proof beyond a reasonable doubt.”

And the unaffordable legal services problem that has left the majority of society unable to afford lawyers for anything but simple, routine legal services, should be seen as increasing the need for the preliminary inquiry.\textsuperscript{92} With more accused persons appearing in criminal courts without counsel, in proceedings increasingly based upon evidence produced by complex technology, the need is made greater for Crown counsel to demonstrate in open court before a judge that there is in fact, “a case of probable guilt” to be met, and that a trial is warranted. “Justice must not only be done, it must be seen to be done.” That should be seen as part of the duty of Crown counsel to the accused, especially an undefended accused person. That duty was first authoritatively expressed in the Supreme Court of Canada in the now classic paragraph of Rand J. in, \textit{Boucher v. The Queen}, \textbf{1954 CanLII 3} (SCC), [1955] S.C.R. 16, at pp. 23-24, as to the duty and motivations of Crown counsel—“the Crown never wins and the Crown never loses”:

It cannot be over-emphasized that the purpose of a criminal prosecution is not to obtain a conviction, it is to lay before a jury what the Crown considers to be credible evidence relevant to what is alleged to be a crime. Counsel have a duty to see that all available legal proof of the facts is presented: it should be done firmly and pressed to its legitimate strength but it must also be done fairly. The role of prosecutor excludes any notion of winning or losing; his function is a matter of public duty than which in civil life there can be none charged with greater personal responsibility. It is to be efficiently performed with an ingrained sense of the dignity, the seriousness and the justness of judicial proceedings.

Instead, the criminal justice system is progressively stripped of its safeguards as more accused persons are without counsel to enforce their \textit{Charter} rights and freedoms. These are not the actions of a society based upon the rule of law, nor of a true constitutional democracy.

But dealing with the problems of the justice system by way of such inadequate legislated remedies has always been the remedy used. I have seen this type of undercutting of the ability of the justice system to ensure that justice is done, used several times to serve political convenience. And so, Bill C-75 provides yet another example of government resorting to the improper use of legislation just because it doesn’t cost

\textsuperscript{91} Specifically, the inability to detect wrongful convictions caused by insufficient analysis of the nature, vulnerabilities, and error rates of frequently used sources of evidence. A good example of the difficulty of detecting wrongful convictions caused by unreliable evidence (as distinguished from those caused by errors of law), in conjunction with the dangers of plea bargaining, see: (1) \textit{R. v. Hanemaayer} \textbf{2008 ONCA 580}, 234 C.C.C.(3d) 3; (2) Ken Chasse, “Plea Bargaining is Sentencing,” (2009), 14 Canadian Criminal Law Review 55; and, (3) Kent Roach, “\textit{Wrongful Convictions in Canada}” \textit{80 University of Cincinnati Law Review} 1465 (2012).

\textsuperscript{92} As to the extent of the access to justice problem (“the A2J problem”) and its solution, see: Ken Chasse, “Access to Justice—Unaffordable Legal Services’ Concepts and Solutions” (SSRN, November 8, 2018, pdf.), 153 pages; online: <https://ssrn.com/abstract=2811627>. And as to the consequences of the poor funding of the justice system, see: Ken Chasse, “\textit{No Votes in Justice Means More Wrongful Convictions}” (SSRN, June 10, 2016, pdf.), \textit{supra} note 3 and accompanying text.
much money.\footnote{Read of my experiences as a criminal lawyer, beginning in 1966, in proof of the above statements, in this article: "No Votes in Justice Means More Wrongful Convictions" (SSRN, June 10, 2016, pdf.), 28 pages, online: <https://ssrn.com/abstract=2790625>. See also supra notes 32 and 33 and accompanying texts.}

10. Conclusion

The fact that lawyers lack the knowledge to challenge the reliability of technical sources of frequently used kinds of evidence, and the tolerating of its impact upon the ability to “do justice,” is due to the under-performance of a number of institutions within the justice system. As a result, the law and the rules of practice and procedure applicable to such evidence are moving in one direction, but the reality of what are now the main sources of such evidence is moving in the opposite direction. That is the theme of this article.

The justice system must be seen as one now having several defective parts, which cumulatively create its major problems, including the inability of lawyers to challenge electronic sources of evidence. A comprehensive view of the system is necessary to reveal all of the causes of its major problems and also their needed solutions.

Providing lawyers with sufficient knowledge of technology is now a major problem because most of the evidence used for legal proceedings and legal services now comes from complex electronic systems and devices, including the data that is the basis of expert opinion evidence. Examples of such technology that produce very commonly used evidence are: (1) the electronic records management systems that produce electronic records—now the most frequently used kind of evidence; (2) mobile phone tracking evidence; (3) breathalyzer/intoxilyzer devices; and, (4) TAR devices (technology assisted review devices) that are used to conduct the “records review stage” of electronic discovery proceedings. Therefore, this article deals with the factors affecting the relationship between technology and the rules of procedure affecting legal proceedings such as, electronic discovery, disclosure, preliminary inquiries, the admissibility of evidence, and the application of presumptions and inferences, and the ultimate burdens of proof for civil proceedings, “proof on a balance of probabilities,” and in criminal proceeding, “proof beyond a reasonable doubt.”

But the technical literature warns that we trust the software by which such technology operates far too much. It warns that software errors and vulnerabilities are very prevalent and costly—error rates in the many complex applications of electronic technology. The application of procedural rules for the various types of legal proceedings should therefore have regard to: (1) the kind of evidence and witnesses the proponent of admissibility should be required to produce in order to establish, “circumstantial guarantees of trustworthiness”; (2) at which point “the onus of proof” will be transferred to the opponent of
admissibility to provide “evidence to the contrary”; (3) if it exists, how the obtaining, preservation, and production of such “evidence to the contrary” can be achieved by the opposing party; and, (4) how difficult and costly it is to do so. The answers to these issues should be seen to be interdependent, e.g., because of the nature of the technology that produces the evidence in question, the proponent of admissibility should not be allowed an advantage that imposes an unfair onus and burden of proof upon the opponent.

For example, if the obtaining of “evidence to the contrary” is too difficult and costly, then perhaps the adducing party should be required to call as witnesses the engineers and technicians who know the technology and are accountable for its performance. Then, those key witnesses being available for cross-examination, the opponent would not have to: (1) provide sufficient arguments to obtain a court order for access to the electronic system or device that produced the evidence in question; (2) overcome the objections of that technology’s first or third party owner/operator as to privacy, exposing confidential information in violation of professional or contractual obligations to others, interference with and exposure to competitors of intellectual property rights, and, costly disruptions such as might be incurred by a manufacturer or large complex facility incurring the cost of employees being put through the extensive interviews necessary to conducting an examination of the technology; and, (3) pay for the experts necessary for conducting an examination of that source of the evidence in question, which may be a prohibitively high cost.

What is new to such application of the rules of evidence and procedure is introducing a requirement of “fairness” when answering each of the above four questions as to the burden to be placed upon the opponent and proponent during proceedings adjunct to the trial, such that a particular answer to one of them is such as not to impact unfairly upon the answer forced upon one of the other questions. Therefore a “proportionate balancing of difficulties and costs” analysis is necessary, i.e., what is fair to the proponent of admissibility must also be equally fair to the opponent of admissibility. And such a “proportionality analysis” is required not only for such adjunct proceedings as discovery, and voir dires, and preliminary inquiries, but also to ensure that there will be a sufficient “opportunity to make full answer and defence” at trial, as is required by the Canadian Charter of Rights and Freedoms ss. 7 and 11(d). But that requires a sufficient knowledge of the technology that produces the evidence so as to be able to assess such factors as the difficulty and cost of producing the necessary proof of “circumstantial guarantees of reliability” and “evidence to the contrary.”

The weaknesses of the justice system that result in, lawyers’ inadequate knowledge of technology, and inadequate procedures by which to challenge technology’s reliability to produce such commonly used evidence, concern its institutions such as: governments, law schools, law societies, the courts, and those institutions that produce standards that concern the manufacturing, use, and maintenance of such technology. Governments under-fund the justice system. Law school courses don’t adequately deal with
such technology in relation to the rules of evidence. Law societies don’t: (1) provide adequate means by which lawyers can maintain their competence as to their knowledge of technology; (2) sponsor the innovations that would enable the production of affordable legal services for middle and lower income people, i.e., for the majority of society; and, (3) evolve so as to become competent to cope with the unaffordable legal services problem that prevents that majority from having lawyers. Legal literature reflects a determination in the courts to limit the time and cost of legal proceedings, but technology’s production of evidence must inevitably increase that time and cost. And, the systems that produce standards, such as Canada’s national standards for electronic records management systems, lack sufficient quality control procedures. The result is that because lawyers don’t have adequate knowledge of technology, they cannot argue that rules of procedure should be made and flexibly applied so that such rules vary with the nature of the technology that produces the evidence. Greatly aggravating this situation is the massive “access to justice” problem that has resulted in the majority of society not being able to afford lawyers who can deal with these failings of the justice system. As the percentage of litigants who are self-represented litigants grows and the number of technologies that produce commonly used evidence grows with it, the less capable is the court system to “do justice.”

If because of the above factors and circumstances, sources of evidence cannot be adequately challenged, conclusions as to the reliability of the evidence produced are a pretence, and a justice system that produces fair and adequate legal proceedings is an illusion.

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