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THE SEDONA CONFERENCE COMMENTARY ON ACHIEVING QUALITY IN THE E-DISCOVERY PROCESS*

*A Project of The Sedona Conference Working Group on
Electronic Document Retention & Production (WG1)*

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PREFACE AND ACKNOWLEDGEMENTS

Welcome to another major publication in The Sedona Conference Working Group Series (“WGS”). This is the 2013 Edition of *The Sedona Conference Commentary on Achieving Quality in the E-Discovery Process*, a project of our Working Group on Electronic Document Retention & Production (WG1). The public comment version was first published in May 2009. In the intervening time, the subject of what constitutes a *quality process* in carrying out e-discovery has only grown in recognition and importance. This Commentary has received recognition by having been cited to date both in an influential federal court opinion,[†] as well as in over 20 law reviews and hundreds of legal blogs and websites.

The present Commentary recognizes that the exponentially increasing volume of electronically stored information (ESI) that may be implicated in litigation, investigations, and regulatory activities requires fundamental changes in thinking and practice on the part of the legal profession. As outlined here, these include greater reliance on automated methods to gauge the quality of document productions (including the use of sampling and other forms of measurement), as well as increased attention to project management associated with the e-discovery process. This Commentary is intended to be read in conjunction with *The Sedona Conference Commentary on the Use of Search and Information Retrieval Methods in E-Discovery* (2013), as well as with a forthcoming Sedona Commentary on the subject of defending the e-discovery process.

This 2013 Edition incorporates many of the suggestions and updates provided by a new editorial team formed after the Annual Meeting of WG1 in Austin, Texas in the fall of 2011. I wish to acknowledge the contributions of Jason R. Baron, with whom Maura R. Grossman and Jeffrey C. Sharer took the leading role in revising and updating the prior version, as assisted by Macyl Burke, Todd Elmer, Joe Looby, James Sherer, and Paul McVoy. On behalf of The Sedona Conference, I want to thank the editorial team and all the WG1 members involved in devoting their time and attention during the editing process.

We fully understand that the matter of what constitutes best practices in maintaining quality in a particular legal case will necessarily be subject to change, given the accelerating pace of technological developments with which the law is struggling to keep up. If you wish to submit any further comments, please visit our website at <https://thesedonaconference.org> and join the online discussion forums, or email us at info@sedonaconference.org.

Kenneth J. Withers
Deputy Executive Director
The Sedona Conference
December 2013

[†] *Nat'l Day Laborer Org. Network v. U.S. Immigration Customs and Enforcement*, 877 F. Supp. 2d 87, 109 n.14 (S.D.N.Y. 2012) (Scheidlin, J.).

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EXECUTIVE SUMMARY

The legal profession has passed a crossroads: When faced with a choice between continuing to conduct discovery as it had “always been practiced” in a paper world – before the advent of computers, the Internet, and the exponential growth of electronically stored information (ESI) – or alternatively embracing new ways of thinking in today’s digital world, practitioners and parties acknowledged a new reality and chose progress. But while the initial steps are completed, cost-conscious clients and overburdened judges are increasingly demanding that parties find new approaches to solve litigation problems. The central aim of the present Commentary is to refine practitioners’ awareness about a variety of processes, tools, techniques, methods, and metrics that fall broadly under the umbrella term “quality measures” and that may be of assistance in handling ESI throughout the various phases of the discovery workflow process. These include greater use of project management, sampling, machine learning, and other means to verify the accuracy and completeness of what constitutes the “output” of e-discovery. Such collective measures, drawn from a wide variety of scientific and management disciplines are intended only as an entry point for further discussion, rather than an all-inclusive checklist or cookie-cutter solution to all e-discovery issues.

While the notion of expressly building in and accounting for “quality” might once have appeared as a somewhat novel idea in the legal discovery context, there is no shortage of competing ideas about quality methods and techniques in the world at large. These include the philosophies and combined works of such individuals as Joseph Juran on quality control,¹ W. Edwards Deming on *total quality management* (TQM) and *statistical process control* (SPC),² Armand V. Feigenbaum on *total quality control* (TQC),³ Phil Crosby on *zero defects*,⁴ Bill Smith of Motorola and *Six Sigma*,⁵ as well as *Capability Maturity Model Integration* (CMMI)⁶ and a host of Japanese *lean* methods, including Kaizen (continuous improvement).⁷

As used in this Commentary, the term *quality control* involves the specific procedures, tools, and techniques that ensure the maintenance of high quality throughout various stages of the e-discovery process (i.e., while people are conducting specific tasks). *Quality assurance*, on the other hand, refers to the methods and metrics used at the end of the process to assess and ensure that an e-discovery process has been performed reasonably and as expected.

Risk of sanctions aside, there are at least four reasons for assessing the quality of an e-discovery process:

1. The failure to employ a quality e-discovery process can result in a failure to uncover or disclose relevant evidence, which can affect the outcome of litigation.

1 JURAN’S QUALITY CONTROL HANDBOOK (J.M. Juran & Frank M. Gryna ed., 4th ed. 1988).

2 W. Edwards Deming, *OUT OF THE CRISIS* (1982).

3 Armand V. Feigenbaum, *TOTAL QUALITY CONTROL* (1961).

4 Philip B. Crosby, *Quality Is Free: The Art Of Making Certain* (1979).

5 See Paul Keller, *SIX SIGMA DEMYSTIFIED* (2005); KPMG, *Six Sigma in the Legal Department: Obtaining Measurable Quality Improvement in Discovery Management* (2006), available at http://www.lean6sigma.vn/index2.php?option=com_docman&task=doc_view&gid=27&Itemid=43 (last accessed Nov 1, 2013); see also “Six Sigma,” https://en.wikipedia.org/w/index.php?title=Six_Sigma&oldid=552846107 (last accessed Nov. 1, 2013).

6 See Mary Beth Chrissis, et al., *CMMI: Guidelines For Process Integration And Product Improvement* (2d. ed. 2006).

7 See M. Imia, *KAIZEN: THE KEY TO JAPAN’S COMPETITIVE SUCCESS* (1986); see also “Continual Improvement Process,” https://en.wikipedia.org/w/index.php?title=Continual_improvement_process&oldid=540550886 (last accessed Nov. 1, 2013); G. Taguchi, *INTRODUCTION TO QUALITY ENGINEERING* (1986); see generally, William Truscott, *SIX SIGMA: CONTINUAL IMPROVEMENT FOR BUSINESSES* (2003) (comparatively summarizing many of the above “quality” methods).

2. An inadequate e-discovery process may result in the inadvertent production or disclosure of privileged and/or confidential information.
3. Procedures that measure the quality of an e-discovery process allow timely course correction and provide greater assurance of accuracy and completeness, especially of innovative processes.
4. A poorly planned or executed effort can cost more in the long run if the deficiencies ultimately result in motion practice or require that e-discovery efforts must be redone.

Thus, the identification and use of best practices in collection, processing, review, and production are essential. Lawyers will always be free to decide how they choose to practice law; however, the courts and clients will decide who wins and loses. Winning in e-discovery increasingly means adopting lean, efficient, and effective business practices that satisfy parties' legal obligations and can withstand judicial scrutiny. These practices include (but are not limited to) using project management and appropriate measures of quality to reduce cost and mitigate risk.

Of course, the reasonableness of a party's discovery process must be evaluated on a case-by-case basis in the context of the proportionality factors set forth in Rule⁸ 26(b)(2)(C),⁹ and no practitioner should assume that any single practice, process, or quality-checking measure is appropriate in any and all circumstances.

The discussion in this Commentary is based on the following guiding principles:

Principle 1. In cases involving ESI of significant scope and complexity, the attorney in charge should utilize project management tools and exercise sufficient leadership to ensure that his or her legal team follows a reasonable process to identify potentially responsive material.

The discovery phase of litigation is best conducted under the active leadership of an attorney, acting individually or as the Team Leader,¹⁰ who is responsible for overseeing the full e-discovery process using project management tools as well as other skills and techniques. The Team Leader (and/or the team he or she leads) should have sufficient experience in the various phases of e-discovery to effectively execute the requisite management duties. Realistically, of course, it may be necessary to delegate responsibility for various phases of the process, but the Team Leader should obtain regular status updates, maintain frequent contact with the team at all levels, and ensure the effective and appropriate communication of information amongst team members.

⁸ For the sake of brevity, the Federal Rules of Civil Procedure will not be shortened to the commonly used abbreviations "Fed. R. Civ. P." or "FRCP" when referenced in the body of the text of the Commentary on Achieving Quality. However, they may occasionally be referred to simply as "the Rules" in a broad or general context. Further, when individual rules are referenced, they will simply be referred to by their numerical indicator preceded by the word "Rule."

⁹ See The Sedona Conference *Commentary on Proportionality in Electronic Discovery* (2013), <https://thesedonaconference.org/download-pub/1778>.

¹⁰ See discussion, *infra* at Part II.A.2.

Principle 2. Parties should employ reasonable forms or measures of quality at appropriate points in the e-discovery process, consistent with the needs of the case and practitioners' legal and ethical responsibilities.

A producing party must make a “reasonably diligent search for emails and other electronic documents”¹¹ sought in discovery, and parties are required to work cooperatively to formulate discovery plans that are embodied in pre-trial discovery orders.¹² These processes can be enhanced by applying reasonable measures of quality, such as: using various forms of sampling at different phases of the process; testing the results of an e-discovery process to determine whether those results are reliable; adopting reconciliation measures for different phases of the e-discovery process; and inspecting results to verify and report whether discrepancies were noted. Qualified individuals should adequately document any quality measures that were used for later support of the e-discovery process.

Rule 26(g)(1), which requires the certification of reasonableness and good faith when requesting and responding to discovery, necessitates a form of quality assurance by counsel based on an appropriate level of attention paid to ensuring accurate results. This is especially true given the exponential increase in the volumes and sources of ESI in the average case, and the new discovery tools and processes that rely on automated means of collecting, filtering, searching, and reviewing massive amounts of potentially responsive data. As discussed below, reasonable project management often entails using various forms or measures of quality at different phases of the process.

Principle 3. A thoughtful and well planned e-discovery “process” should enhance the overall quality of the production in the form of: (a) reducing the time from request to response; (b) reducing cost and burden; and (c) improving the accuracy and completeness of responses to requests.

This Commentary endorses a wide range of quality processes aimed at adding value while reducing cost and effort. A well-designed e-discovery process will employ sound project management practices that tailor the process to the specific case circumstances; use iterative and adaptive procedures and approaches that allow for learning and correction; and, where appropriate, employ statistically sound metrics to monitor course and obtain valid measures of the accuracy and completeness of the e-discovery effort.

Principle 4. Cooperation and greater transparency among parties can be key ingredients to improving quality in e-discovery. Parties should confer early in discovery, including, where appropriate, exchanging information on any quality measures that may be applied.

Generally, cooperation and greater transparency among parties throughout the discovery process can significantly contribute to ensuring quality, maintaining best practices, and reducing claims of spoliation in complex e-discovery. The discovery phase should not be a place for extended argument and advocacy. Rather, discovery should be viewed as an opportunity for cooperation and transparency, in the spirit of Federal Rule of Civil

11 *Wingnut Films, Ltd. v. Katja Motion Pictures Corp.*, No. CV 05–1516–RSWL SHX, 2007 WL 2758571, at *5 (C.D. Cal. Sept. 18, 2007).

12 *Board of Regents of Univ. of Neb. v. BASF Corp.*, No. 4:04CV3356, 2007 WL 3342423, at *5 (D. Neb. Nov. 5, 2007) (emphasizing the duty to cooperatively plan discovery and affirmatively certify reasonableness and good faith as part of an “open discovery process”).

Procedure 1.¹³ The appropriate time for advocacy and argument should arise once discovery is completed – not before or during discovery. See *The Sedona Conference Cooperation Proclamation* (2008) promoting “open and forthright information sharing, dialogue (internal and external), training, and development of practical tools.” It is a fundamental mission of The Sedona Conference to persuade requesting and producing parties that collaboration and dialogue on matters concerning ESI are appropriate, if not necessary.

As they relate to e-discovery, Federal Rule of Civil Procedure 26(f) and similar requirements to “meet-and-confer” are best viewed as a process. The process should start as early as practicable and should extend through the entire discovery lifecycle – identification, preservation, collection, processing, search, review, and production – including discussions, where appropriate, on which search and review processes or technologies will be used and what quality steps will be taken to ensure that these tools have adequately captured responsive documents. The thrust of the 2006 amendments to the Federal Rules of Civil Procedure and a consistent theme that has emerged in the myriad local rules, guidelines, and pilot programs that have been introduced in recent years, is open and forthright sharing of information by all parties during the discovery process, and “removing contentiousness as much as practicable.”¹⁴

13 FED. R. CIV. P. 1 (providing that the rules governing procedures in civil actions “should be construed and administered to secure the just, speedy, and inexpensive determination of every action and proceeding”).

14 *Board of Regents of the University of Nebraska v. BASF Corp.*, No. 4:04CV3356, 2007 WL 3342423, at *5 (D. Neb. Nov. 5, 2007). Examples of pilot programs and special local rules include: Seventh Circuit Electronic Discovery Pilot Program (May 2011), available at http://www.discoverypilot.com/sites/default/files/Principles8_10.pdf (last accessed Nov. 1, 2013); *In re Pilot Project Regarding Case Management Techniques for Complex Civil Cases in the Southern District of New York*, Case No. 1:11-mc-00388-LAP (S.D.N.Y. Nov. 1, 2011) (standing order designating the case for inclusion in the Project), available at http://www.nysd.uscourts.gov/cases/show.php?db=notice_bar&cid=261 (last accessed Nov. 1, 2013); *Default Standard for Discovery, Including Discovery of Electronically Stored Information, U.S. District Court for Delaware* (Dec. 2011), available at <http://www.dcd.uscourts.gov/sites/default/files/Chambers/SLR/Misc/EDiscov.pdf> (last accessed Nov. 1, 2013); and *Guidelines for the Discovery of Electronically Stored Information, U.S. District Court for the Northern District of California*, (Nov. 2012), available at http://www.cand.uscourts.gov/filelibrary/1117/ESI_Guidelines.pdf (last accessed Nov. 1, 2013).

I. INTRODUCTION

“For the rational study of the law the black[letter] man may be the man of the present, but the man of the future is the man of statistics and the master of economics.”

- Oliver Wendell Holmes, *The Path of the Law* (1897)

Oliver Wendell Holmes was right, in ways he could not have imagined more than a hundred years ago. Over a decade into the 21st Century, the legal profession faces exponentially increasing volumes of ESI with all of its attendant complexity.¹⁵ As characterized by one federal District Court judge: “With the rapid and sweeping advent of electronic discovery, the litigation landscape has been radically altered in terms of scope, mechanism, cost, and perplexity. This landscape may be littered with more casualties than successes. ...”¹⁶ Continuing to practice law in the same way – and, particularly, continuing to approach the discovery process in a manner divorced from best practices drawn from other disciplines, without concern for measures of “quality” – increasingly will be a recipe for failure.

Not surprisingly, the case law,¹⁷ industry literature,¹⁸ and law firms seeking a “comparative advantage”¹⁹ have increasingly emphasized the importance of quality measures involved in e-discovery. In *Victor Stanley v. Creative Pipe I*,²⁰ for example, one of the reasons a party failed to carry its burden of excusing inadvertent production of privileged documents was the party’s failure to demonstrate, *inter alia*, “quality-assurance testing.”²¹ Our discussion of the role of quality builds upon Principle 11 of the Sedona Principles:

A responding party may satisfy its good faith obligation to preserve and produce relevant electronically stored information by using electronic tools and processes, such as data sampling, searching, or the use of selection criteria, to identify data reasonably likely to contain relevant information.²²

15 Discovery Search, 17 RICH. J.L. & TECH. 9 (2011).

16 *PSEG Power N.Y., Inc. v. Alberici Constructors, Inc.*, No. 1:05-CV-657 (DNH/RFT), 2007 WL 2687670, at *1 (N.D.N.Y. Sept. 7, 2007).

17 See *William A. Gross Constr. Assoc., Inc. v. American Mfrs. Mutual Ins. Co.*, 256 F.R.D. 134, 134 (S.D.N.Y. 2009) (“This Opinion should serve as a wake-up call to the Bar in this District about the need for careful thought, quality control, testing, and cooperation with opposing counsel in designing search terms or ‘keywords’ to be used to produce emails or other electronically stored information”); *In re Serquel Products Liability Litig.*, 244 F.R.D. 650, 662 (M.D. Fla. 2007) (“Common sense dictates that sampling and other quality assurance techniques must be employed to meet requirements of completeness” [and] [i]f [defendant] took such steps, it has not identified or validated them.”).

18 See, e.g., Ashish Prasad, Kim Leffert, and Shauna Fulbright-Paxton, *Cutting to the Document Review Chase*, BUSINESS LAW TODAY (Nov./Dec. 2008), available at <http://www.abanet.org/buslaw/blt/2008-11-12/prasad.shtml> (last accessed Nov. 1, 2013) (highlighting need for quality control during document review); KPMG, *The Case for Statistical Sampling in E-Discovery* (Jan. 2012), available at <http://www.kpmg.com/us/en/IssuesAndInsights/ArticlesPublications/Documents/case-for-statistical-sampling-e-discovery.pdf> (last accessed Nov. 1, 2013); Deloitte, *eDiscovery Sampling—The What, Why, How, When and Who*, DISCOVERY MANAGEMENT DIGEST – Q3 2012 (2012), available at http://www.deloitte.com/view/en_US/us/Services/Financial-Advisory-Services/Deloitte-Discovery-Financial-Advisory/748a90e606bb9310VgnVCM2000001b56f00aRCRD.htm (last accessed Nov. 1, 2013).

19 Thomas E. Stevens and Wayne C. Matus, *Gaining a Comparative Advantage in the Process*, NAT’L L. J., Aug. 25, 2008

(suggesting use of quality-assurance techniques such as sampling to check results), available at <http://www.pillsburylaw.com/sitefiles/publications/3e2d33870915b82e23983452bae0f7d.pdf> (last accessed Nov. 1, 2013).

20 250 F.R.D. 251 (D. Md. 2008); see also *Mt. Hawley Ins. Co. v. Felman Prod., Inc.*, 271 F.R.D. 125 (S.D. W.Va. 2010).

21 *Victor Stanley I*, 250 F.R.D. at 262. Both *Victor Stanley I* and this Commentary were cited approvingly in *NDLON v. U.S. Immigration Customs & Enforcement Agency*, 877 F. Supp. 2d 87, 109 nn.14 & 15 (S.D.N.Y. 2012).

22 See *The Sedona Principles: Best Practices, Recommendations & Principles for Addressing Electronic Document Production* (2d ed. 2007) <https://thesedonaconference.org/download-pub/81>.

The Commentary to Sedona Principle 11 notes that:

Depending on the nature of the sources of data, both manual and automated procedures for collection may be appropriate in particular situations. Whether manual or automated, the procedures must be directed by legal counsel to assure compliance with discovery obligations. ...

... Regardless of the method chosen, consistency across the production can help ensure that responsive documents have been produced as appropriate.²³

Achieving “consistency across the production” requires sound project planning and oversight, which is often enhanced by integrating measurements of quality within the overall e-discovery process. As management expert Peter Drucker once declared, “If you can’t measure it, you can’t manage it.”²⁴

The ultimate goal in discovery is to identify, collect, and cull documents and ESI from a larger data universe – and to subsequently search for, retrieve, and produce the relevant or responsive, non-privileged materials using tools or methods (whether automated, human, or some combination of the two) that are reasonable and proportional under the circumstances of the case. Where appropriate, the process should incorporate some form of metrics to quantify the accuracy and completeness of the resulting output.

There is no single, “best way” through the e-discovery maze. In determining resource allocation for a given matter, practitioners should weigh the risk of overlooking relevant or privileged material against the advantages of automation, efficiency, and cost savings. In particular, strategic and tactical decisions about how to go about locating relevant evidence in a body of collected ESI (either before or during the review process) are critical.²⁵ This Commentary is not a comprehensive roadmap covering all possible uses of quality measures and metrics throughout the e-discovery process. The creativity of vendors and the bar will ensure that the development and application of quality techniques will continue to advance. Nor is there any bias toward any particular method, tool, or technology, or even a point of view that sampling or other types of quality measures are invariably required in every type of litigation. The solutions to the problems created by scale do not lie exclusively in technology – which is merely a tool – but rather in the effective use of technology by professionals skilled in team leadership, project management, and quality control and assurance.

Following this introduction, Part II.A. discusses the importance of a thoughtful, well-defined e-discovery process, and the need for team leadership and skilled project management. Part II.B. makes the case for why quality matters, and provides examples of five general measures of quality as benchmark guidance. Part II.C. summarizes judicial approaches to sampling. Part III provides selected examples of how quality measures may be applied in various phases of e-discovery, including data collection, review, and production. For the reader so inclined, the Appendix contains a primer on statistical sampling.

23 *Id.* at 58 cmt. 11.c.

24 See David A. Garvin, *Building a Learning Organization*, in HARVARD BUSINESS REVIEW ON KNOWLEDGE MANAGEMENT 46, 70 (HBS Press 1998).

25 To that end, the present Commentary dovetails, and should be read in conjunction with, The Sedona Conference, *Best Practices Commentary on the Use of Search and Information Retrieval Methods in E-Discovery* (2013), <https://thesedonaconference.org/download-pub/3669>, which more narrowly focuses on new ways of thinking about issues involving search and information retrieval.

II. ACHIEVING QUALITY THROUGH PROJECT MANAGEMENT & BETTER MEASUREMENT

A. THE IMPORTANCE OF PROJECT MANAGEMENT

1. The Need for a Well-Defined Process

Before embarking on any complex e-discovery project, it is important to recognize, first and foremost, the importance of the process that manages the task, whether it involves “simple” human review or the application of automated tools and more sophisticated techniques. Successfully meeting the challenges posed by large and heterogeneous document collections in e-discovery requires a range of contributions: from people, technology, methodology, and so on. Technologically advanced tools, however “cutting edge” they may be, will only yield successful outcomes when used by people who (a) understand the tools, (b) understand the circumstances and requirements of the case, (c) use thoughtful and well-defined methods, and (d) measure their results for accuracy and completeness. The first step, then, is to develop a thoughtful framework and process within which the applicable methodologies can be applied.

An effective process will usually include most, if not all, of the following key process elements that provide the groundwork for the effective application of technology:

Leadership	Someone who is assigned the responsibility for ensuring that the process reflects a reasonable, good-faith effort to be complete and accurate;
Tailoring	Tailoring of the process to the specific size, risks, needs, and circumstances of the particular case or investigation;
Expertise	Incorporating and drawing upon the appropriate range of expertise required to meet and accomplish the goals set for the particular process, in a timely and cost-effective manner;
Adaptability	Design of an iterative and adaptive process that allows for learning, course correction, and refinement as the project unfolds;
Measurement	Employment of reasonable and appropriate process metrics to monitor progress and ensure consistent and high-quality results;
Documentation	Documentation of the process to permit coordination and communication within the discovery team – and to increase defensibility should the e-discovery effort be subsequently challenged;
Transparency	Explanation of the selection, design, implementation, and measurement of the process in a clear and comprehensive manner to the relevant fact-finder, decision maker, tribunal, or regulator, as well as to opposing counsel, as appropriate;
Cooperation	Solicitation – and incorporation to the extent possible, and within the bounds reasonable effort and advocacy – of input from the requesting party.

2. Project Management and the Need for a Team Leader

The overall quality of any e-discovery effort will be enhanced with increased attention to project management – a discipline popularized by Henry Gantt with roots in a variety of fields, including construction, engineering, and defense.²⁶ In a nutshell, project management “is the discipline of organizing and managing resources (e.g., people) in such a way that the project is completed within defined scope, quality, time, and cost constraints.”²⁷ An almost universal key to the success of any project is the appointment of a project leader, whose responsibility is to:

Lead the team in figuring out what the project is (planning, scheduling, and requirements-gathering), shepherding the project through design and development work (communication, decision making, and mid-game strategy), and driving the project through to completion (leadership, crisis management, and end-game strategy).²⁸

The client must clearly and decisively vest power in an e-discovery project Team Leader, empowering that leader to manage the e-discovery efforts of outside counsel and service providers. A designated outside counsel may serve as the e-discovery project Team Leader but, in some cases, in-house counsel may handle the role. To borrow an analogy from the construction field, the project leader is the “Legal Architect.” In deference to familiar litigation terminology and the combination of expertise typically required for this role, in this Commentary, we refer to this individual as the “lead e-discovery attorney in charge,” or, more concisely, the “Team Leader.”²⁹

The Team Leader, working with the client and any service providers, defines the project’s budget, goals and objectives, and develops a plan for achieving the tasks and activities that need to be performed. The Team Leader understands both the substantive and strategic aspects of the litigation. Where possible, the Team Leader has experience with the various phases of e-discovery and, to the extent feasible, should balance his or her role in developing the facts of the case, interviewing witnesses, and related activities, with leadership of the team’s e-discovery efforts. In large cases, it may be appropriate for the legal team to designate a Team Leader whose primary role on the matter is to manage the e-discovery process. And in certain cases, the Team Leader may also coordinate other (non-electronic) discovery tasks in the case.

Among other things, the Team Leader should ensure that there are regular updates and there is effective dissemination of information to all team members. While daily discussions with each team member may not be practicable, a project may require an oversight and reporting structure that ensures daily communication with at least some team members.

Given the highly specialized nature of some e-discovery tasks, such as information processing, competent assistance – including that of third-party vendors – may be essential.

²⁶ In 1917, Henry Gantt developed the “Gantt Chart,” a tool used for scheduling work (first in factories) using a standard format for the display of scheduling information. Kathy Schwalbe, INFORMATION TECHNOLOGY PROJECT MANAGEMENT, 30 (5th ed. 2007). See generally “Project Management,” http://en.wikipedia.org/wiki/Project_management (last accessed Dec. 13, 2013).

²⁷ See Schwalbe, *supra*, n.26, at 30.

²⁸ Scott Berkun, *The Art Of Project Management* 8 (2005).

²⁹ The use of the singular here and *passim* is not intended to exclude the possibility that in certain legal contexts, one or more “lead” attorneys, with clearly defined duties, may play a substantial role in facilitating the overall e-discovery team effort.

The Team Leader (or other counsel participating in the discovery process) will typically be required by court or agency rules governing production to sign a discovery response or certification, an act that has consequences if the court or agency subsequently challenges the diligence and accuracy of the effort.³⁰ Because of the sheer volume of ESI, we practice in “this age of electronic discovery when attorneys may not physically touch and read every document within the client’s custody and control.”³¹ In order to certify that reasonable, good-faith efforts were made to locate and produce responsive material called for by a document or information request, practitioners must be comfortable and knowledgeable about the process(es) applied in identifying and producing the ESI. Where responsibility and accountability for different phases of the discovery process are divided among multiple persons, a certifying practitioner’s reliance on the team’s efforts must be “reasonable.”³² Under such circumstances, team members must communicate effectively to ensure a seamless, reasonable, and defensible overall process.

A more comprehensive discussion of the advantages of project management is beyond the scope of the present Commentary. However, as is increasingly being recognized,³³ the discipline may yet provide lawyers in leadership roles in the discovery process with a coherent framework for managing large-scale e-discovery matters.

B. THE NEED TO MEASURE QUALITY IN E-DISCOVERY

The concept of quality – long an important consideration for many business and manufacturing processes – increasingly is being applied to the e-discovery process. In e-discovery, an assurance of quality focuses on the usefulness of a given task’s results, as measured by the likelihood that a particular tool or method has adequately identified responsive documents and ESI.

What are the barriers to successful adoption of quality measures in e-discovery? For one thing, the variety and changing needs of cases often lead to an *ad hoc* approach to discovery management.³⁴ Moreover, in many cases, important roles are either delegated directly to third parties, or rely upon complex processes and software managed by third parties; however, either situation requires appropriate quality tests to measure those processes.³⁵ Finally, there is no universally accepted standard for a “quality” outcome. In

30 Under Federal Rule of Civil Procedure 26(g)(1)(B), for example, an attorney (or unrepresented party) that signs a discovery response is deemed to have certified that, to the best of the person’s knowledge, information and belief “formed after a reasonable inquiry” that the response is not interposed for an improper purpose and neither unreasonable nor unduly burdensome. See *Mancia v. Mayflower*, 253 F.R.D. 354, 360 (D. Md. 2008) (noting that Rule 26(g) requires “approaching the process properly ... in accordance with the letter and spirit of the discovery rules”); accord *Cache La Poudre Feeds v. Land O’Lakes*, 244 F.R.D. 614, 628-630 (D. Colo. 2007) (noting that counsel is required to undertake a reasonable investigation to identify and preserve relevant materials in course of responding to discovery requests).

31 *Qualcomm, Inc. v. Broadcom Corp.*, No. 05cv1958-B (BLM), 2008 WL 66932, at *9 (S.D. Cal. Jan. 7, 2008), *vacated in part and remanded*, No. 05CV1958-RMB (BLM), 2008 WL 638108 (S.D. Cal. Mar. 5, 2008).

32 Where in-house counsel is the one to perform the efforts to search and produce documents and ESI, certifying counsel may rely “on assertions by the client and on communications with other counsel as long as that reliance is appropriate under the circumstance.” Advisory Committee Note, FED. R. CIV. P. 26, Subdivision (g) (1983). Cf. *Qualcomm, supra*, n.31. One way that certifying counsel can do this is to forward the draft discovery request, response, or objection to in-house counsel (and where appropriate, the relevant in-house IT representative), to facilitate review and confirmation that the submission is complete and accurate before it is served or filed.

33 See, e.g., Association of Corporate Counsel, ACC VALUE CHALLENGE: GUIDE TO PROJECT MANAGEMENT (2011). <http://www.acc.com/advocacy/valuechallenge/toolkit/loader.cfm?csModule=security/getfile&pageid=1293786&page=/index.cfm&qstring=&title=ACC%20Legal%20Project%20Management%20Primer> (last accessed Nov. 1, 2013); Jeane Thomas & Ben Hawksworth, *Lessons Learned, Master Mining: Three Views on EDD Project Management*, LAW FIRM INC. (Mar./Apr. 2006), reprinted in http://www.crowell.com/documents/DOCSOCFKTYPE_ARTICLES_396.pdf (last accessed Nov. 1, 2013).

34 Litigation projects involving custom specifications defined by the user, while highly configurable and flexible, lead to a non-standardized approach that does not lend itself to repeatability and inherent engineered quality.

35 See n.17, *supra*.

traditional discovery, that standard has always been one of “reasonableness,” rather than “perfection”; this Commentary does not argue to the contrary.³⁶

1. Why Does Quality Matter?

Faced with uncertainty, some practitioners question whether assuring quality in e-discovery is really that important. Sanctions aside, we believe that quality is extremely important for at least four principal reasons:

First, failure to employ a quality e-discovery process can result in failure to uncover or disclose key evidence. This reason is the most compelling and, potentially, most important for the parties to a case. A simple example: If search terms are used without quality testing, a party may not find exculpatory or “hot” documents (and their many near duplicates) crucial for convincing an adversary to settle the matter or, for that matter, inculpatory documents that could make settlement a wise strategy for the producing party. Depending on the size and scope of the case, the implications can be expensive and far-reaching.³⁷

Second, a poorly conceived or managed e-discovery process may result in the inadvertent production of privileged or confidential information.³⁸ This common concern often prompts many outside counsel to undertake resource intensive, manual review of electronic documents, with its attendant high cost. Moreover, some aspects of collection and review frequently involve corporate intellectual property (IP), trade secret, and otherwise confidential ESI. A quality process will identify these items and designate them for protective treatment earlier rather than later in the process.

Third, e-discovery processes that incorporate measures of quality are more defensible because they provide metrics – and, if properly implemented, allow for course correction and refinement. A Team Leader who measures discovery process quality as discovery progresses, or reasonably soon thereafter, is well positioned to make any necessary modifications. If there are mistakes, or if a systemic or systematic error is discovered, an informed Team Leader may be able to modify the process in midstream before there is a challenge to the production.

Fourth, poor quality can lead to deficiencies in production, ensuing motion practice, and e-discovery efforts that must be redone. Each step leads to increased costs. While historically, higher quality meant higher cost; that is not necessarily the case today. It is often less expensive to engineer quality into the process than to add it after the fact. In fact, many quality programs have begun incorporating measurement, tracking, and savings reports into the process as a measure of success.

³⁶ While the reasonableness standard is not a bright-line rule and lends itself to ambiguity, confusion and, at times, disputes; it also is a standard that is easily adaptable to the numerous different discovery contexts and cases. *See, e.g., Pension Committee of the University of Montreal Pension Plan v. Banc of America Securities*, 685 F. Supp. 2d 456 (S.D.N.Y. 2010), *overruled in part on other grounds by Chin v. Port Authority of New York & New Jersey*, 685 F.3d 135 (2nd Cir. 2012); *see also* FED. R. CIV. P. 26(g)(1) (certification of discovery responses made “to the best of the person’s knowledge, information, and belief *formed after a reasonable inquiry*”) (emphasis added); *Rinkus Consulting Group, Inc. v. Cammarata*, 688 F. Supp. 2d 598, 613 (S.D. Tex. 2010) (“Whether preservation or discovery conduct is acceptable in a case depends on what is *reasonable*, and that in turn depends on whether what was done – or not done – was *proportional* to that case and consistent with clearly established applicable standards. As Judge Schiendlin pointed out in *Pension Committee*, that analysis depends heavily on the facts and circumstances of each case and cannot be reduced to a generalized checklist of what is acceptable or unacceptable.”) (emphasis in original); Craig B. Shaffer, “*Defensible*” By What Standard?, 13 SEDONA CONF. J. 217, 222 (2012) (“While a defensible e-discovery plan is not held to a standard of perfection, [FRCP 34] does require a party to undertake reasonable efforts to identify and produce responsive, non-privileged material in its possession, custody or control.”).

³⁷ *See, e.g., Qualcomm, supra*, n.31.

³⁸ *See Victor Stanley I, supra*, n.21.

These points raise a related issue that parties involved in e-discovery should understand: the distinction between “quality control” and “quality assurance.”

Quality control involves engineering quality into a process. It uses procedural safeguards built into a process to ensure high quality throughout, and it focuses on the execution of specific tasks.

For example, if someone is moving 10 items from point A to point B, the quality-control step in that process would be to count the items before the move, and then again after the move, to ensure that all of the items were transferred (i.e., a “reconciliation”). This Commentary suggests that quality control should be built into the e-discovery process.

Quality assurance, on the other hand, typically takes place after a process is complete and involves an assertion as to what was done, how well it was done, and whether the output met a certain predetermined standard. Quality assurance generally refers to the procedures designed to serve as the basis for certification and reliance. Because quality assurance often involves an intensive, third-party audit of process and activities, it can be much more intensive and expensive – particularly in a large, complex e-discovery project. For many e-discovery projects, a full-scale quality-assurance process may not be practical, financially feasible, or proportionate in the circumstances of the case, and thus, would be unwarranted. In such cases, it may be appropriate to consider a more targeted approach. Five principal measures of quality are especially useful in regard to e-discovery.

2. Five Measures of Quality

a. Judgmental Sampling

Accountants typically use a form of judgmental sampling as a form of quality control to find material misstatements where there are many similar financial transactions; this sampling method can greatly reduce the cost of an audit while maintaining its integrity. A typical example is accounts payable, where a large number of invoices pass through and are subjected to the same procedures, thus allowing representative samples to be drawn.³⁹

What can be described as “judgmental sampling” also has been used in traditional e-discovery.⁴⁰ Attorneys often select a few folders of electronic documents coded by a particular reviewer to determine whether the reviewer is making the correct responsiveness calls. After reviewing the judgmental sample, the more senior attorney may, based on the exercise of informed judgment, request additional samples or require a heightened second-level review if the perceived error rate is unacceptable. A judgmental sample, unlike a statistically valid sample, does not permit one to make assertions about the entire population from which the sample was drawn with statistical confidence, but can nevertheless be very helpful.⁴¹

39 Janet L. Colbert, *Audit Sampling*, INTERNAL AUDITOR (Feb. 1, 2001), at 27.

40 The distinction between “judgmental” and “statistical” sampling is discussed in more detail in the Appendix (“Sampling 101 for the E-Discovery Lawyer”).

41 The reviewer may be aware of, and take into account, the source of the documents, the size of the population, the types of information at issue, and the degree to which the results conform to other sources of oral, written, or physical testimony or evidence.

This method is especially useful as a quality check on discretionary processes, such as collection and review. For example, an experienced professional can review a report from the collection phase that lists evidence sources collected for each custodian, and may identify gaps in the collection (e.g., a hard drive was not collected for a particular custodian). The professional selects this and other apparent exceptions and has staff research the anomaly and perform remedial action (e.g., collect the hard drive), or annotate the collection report (e.g., note that the individual does not use a personal computer), as appropriate.⁴²

The selection of keywords as search terms for responding to discovery requests is a special form of judgmental sampling that is based on many factors, including prior knowledge as well as educated guesses with respect to what a collection of ESI may contain.⁴³ There will always be some measure of informed judgment involved with the selection of search or filtering criteria at various phases of e-discovery.

Notably, the initial results produced by human judgmental sampling can be – and, increasingly, are expected to be⁴⁴ – further refined and improved through greater use of iterative processes.⁴⁵

b. Independent Testing

Third-party professionals can be retained to examine a process or approach and report on whether results can be replicated and confirmed. One such example might be automated or highly technical processes, such as data processing, searching, or computer-assisted coding, that have been challenged on the basis of reliability and accuracy. Thus, a native file processing application (i.e., software that converts files from their “native” or “proprietary” form into a generic form, such as *.tiff images for further processing) might be tested to validate (or invalidate) the software’s reported efficacy at extracting files from an email container, accurately displaying such files for review, and indexing the searchable text in such files.

Currently, these “black box” technologies often are described only by what they can do – not by what they cannot do – leaving the industry in a *caveat emptor* situation. This is expected to change, as there have been a few widely reported deficiencies in the capability of certain native file processing technologies to completely render email, extract embedded objects, search compound documents or containers, extract metadata, and the like.⁴⁶

42 Similarly, an experienced professional can review a report from the review phase that lists the documents marked or reviewed, by reviewer, per hour, or relevant documents per custodian, and from a high level, may be able to identify outliers or other unusual patterns.

43 See *Sedona Search Commentary*, *supra* n.25, *passim*.

44 See, e.g., *Natl. Day Laborer Org. Network v. Immigration and Customs Enforcement Agency*, 877 F. Supp. 2d 87 at 110 (noting “research showing that, in many contexts, use of keywords without testing and refinement (or more sophisticated techniques) will in fact not be reasonably calculated to uncover all responsive material”); *In re Sequel Products Liability Litig.*, 244 F.R.D. 650, 662 (M.D. Fla. 2007) (“[W]hile key word searching is a recognized method to winnow relevant documents from large repositories, use of this technique must be a cooperative and informed process. ... Common sense dictates that sampling and other quality assurance techniques must be employed to meet requirements of completeness.”).

45 See *Victor Stanley I*, 250 F.R.D. at 262 (“Selection of the appropriate search and information retrieval technique requires careful advance planning by persons qualified to design effective search methodology. The implementation of the methodology selected should be tested for quality assurance; and the party selecting the methodology must be prepared to explain the rationale for the method chosen to the court, demonstrate that it is appropriate for the task, and show that it was properly implemented. In this regard, compliance with The Sedona Conference *Best Practices for Use of Search and Information Retrieval* will go a long way towards convincing the court that the method chosen was reasonable and reliable.”). See also George L. Paul & Jason R. Baron, *Information Inflation: Can The Legal System Adapt?*, 13 RICH. J.L. & TECH. 10 at 50 (2007) (suggesting iterative protocols be used).

46 One additional method to verify systems and processes is to employ “known sample” testing, where systems and processes are applied to a known collection, with defined characteristics, to measure the results. This is useful in establishing the basic scope and functionality of search systems and review protocols. In particular, this method is used in by legal-service providers to test prospective reviewers against a “test folder” of already-coded documents, to establish how well the reviewers can absorb and apply a given review protocol.

Similarly, in some circumstances, it may be appropriate to call upon third-party professionals to recommend a test design that would allow independent verification that a production has met an agreed-upon standard of accuracy. Ideally, the general framework for such independent testing would be agreed upon by the parties at the outset of the discovery phase of the litigation or investigation (see below, on the question of when quality measures and metrics may be appropriate).

c. Reconciliation Techniques

Reconciliation to account for the impact of a process (i.e., comparing inputs to outputs) has long been used in the fields of accounting, manufacturing, and engineering and may have applicability to the e-discovery process. E-discovery process reconciliation might involve comparing what volume of email or ESI enters a process, what remains in a process (after, for example, deduplication), and what exits a process. This could help determine whether email or other files were handled correctly, or identify gaps in the process that may have resulted in the omission or incomplete handling of files.⁴⁷

d. Inspection to Verify and Report Discrepancies

Inspection and observation of participants in the e-discovery process resemble the original form of quality control, which was part of the apprenticeship model for training junior attorneys. Inspection is especially useful as a quality check on processes such as collection and review. The deployment of seasoned experts to inspect and observe the performance of tasks by less-experienced staff can improve quality on a project. For example, during collection, it is often advisable to have senior legal and technical participants involved in the initial custodian interviews. Experienced staff can coach less-experienced staff, as well as further define or refine the process (such as by improving the custodian interview questionnaire). During the review phase, it is equally advisable to improve quality by having a seasoned reviewer observe the review and provide guidance. This should be done on a frequent and iterative basis, as reasonable and appropriate.

e. Statistical Sampling

The concept of measuring the quality of the output of a process by sampling is not new. Acceptance sampling,⁴⁸ for example, was used by the U.S. military to test the quality of bullets manufactured for use during WWII, to spot design defects, and ultimately, to improve production.

Today, some form of acceptance sampling is used as a quality-control tool by virtually every large and medium-sized manufacturing company in the world. For example, Boeing's instructions to its suppliers require that they "perform either 100% inspection or acceptance sampling for receiving inspection."⁴⁹ This can be seen as a fundamental type of quality control, which is composed of many methods, depending upon the application.

⁴⁷ Reconciliations from the phases before and after native file processing can be extremely complex.

⁴⁸ First introduced in the 1920s by Walter A. Shewhart, this approach is referred to as "Statistical Process Control," and uses statistical tools to observe the performance of the production line to predict significant deviations that may result in rejected products. By maximizing the efficiency of war production, William Edwards Deming popularized the use of this quality control method.

⁴⁹ The Boeing Co., *Quality Assurance Manual*, at D8-4890.105 (2001), available at <http://www.boeing.com/terms/d8-4890105.pdf> (last accessed Nov. 1, 2013).

Standards organizations, such as the International Standards Organization (ISO), a network of the national standards institutes of 157 countries, have created procedures and guidelines for acceptance sampling. Statistical sampling also is required by many government agencies to test the quality of a given population of products.⁵⁰

As noted, statistical sampling permits statements to be made about the population from which the sample was drawn with statistical confidence and is helpful when one wants to get as close to the truth as possible, but time and cost prohibit the testing of each item, or such testing is technically infeasible. It is a “scalable solution,” one that works well regardless of the size of the sampled population.

In the e-discovery context, statistical sampling can serve as a check on the effectiveness of search and review efforts at identifying responsive information and correctly coding documents, whether the efforts are manual or technology-assisted. A party could identify a random sample of documents that the review method did not identify as potentially responsive and review them for responsiveness. By doing so, the party can obtain an estimate of the number of responsive documents remaining in the set of documents that were not selected for further review. Based on the results of such testing, the producing party can take informed actions to improve its review process to close the gap between what was identified as responsive and what was actually responsive.⁵¹

Statistical sampling also can be used to measure the probable error rate for a project, a key custodian’s documents, or even for a specific document reviewer. An acceptable error rate can be defined and document groups with error rates above this threshold can be re-reviewed and retested until the results meet or exceed the quality standard.⁵²

Whether or not a given error rate is truly indicative of an effective review effort will depend upon the prevalence of responsive material in the document collection to begin with. Gauging that will generally require taking into consideration the number of documents in the collection that the search or review method deemed to be responsive, and the proportion of those so deemed that are actually responsive (i.e., the precision). Only when measured in relation to these data points (i.e., prevalence and precision) will an error rate, in the set of documents deemed non-responsive, have any meaning regarding the effectiveness of the review effort (i.e., serve as a gauge of whether or not the review effort has, in fact, succeeded in identifying a reasonably high proportion of the responsive material in the document collection). Put another way, in deciding on what is and is not an acceptable error rate, one should begin by deciding what is and is not an acceptable level of recall and then translate that level of recall into the corresponding rate of error in the set of documents deemed non-responsive.

The size of the sample (and associated review time and cost) required to ascertain that a review effort has met a given standard of quality and, more specifically, met a given

50 For example, the U.S. Department of Agriculture uses sampling plans to test the quality of most of the products it regulates and has codified sampling requirements in Title 7, § 43 of the U.S. Code. The Internal Revenue Service allows the use of sampling estimates by taxpayers to determine amounts where other estimates are not feasible.

51 See *Da Silva Moore v. Publicis Groupe*, 287 F.R.D. 182 (S.D.N.Y. 2012), 2012 WL 1446534, at *2 (S.D.N.Y. Apr. 26, 2012) (protocol utilizing iterative sampling); *In re Actos (Pioglitazone) Products*, No. 6–11–md–2299, 2012 WL 3899669 (W.D. La. July 30, 2012) (same).

52 For example, a review team has a set of documents to review for a particular custodian, say 100,000. A smaller team can then review a random sample of those documents to determine how many were incorrectly coded (either as responsive or non-responsive). The team would also decide an acceptable error rate, e.g., 5%. If the number of incorrectly coded documents for the particular custodian is above this threshold, the team can review additional documents, conduct searches if there was a common error in coding (e.g., an issue missed by a number of reviewers). The team then would then perform another random sample to determine whether the error rate is now within the established, acceptable threshold.

level of recall, will vary with the values taken by a number of parameters, some of which are discretionary – e.g., the standard of quality to be met and the confidence level sought in establishing that the standard has been met – and some of which are not (e.g., the prevalence of responsive material in the document population). Some parameter settings will entail very large sample sizes; others will entail relatively small samples. Parties should take into account the specific circumstances of a given review effort in arriving at a sampling design that will strike the optimal balance between the information provided and the effort and resources required to obtain that information.

3. When are Quality Measures and Metrics Appropriate?

While some or all of the preceding techniques can be helpful in measuring and improving the quality of an e-discovery process, there is no universal consensus on when and how they should be applied – or even what constitutes a quality process. Nor can one expect to simply transfer “off-the-shelf” industrial techniques to e-discovery.⁵³ That is why, to the extent it is feasible, parties may want to discuss how quality will be assured and, if appropriate, measured.

Because it is not practical to apply every (or perhaps any) metric to every step in every case, legal teams must prioritize and determine which quality measures should be applied, and when, based on various factors that include, among others, the value of the claims or damages, the size and complexity of the case, and the time and resources the parties have to expend on implementing quality-control measures. Clients, opposing parties, courts, and regulators may have an important say in the selection of these procedures as well.

In the case of complex matters – for instance, an SEC or criminal investigation of a high-ranking corporate officer – a team may opt or be required to perform judgmental sampling, independent tests, and inspections as every phase unfolds; and then do statistical sampling, reconciliations, and independent testing at the end of the process, because cost considerations in such cases will often be secondary to ensuring that the process is as accurate and complete as it can be.

At the other end of the spectrum may be a very small case where the use of quality metrics likely would be light, if they were used at all. In other words, the marginal utility of an assessment of quality must be weighed against, and should be proportional to, the burdens and costs involved, and the anticipated benefits.

Some other questions to consider in assessing the appropriateness of the use of quality methods and metrics are:

- Whether and how quality measurement tools and methods will be used? Will quality be measured during the culling process or further downstream, such as during relevancy or privilege review, or production, or at multiple stages of the project?

⁵³ In analyzing the quality of a given review process in identifying responsive documents, one may need to factor in a scale of relevance – from technically relevant, to material, to “smoking gun” – in ways which have no direct analogy to the industrial-based processes referenced above. Indeed, most quality applications assume one is looking at independent and fairly homogenous events (i.e., events of similar or like character), with an implied inference that probability affects each item equally. This may or may not be the case in the e-discovery context, and therefore, it may be important to understand notions of variance and how much variance should be tolerated coming out of a given process.

- Who will be applying the tools and methods? Will they be applied by experts or by non-experts (e.g., attorneys, paralegals, litigation support staff, and/or third parties)? If by non-experts, consideration must be given to the transfer of case-specific knowledge to the users, to the training of the users in effective use of the tools and methods, and to the overall usability of the tools and methods themselves.
- How will the output be used? Will the tools and methods be used for testing or assessment purposes only (e.g., in order to learn more about the target collection, in order to navigate more efficiently through the documents, in order to prioritize the review, and so on), or will they be used to discern what should receive further review and what should not?
- On what part of the collection will the quality measures be used? Will quality only be assessed regarding documents that are potentially responsive, or also upon the documents that are presumptively non-responsive after culling techniques have been applied?
- To what degree is it anticipated that an expert will be required to defend the process, or that another party's expert will attack the scientific validity of the tools and methods?

4. The Need for Documenting a “Quality” Process

Employing the above measures of quality in e-discovery may be prudent, even necessary, in many settings. It is equally important carefully to document the use of such processes; indeed, failure adequately to document the steps taken to sample, test, inspect, reconcile, or verify one's results can affect the litigant's ability to defend its process to the opposing party or to the court. In *United States v. O'Keefe*,⁵⁴ consistent with earlier case law,⁵⁵ the Court noted the importance of providing the Court with appropriate explanations in cases where the parties have not agreed upon the use of keywords and the search task has been performed unilaterally.⁵⁶ In *Victor Stanley I*, the Court found that defendants were “regrettably vague” in describing their approach to keywords, regarding “how they were developed, how the search was conducted; and what quality controls were employed to assess their reliability and accuracy.”⁵⁷ Accordingly, the Court went on to hold that attorney-client privilege had been waived. Challenges in that type of situation should be addressed by persons competent to do so, not merely by conclusory statements of counsel.⁵⁸ Documentation of the process(es) to be employed also may be helpful in situations where courts proactively encourage parties to cooperate in discussing sampling and other protocols to be used as part of overall e-discovery plans.⁵⁹

⁵⁴ 537 F. Supp. 2d 14 (D.D.C. 2008).

⁵⁵ See *Judicial Watch, Inc. v. U.S. Dep't of Justice*, 185 F. Supp. 2d 54, 64 (D.D.C. 2002) (expressing inability to determine if a search was “reasonably calculated” to recover documents where the party failed to explain keywords used).

⁵⁶ *Accord Equity Analytics, L.L.C. v. Lundin*, 248 F.R.D. 331 (D.D.C. 2008) (involving file extensions).

⁵⁷ 250 F.R.D. at 256. See also *Walter A. Gross, supra*, n.15 (highlighting need for attention to be paid to quality control in developing search terms); *Rhoads Indus., Inc. v. Bldg. Materials of Am.*, 254 F.R.D. 216, 224 (E.D. Pa. 2008) (referencing need for “proper quality assurance testing,” citing *Victor Stanley I*).

⁵⁸ 250 F.R.D. at 261 n.10 (to be accomplished by “affidavits or other equivalent information from persons with the requisite qualifications and experience”).

⁵⁹ See, e.g., *Columbia Pictures Indus. v. Bunnell*, No. CV 06-1093FMCJCX, 2007 WL 2080419, at *14, n.32 (C.D. Cal. May 29, 2007) (court “encourages the parties to meet and confer regarding sampling”); *Zurich American Ins. Co. v. Ace American Reins. Co.*, No. 05 Civ. 9170 RMB JCF, 2006 WL 3771090, at *2 (S.D.N.Y. Dec. 22, 2006) (court orders parties to devise a protocol for sampling).

At the outset of any e-discovery process, the Team Leader (or his or her delegate) should determine the documentation standards and controls appropriate for the particular matter, and then re-evaluate those standards and controls as the matter progresses, to ensure their ultimate defensibility. The Team Leader should act under the assumption that every aspect of the process employed could be challenged and, as appropriate, include quality measures designed to answer those challenges in the overall project plan. This entails creating and updating documentation in real time, as decisions are made, to best assure that declarations and other statements regarding the outcome of the process will be adequately supported if and when the need arises at a later date.

C. JUDICIAL APPROACHES TO SAMPLING

The Federal Rules of Civil Procedure contemplate the use of “sampling” as a means of reducing the enormous burdens posed by the vast volumes of ESI in litigation today. For example, in connection with Rule 26(b)(2)(B), the Advisory Committee noted the affirmative role that sampling may play when assessing whether “good cause” has been shown to order production of information from sources identified as not reasonably accessible, stating that “the parties may need some focused discovery, which may include sampling of the sources, to learn more about what burdens and costs are involved in accessing the information, what the information consists of, and how valuable it is for the litigation in light of information that can be obtained by exhausting other opportunities for discovery.”⁶⁰

In the litigation context, the term “sampling” can have a number of different meanings, depending upon how the sample is selected and the purpose for which it is used. Thus, courts distinguish between “judgmental sampling” and “statistical sampling,” the latter of which has been traditionally used primarily in determining “adjudicative facts.”⁶¹

As early as 1963, survey conclusions based on “random sampling”⁶² and the application of probabilistic principles were deemed admissible in court as evidence to establish facts in dispute.⁶³ Thus, for example, statistical sampling has routinely been used in discrimination cases to assess whether discrimination has occurred.⁶⁴ These cases draw on probability theory to determine whether the observed variations at issue may have resulted from chance, or whether they demonstrate a pattern of intentional misconduct.⁶⁵

More recently, in the “light’ cigarettes” class action litigation,⁶⁶ Judge Weinstein concluded that “[s]ampling and survey techniques are well-accepted alternatives for the trial judge facing crippling discovery and evidentiary costs,” and that “[g]reater reliance on

60 In a different context – acknowledging the power of one party to compel a sample from another under certain circumstances not relevant here – Rule 34(a) was amended to state that “[a]ny party may serve on any other party a request to produce and permit the party making the request, or someone acting on the requestor’s behalf, to inspect, copy, test, or sample any designated documents or electronically stored information” in the respondent’s possession, custody or control, and also includes provision for entering on to the premises of the responding party “for the purpose of inspection and measuring ... testing, or sampling. ...” (emphasis added).

61 *Rosado v. Wyman*, 322 F. Supp. 1173, 1180 (E.D.N.Y. 1970), *aff’d*, 437 F.2d 619 (2d Cir. 1970), *aff’d*, 402 U.S. 991 (1971).

62 See Appendix, *infra*.

63 In *Zippo Mfg. Co. v. Rogers Imports, Inc.*, the plaintiff manufacturer of cigarette lighters employed three surveys of the relevant smoking population to demonstrate a likelihood of confusion among consumers in support of its claim for trademark infringement. 216 F. Supp. 670 (S.D.N.Y. 1963). For an interesting and comprehensive discussion of court decisions involving statistical sampling, see Laurens Walker & Joan Monahan, *Sampling Evidence at the Crossroads*, 80 S. CAL. L. REV. 969 (2007).

64 See, e.g., *Castaneda v. Partida*, 430 U.S. 482, 495-96 (1977); *Stewart v. General Motors Corp.*, 542 F.2d 445, 449 (7th Cir. 1976); see also *Capaci v. Katz & Besthoff, Inc.*, 711 F.2d 647, 653-57 (5th Cir. 1983).

65 See *Ageloff v. Delta Airlines, Inc.*, 860 F.2d 379, 383-84 (11th Cir. 1988); see also *G.M. Brod. & Co., Inc. v. U.S. Home Corp.*, 759 F.2d 1526, 1538-40 (11th Cir. 1985) (expert testimony established profit projections based on industry standards).

66 *Schwab v. Philip Morris USA, Inc.*, 449 F. Supp. 2d 992, 1245, 1247 (E.D.N.Y. 2006), *rev’d* on other grounds sub nom. *McLaughlin v. Am. Tobacco Co.*, 522 F.3d 215 (2d Cir. 2008).

statistical methods is required by the profound evolution in our economic communication and data compilation and retrieval systems in recent decades.”⁶⁷ The Court noted that the Supreme Court had recently permitted sampling as a method for the Internal Revenue Service to assess unreported tips by restaurant employees.⁶⁸

As described below,⁶⁹ statistical sampling can help provide assurance of the accuracy of automated or other tools used to reduce the size of a given population of ESI for purposes of review.

Statistical or probabilistic sampling stands in contrast to the less formal “judgmental sampling,” that is often used to facilitate the exercise of discretion by a court or by a party seeking to assess the quality of a process. This is the context referred to in the Committee Note to Rule 26(b)(2)(B) quoted above. For example, courts routinely utilize samples of arbitrary size drawn from a population of potential sources to help them exercise judgment as to the extent to which a party should restore backup tapes, and who should bear the costs of doing so. In the cases of *McPeck v. Ashcroft*⁷⁰ and *Zubulake v. UBS Warburg LLC*,⁷¹ for example, the Courts utilized informal sampling techniques in connection with assessment of the marginal utility of investing resources in the restoration and recovery of ESI from backup tapes. Similarly, in *Quinby v. WestLB AG*,⁷² the Court refused to require a producing party to absorb the full cost of restoring and searching backup tapes where a review of a sample showed that “only a small percentage of the emails produced are relevant.”⁷³

The use of keyword searches to cull or filter relevant information from massive amounts of ESI is another example of the use of judgmental sampling, the effectiveness of which is subject to evaluation by testing. “For example, a producing party could apply a certain set of keywords and/or concepts to cull down a sample of the collection and then analyze the results.”⁷⁴ Trial or pilot runs of combinations of words may be tested in an iterative fashion to extrapolate the effectiveness of the chosen set. In the case of *Clearone Communications v. Chiang*,⁷⁵ for example, the Court noted that an initial effort to modify conjunctive search terms was, in effect, a first step in a “sampling” process to avoid over inclusiveness, or what are commonly referred to as “false positives.” As noted by another Court, “[c]ommon sense dictates that sampling and other quality assurance techniques must be employed to meet requirements of completeness.”⁷⁶ There is a growing recognition that, in most cases, this will require that the producing party review not only those documents that “hit” on selected search terms, but also review samples drawn from those documents that do not hit on such terms in order to identify the rate of “false negatives” and then, in an iterative fashion, to supplement or refine the search terms as necessary to reduce that rate to a level that is acceptable under the circumstances of the particular case.⁷⁷

67 *Schwab*, 449 F. Supp. 2d at 1244-45.

68 *See United States v. Fior D'Italia, Inc.*, 536 U.S. 238, 247-48 (2002); *see also Schwab*, 449 F. Supp. 2d at 1244.

69 *See generally* discussion *infra*, Part III.B.2.

70 202 F.R.D. 31, 34-35 (D.D.C. 2001).

71 217 F.R.D. 309, 324 (S.D.N.Y. 2003).

72 245 F.R.D. 94 (S.D.N.Y. 2006).

73 The court found that the number of relevant documents was “quite low when compared to the volume of documents produced.” *Id.* at 109.

74 *See* Mia Mazza, Emmalena K. Quesada, Ashley L. Sternberg, *In Pursuit of FRCP 1: Creative Approaches to Cutting and Shifting the Costs of Discovery of Electronically Stored Information*, 13 RICH. J. L. & TECH. 11, at 38 (2007) (when results show the use of those combinations did not remove a large volume of relevant information, it validates and supports their use to cull down the remainder of the collection).

75 Civil No. 2:07cv00037TC, 2007 WL 3275300 (D. Utah Nov. 5, 2007), *modified* No. 2:07 CV 37 TC, No. 06-30378, 06-30379, 2008 WL 920336 (D. Utah Apr. 1, 2008).

76 *Seroquel Products Liability Litig.*, 244 F.R.D. at 662; *see also In re Viox Products Liability Litig.*, No. 06-30378, 06-30379, 2006 WL 1726675, at *2 (5th Cir. May 26, 2006) (appellate court urging parties to “adher[e] to a statistically sound protocol for sampling documents” as an aid in reducing the trial court’s burden in reviewing the assertion of privilege on 30,000 documents), *on remand*, 501 F. Supp. 2d 789 (E.D. La. 2007).

77 For example, the *Da Silva Moore* and *Actos* cases involving technology-assisted review, *see* n.51, *supra*, are examples of where the parties have agreed to conduct sampling along these lines.

III. APPLYING QUALITY MEASURES IN E-DISCOVERY

E-discovery involves locating and delivering non-privileged documents and ESI responsive to non-objectionable discovery requests, using a reasonable search method tailored to the needs of the case. The question for the producing party is how best to capture and properly produce this deliverable, what resources should be allocated to the task, and how those resources should be used.

Each case or matter – whether a discrimination claim, patent dispute, or antitrust “second request” – has its own dynamics that will shape the project plan. A series of predictable decisions will be required and each phase of discovery has quality aspects that need to be considered. A non-comprehensive list of examples drawn from select phases of the discovery process follows.

A. THE DATA COLLECTION AND CULLING PHASES

1. Building on Traditional Approaches to Document Collection and Culling

In the days of paper, lawyers knew how to ask for and collect “documents.” Key custodians would be asked to gather their hard-copy documents and files into boxes, which were made available to lawyers or paralegals to review. Practitioners essentially reviewed each and every page for relevance and privilege. This time-worn process admittedly grew more complex in large litigation matters (e.g., antitrust actions or products liability class actions), where tens or even hundreds of thousands of boxes of documents were collected from a corporate enterprise for review by legions of junior associates and contract attorneys.⁷⁸ Much the same process continues to be employed for the review of large bodies of evidence that exist only in hard-copy form.

With the advent of computers, the Internet, network servers, email, and the explosion in types and volumes of ESI, the collection process has had to adapt to the rapid changes and volume considerations involved. Yet, there is still a need to understand what to ask for that potentially could be relevant, what the sources of those items might be, and what key players would best know about the relevant materials. What has changed materially is the need to engage IT and business professionals who are knowledgeable about the sources and locations of ESI within the enterprise, as well as any outsourced storage that may exist in the possession of third parties or in the “cloud.” These professionals will be informed as to what ESI is online, near-line, and off-line; what may be zipped or encrypted; what may be found on backup sources such as CDs, DVDs, virtual storage devices, servers, and removable storage devices (e.g., flash drives, mobile devices, etc.); and in archives of all kinds. These are all potential sources for collection in any e-discovery process that seeks to identify information relevant to a particular litigation or investigation.

2. Applying Measures of Quality to Data Collection and Culling

While it is generally understood, particularly where ESI is involved, that perfection is not the standard (nor even, in most cases, attainable),⁷⁹ parties do have an

78 See, e.g. *Transam. Computer v. IBM*, 573 F.2d 646, 648 (9th Cir. 1978) (refusing to find waiver of privilege where “unique circumstances” existed, requiring production within a three-month period of approximately 17 million pages, creating “monumental” problems because the pages were not “grouped or batched together”).

79 See *Pension Committee*, *supra* n.36.

obligation to conduct e-discovery reasonably, proportionately, and ethically, demonstrating appropriate professional care and judgment. Given the *ad hoc* nature of the process, it is not surprising that objective benchmarks, standards, and regulations specific to the governing of this process do not yet exist. Absent such standards, how does a careful practitioner ensure that a collection workflow is going to be successful?

Quality-control processes employed prior to the review of ESI are an essential element of the “reasonableness” of a party’s discovery efforts; they also support a quality chain-of-custody process for purposes of tracking and documentation. Parties using a well-designed discovery methodology should be able to account, if necessary, for all of the electronic information they collect (as well as identify any potentially relevant ESI they did not collect), even though they may review and ultimately produce only a small fraction of that information. As a general proposition, these quality-control procedures have two main purposes: data accountability and anomaly detection. The complexity associated with multi-location collection from large numbers of custodians, live systems, archives, and forensic images, makes effective quality-control processes essential. Without them, parties are more vulnerable to challenges related to the omission of potentially relevant data, spoliation, conversion of data, or other issues arising in the later review and production phases of e-discovery.

The collection and culling (i.e., initial processing) of ESI can be measured and managed through the gathering and reporting of key metrics. This analysis should be applied as early in the workflow as possible, helping to communicate the details about the composition of the collected ESI. Simple metrics, such as how much and what types of data have been collected for each source, whether custodial or noncustodial, can be very helpful to the planning process.⁸⁰ This can help with early detection of potential issues such as metadata loss, encryption, corruption, unsupported or unknown file types, non-searchable ESI, and other unpredictable issues. It can also help prevent unexpected cost and burden at the time of review and production; for example, by avoiding the selection of a review tool that is unable to handle the specific languages or file types contained in the ESI.

3. Data Collection and Culling: Best Practice Guidelines

The selection, organization, and filtering of ESI through the use of objective criteria (such as date filters and file types) and, in most cases, a search protocol,⁸¹ are critical elements in reducing the volume of information to be reviewed, and thus, the time and cost of the e-discovery process. In addition, keyword search techniques are well known and may be used for this purpose with proper testing. More advanced technologies employ complex algorithms for ESI filtering and organization and may, in some cases, be useful at the collection and culling stages. Regardless of the technology chosen, all filtering methods require a well-defined process. Without these basic steps, the use of any filtering technology will likely result in gross over- or-under inclusion of responsive ESI. The process includes several steps:

- Understanding the composition of source ESI;
- Defining clear goals for the filtering process;

80 For example, if a party has collected an average of 10 GB of ESI from each of several custodians, a custodian with only 1 GB of ESI collected may stand out if he or she was expected to have the same amount. Creating a corporate- or case-level data map in the early assessment stage of a case gives counsel a framework to analyze and make comparisons of the collection metrics.

81 See *Treppel v. Biovail Corp.*, 233 F.R.D. 363, 372 (S.D.N.Y. 2006) (discussing importance of a “search protocol” in assuring a “diligent search” involving a “reasonably comprehensive search strategy”).

- Applying the filter; and
- Testing the outcome.

Understanding the composition of source ESI is critical when filtering the information. There are many possible types of documents in any given ESI collection: some documents may be handwritten; others may be written in one or more languages other than English; some may be compressed (e.g., *.zip files), encrypted, or otherwise protected; and still others may be composed of images without searchable text (e.g., electronic faxes or scanned paper documents). This may result in having to format, convert, translate, or otherwise specially process documents for subsequent filtering or review. For example, scanned paper documents must first be processed through optical character recognition (OCR) software to create searchable text. Without a well-defined process for all file types, some files may be ignored or missed during the filtering phase of the e-discovery workflow. Finally, the handling of handwritten documents should be separately addressed.

Defining clear goals for the filtering process will help achieve the intent of the filtering. First, the team needs to clearly articulate the filtering's intent – such as reduction of volume by exclusion, inclusion, organization, or classification of ESI – so that the appropriate tool can be utilized and the process can be explained.

The application and testing of any filtering process should be iterative and often may need to be repeated until the desired goals are met. It generally is not sufficient to run a filtering tool and trust that it is achieving the desired results without performing any follow-up measurement. Rather, a practitioner must evaluate the outcome of the search, looking for errors in how the filter rules were established or applied. A practitioner may use metrics, such as the number of included or excluded documents by keyword or filtering criteria, to evaluate the outcome. Examining keywords that return high and low numbers of “hits” can uncover issues with how the search was constructed, the choice of terms, or even issues with the data. For example, finding zero search “hits” on a key term or concept may point out that a search term is spelled incorrectly or was not stemmed appropriately, or that many of the documents do not contain searchable text. On the opposite end of the spectrum, finding a term that “hits” on a high percentage of the ESI may indicate that the term is too broad, or may need to be combined with additional qualifying search terms.⁸²

Practitioners also should maintain data accountability through a chain-of-custody process. An initial, important step maintains the identification of the original source of data at each stage of processing, memorializing the file location, the directory and drive mappings on hard drives, and the contents and file counts for each unique source for each custodian. Best practices would include clear documentation of both what was done and what was not done. If Internet email is not processed for review, that should be documented. If a party uses forensic tools to recover deleted emails from a custodian's mailbox, that use should be documented (including the specific tool and the results). By applying a custodian-based view to the data, the party can report the total number of items from all sources applicable to each custodian (e.g., the live email server, email archive, hard drives, network shares, and removable media). Searching the review database for all items

82 Sampling can also be useful in testing the effectiveness of filters, i.e., samples can be drawn and reviewed from both the set of documents hit by a filter and from the set excluded by a filter, so as to provide evidence as to whether the filter casts too wide or too narrow a net. Sample-based testing of filters, in which all data (filtered and unfiltered) is in-scope for testing, allows for informed, iterative development, ideally leading to more effective filters.

associated with a custodian should yield a result that matches the total number of items from the processing report.

A cornerstone of data accountability is derived by establishing the counts of files on media before processing begins.⁸³ From this defined starting point, the party should make adjustments to file counts reflecting processing results for each source:

- Elimination of system files (e.g., based on the National Software Reference Library or “NSRL” filter);⁸⁴
- Deductions for certain file types not processed (e.g., databases);
- Deductions for items that could not be processed (e.g., corrupt or virus-infected files, or documents created by proprietary software);
- Deductions for duplicates not processed; and
- Deductions for items not selected by filters.

In addition, it is also important to note files processed but not indexed, such as encrypted files or images.

The raw data regarding the electronic information is also useful for identifying anomalies in the data collected. Investigating and resolving these anomalies and exceptions in the data can serve as an additional quality-control check that may discover errors or omissions in the collection process. At a minimum, investigating anomalies may help to answer questions about the collection process that other parties or the court may have. In addition, undocumented but indexed exceptions raise a particular concern, as those items are otherwise loaded into the database and appear to be available for searching, analysis, and review.⁸⁵

Email conversion may implicate additional issues. Conversion of email from one format to another is often necessary during the collection and processing of ESI because many service providers do not natively support all email formats. Given the potential for data loss or alteration (for example, loss of formatting, metadata, etc.) arising as a result of such “conversions,” it is prudent to establish a process that will lead to a reliable and defensible result.⁸⁶

Ultimately, of course, the quality and completeness of the collection and culling phases will be directly related to the care and planning – as well as the ability to adapt to changing needs – that are built into the protocol and executed under the leadership of the Team Leader.

83 Note that file counts can, however, be misleading. Container files (e.g., PSTs) can and should be “exploded” for the purpose of fully indexing and understanding the overall data set and data profile.

84 See NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, <http://www.nsrll.nist.gov/> (last accessed Nov. 1, 2013).

85 If they are not indexed, any keyword searches performed against the data will not include those items. Therefore a review that is based, at least in part, on the results of keyword searches may overlook these items.

86 Among the questions that could be asked of a service provider with regard to email conversion are: (i) what email formats require conversion for processing; (ii) what conversion software will be used, and for what purpose was the software developed; (iii) what known limitations in the software exist, including the above-described data loss or alteration; (iv) how has the software been tested or vetted prior to selection for use, and how has the conversion process been tested or validated; (v) what is done to investigate or remediate errors; (vi) what errors are typical; (vii) does the conversion process alter date and time values; (viii) does the conversion process preserve email addresses, resolved names, entire email headers, blind copies (bcc’s), etc.; (ix) does the process retrieve email from all containers in the mail store; (x) does the conversion process handle duplicates, email threads, encrypted messages, corrupt messages, foreign languages, Rich Text (RTF) formatted emails, HTML formatted emails; and (xi) does the conversion process handle non-email objects (e.g., calendar entries, contacts, notes, etc.).

B. THE REVIEW AND PRODUCTION PHASES

1. Introduction

Producing parties review documents or ESI for relevance and responsiveness before they are produced, as well as to determine if any privilege or other exemption is applicable.⁸⁷

Effective management of the review phase requires organization and advance planning. Thoughtful structuring of the review process and coding protocols, sufficient attention to staffing, and open communication and collaboration among attorneys, clients, and legal-service providers are hallmarks of well-managed document reviews. Attention to quality control throughout the process is paramount to providing meaningful and cost-effective results.

Traditional large-scale document reviews typically have involved large numbers of individuals of varying expertise and responsibility. Leadership by individuals who will manage the diverse roles and tasks in coordination with the Team Leader (or his or her delegate) is crucial in the following respects:

- Providing clear guidelines governing “knowledge transfer” from the trial team and managers to the document review team and those assisting on a particular review project. Such guidelines also ensure an adequate “knowledge transfer” from those familiar with the documents and data, back to the trial team and senior managers;
- Developing the applicable responsiveness and privilege criteria;
- Determining search methodologies;
- Ensuring consistency, to the extent possible, especially in areas relying on human review and judgment; and
- Providing for objective quality benchmarks to measure the performance and effectiveness of the review process.

2. Using Automated Methods to Reduce the Initial Burden of Review

As discussed in connection with the collection process, and as set forth in the *Sedona Search Commentary*, there are a number of automated tools that can greatly assist in reducing the overall data universe, in at least four fundamental ways: first, by helping to identify only the portion of the universe of collected ESI that is potentially responsive, based on whatever automated search methodologies and protocols are employed; second, by de-duplicating (or tagging) identical or “near” duplicate ESI so that a particular ESI object is reviewed only once; third, by eliminating certain types of files that likely are not relevant (e.g., video and program files); and fourth, by identifying and eliminating obvious spam from the review population.⁸⁸

⁸⁷ Throughout this section, the term “privilege” is used to refer to both the attorney-client privilege and the attorney work product doctrine.

⁸⁸ See *Sedona Search Commentary*, *supra* n.25, at 245.

A number of legal-service providers now offer various forms of automated tools that can significantly reduce the number of electronic documents to be reviewed manually, by extracting the documents most likely to be responsive to a discovery request and leaving the remainder unselected and unreviewed.⁸⁹ Given the rising costs of complying with e-discovery requests, tools that enable a party reasonably, appropriately, and substantially to reduce the amount of ESI that must be reviewed by humans should be embraced by all interested parties – plaintiffs, defendants, the courts, and government agencies.

For example, to conduct an automated search process utilizing statistical sampling, the first step effectively shares and transfers knowledge among counsel, the project management team, and those with knowledge of the corpus of ESI that is the subject of e-discovery. The knowledge gained in this process is used to develop one or more search strategies (e.g., Boolean searches, concept searches, metadata filters, language-based approaches using taxonomies and ontologies, statistical “clustering” techniques, relevance ranking, machine learning, or other proprietary strategies). Once the responsive data set has been characterized, a random sample of categorized material is chosen; reviewers analyze this sample. This random sample will contain both responsive and non-responsive material, and reviewers classify these documents as they normally would in a manual review. The reviewers’ classifications are then compared to the results reached by the chosen categorization method(s). When there is a difference between the determination made by the human reviewer and the categorization method, the legal team reviews the document and decides which is correct. Adjustments are then made to the search strategy. Sometimes the differences require modifications so that a particular type of document is filtered in the future.

This iterative process of sampling and refinement is typically continued until the rate of difference between the automated methods and human review meets the acceptable threshold of accuracy defined for the project. Once it reaches that threshold, the final categorization is run on the entire data set, and the responsive documents can then be prepared for production (subject to any further privilege or other manual review deemed necessary).

Another approach employs a “blended review” process, combining the use of manual review by humans with automated software-based review. Specifically, automated tools can help reduce the workload when manual review is required. For example, where potentially privileged documents are involved, a “privilege” vocabulary identifying attorney or law firm names can be used in conjunction with a vocabulary identifying topically-relevant information. In this way, the likely privileged documents can be identified initially, and then subcategorized by relevancy, allowing the manual reviewers to start with, and focus on, the most pertinent privileged documents.

Once the ESI universe has been reduced to the population of documents that will be reviewed, there are review tools on the market that can help review teams organize and more effectively work with what still may be a considerable volume of electronic data. For example, a number of service providers offer categorization and “clustering” tools that group documents relating to the same or similar topics so they can be reviewed together – accelerating the speed of review and ensuring greater consistency in the treatment of the documents.⁹⁰ Other providers offer email threading, which likewise pulls together related

89 The magnitude of the cost reduction typically depends on the percent of responsive documents in a data population, the number of different issues relevant to the data request or subpoena, and the extent to which human review is applied.

90 See Ramana Venkata & Michael A. Geibelson, *Overcoming E-Discovery Challenges with New Technologies*, 30 L.A. LAWYER, June 2007, at 46, 46 (“Quality control measures, document organization, and batch tagging can significantly lower the cost of e-discovery and help satisfy client demands for finite, predictable e-discovery costs.”), <http://www.lacba.org/Files/LAL/Vol30No4/2388.pdf> (last accessed Nov. 1, 2013).

emails from a given email chain so they can be reviewed together – as opposed to being randomly dispersed throughout the document set and reviewed independently by different reviewers. Still other providers offer software that can rank a document collection from those documents most likely to be relevant to those least likely to be relevant, thereby allowing the legal team to focus its resources and make strategic decisions about what documents require expensive attorney review. Because many of these tools work by extrapolating coding decisions made on a sample set of documents to make predictions about the entire corpus, it generally will be important to have strong quality controls in place during the sample review.

Although all of these review tools are quite useful in reducing the time spent in reviewing ESI, in most present-day litigation there will still, to a greater or lesser extent, be a need to review manually some portion of the document population to determine responsiveness to a particular e-discovery request. Moreover, it is still common for all or some portion of the data to be reviewed a second time (i.e., by a different reviewer) for privilege, or as a quality check on the first-level review, or simply to understand the facts.

To the extent that automated search and retrieval methods are used for reducing the ESI data set to a more manageable size for purposes of review, a party may be called upon to demonstrate to opposing parties, courts, and government agencies that its chosen method and tool accurately captured a reasonable amount of the relevant, non-privileged ESI, and that the prevalence of relevant documents in the remaining, unreviewed and unproduced ESI is acceptably low. *See also* discussion, *supra*, Part II.B.3.

In citing to the *Sedona Search Commentary*, as well as to the federal government's TREC Legal Track research initiative,⁹¹ the Court in *Victor Stanley I* stated that "there is room for optimism that as search and information retrieval methodologies are studied and tested, this will result in identifying those that are most effective and least expensive to employ for a variety of ESI discovery tasks."⁹²

In addition, while the case law in this area will have to evolve to address challenges to particular e-discovery processes, parties employing these methods may support their use by citing past studies and by employing accepted statistical sampling techniques. As noted in an article summarizing legal principles related to e-discovery:

As with any technology, it is imperative to perform frequent, thorough checks to make sure that the searches are working, perhaps by using a sampling method. ... The needs of the litigation at issue should dictate what technology gets used, and how, in order to strike the optimal balance possible between recall and precision. The key to defensibility is that litigants employ these search strategies as part of a reasonable, good-faith, well-documented discovery protocol. Lawyers must understand where the search technology fits into that protocol and have confidence that they have taken measures to ensure the quality of their searches. (footnotes and internal quotes omitted)⁹³

91 *See* <http://trec-legal.umiacs.umd.edu> (last accessed Nov, 1, 2013); *see also Sedona Search Commentary, supra* n.25.

92 250 F.R.D. at 261 n.10. *See also* technology-assisted review cases cited n.51, *supra*.

93 M. Mazza, E. Quesada, A. Sternberg, *supra* n.74, at 33 (litigants looking for a "holy grail" in automated technology will not find it).

Thus, as noted earlier, sampling techniques can be used to establish, at a certain confidence level, that unreviewed and unproduced material in the form of ESI is likely to be non-responsive to a particular discovery request.⁹⁴

3. “Clawbacks,” Rule 502, and Reliance on Automated Methods

In addition to the tools and techniques set forth in Part II, growing volumes of ESI in litigation will require new, creative, and strategic approaches to efficiently manage e-discovery. Together, the “clawback” provision of amended Federal Rule of Civil Procedure 26(b)(5) (allowing for the return or “clawback” of inadvertently produced privileged materials) and Fed. R. Evid. 502 (generally immunizing parties from third-party challenges if their “clawback” agreement is included in a court order) can provide powerful protection against privilege waiver resulting from inadvertent production of privileged material in discovery. In light of these developments, and without employing labor-intensive manual review (except for spot checking for responsiveness and privilege), in appropriate circumstances, counsel may wish to assess their client’s interest in producing potentially responsive documents gathered as the result of automated search and filtering methods.⁹⁵ That is, even with a “clawback” agreement in place, a party may wish to perform sufficient sampling and other quality-control methods to reach a level of comfort on matters of relevance and privilege, but once that comfort exists, rely primarily on the automated methods to determine which documents are produced. This allows the majority of documents to be produced without exhaustive manual review, and traditional manual review will only be employed on documents initially identified through automated means as candidates to be withheld on grounds of privilege. This approach substantially reduces costs and burdens for both producing and requesting parties, and ideally, the pros and cons of such an approach should be discussed at the outset of the discovery process. Adoption of this approach does not, however, obviate the need for employment of measures of quality at every stage.

4. Quality-Control Guidelines for Responsiveness and Privilege

The use of quality-control tools throughout the review process can provide ongoing performance metrics and resolve potential ambiguity in training and instructions. Indeed, when quality checking is combined with training, a resource-intensive review process can be made much more efficient by improving the quality of initial reviews with iterative feedback.

In traditional document review, there are two basic approaches to quality checking first-level reviewers’ coding decisions when dealing with ESI. One approach is to have a second level of review performed – by a senior lawyer or using trained computer software – on some or all of the coded ESI. Another is to run statistical analyses of coded documents to check for consistency across reviewers, and then conduct a targeted, second-level review only where there are unexplained statistical variations.

⁹⁴ The same techniques can be used to determine, at a certain confidence level, that the produced documents are, in fact, relevant.

⁹⁵ See generally Advisory Committee Note to FED. R. EVID. 502: “Depending upon the circumstances, a party that uses advanced analytical software applications and linguistic tools in screening for privilege and work product may be found to have taken ‘reasonable steps’ to prevent inadvertent disclosure”; see also *Rhoads Indus., supra*, n.57 (citing to Advisory Committee Note).

However, as recent research⁹⁶ and common sense confirm, members of any legal team can disagree on relevance assessments of specific ESI. The standard for first-level reviewers (often contract attorneys) should therefore never be perfection, especially given that “reasonable minds” can differ on exactly what is or is not relevant to a particular request. To further enhance the quality of first-level review, guidance should continually be refined to assist the reviewers in getting at least the “easy” documents correct, and in coming as close as possible to the desired result on “close-call” determinations.

Review for privilege can require an even more nuanced legal analysis and, as such, can be more expensive per document than review for relevance or confidentiality. Complexities include, for example, the use of email chains and internal legal department communications.⁹⁷ Incorporating processes that safely minimize the number of records being reviewed for privilege will lead not only to a more efficient, cost-effective review, but also to faster turnaround for production and higher quality privilege logs. These processes might include:

- Creating a “potentially privileged” set of documents that obtains more scrutiny from more experienced reviewers. This can involve the use of file extensions, document, sources, keyword searches, metadata filters, and any internal designations of privilege. (Note, however, that all footers can contain the words “confidential” or “privileged.”)
- Identifying structured data sources containing data that is never in the hands of an attorney and is not created for any litigation purposes. However, companies and counsel need to be aware that such data sources may contain information that is nonetheless prohibited from disclosure by operation of law, regulation, contract, or that is confidential or proprietary for other reasons.⁹⁸

Quality control is a constant process throughout the production phase of litigation. After the review of an initial subset of ESI has been completed and all reviewers are deemed to be performing adequately, the team should implement a quality-control protocol to apply on a going-forward basis. This protocol should be adjusted to accommodate the reviewers’ growing understanding and new developments in the case.

For example, the system should address the percentage of ESI checked, as well as the methods for selecting ESI to be checked. It is not always necessary for a team to review 100% of the responsive ESI population a second time; instead, sampling measures may be appropriate. To guard against inadvertent production of privileged ESI, in some reviews, a complete check is made of ESI with attorney names (and/or other terms commonly

96 Research shows substantial variance in how human subject volunteers “assess” relevance or non-relevance in response to a hypothetical production requests under FED. R. CIV. P. 34. See generally Maura R. Grossman and Gordon V. Cormack, *Technology-Assisted Review in E-Discovery Can Be More Effective and More Efficient Than Exhaustive Manual Review*, 17 RICH. J.L. & TECH. 11 (2011); Maura R. Grossman and Gordon V. Cormack, *Inconsistent Responsiveness Determination in Document Review: Difference of Opinion or Human Error?*, 32 PACE L. REV. 267 (2012); Jason R. Baron, David D. Lewis, & Douglas W. Oard, *TREC 2006 Legal Track Overview*, Fifteenth Text Retrieval Conference (TREC 2006) Proceedings, available at <http://trec.nist.gov/pubs/trec15/papers/LEGAL06.OVERVIEW.pdf> (last accessed Nov. 1, 2013).

97 See, e.g., *Muro v. Target Corp.*, 243 F.R.D. 301 (N.D. Ill. 2007) (intermingling of non-privileged communications with privileged communications in an email chain); *In re Vioxx Prods. Liab. Litig.*, 501 F. Supp. 2d at 815 (adopting Special Master Report involving review of in-house lawyer communications); *Victor Stanley I*, 250 F.R.D. at 262 (failure to carry burden of excusing inadvertent production of privileged documents because of lack of demonstration of, *inter alia*, “quality-assurance testing”).

98 Where parties or their counsel are unwilling or unable to determine that a group of records are completely barren of privileged material, they may wish to consider an offer to produce these documents under a “quick peek” agreement.

associated with privileged documents). Prudence also suggests close checking of the ESI in the production queue that originates from the files of custodians known to work closely with attorneys.

Consistency checking may assist practitioners in evaluating the review. Every discrete object in the review population should ultimately be coded as responsive or not. Accordingly, a check can be done to locate any ESI that exists in the database without the requisite coding. Rather than waiting until the end of the review, this check can be done on a rolling basis as the review proceeds (e.g., at the conclusion of review for each relevant custodian). In addition, consistency in coding across like documents is important; and practitioners should adopt measures to ensure, or at least increase the likelihood, that duplicate or near-duplicate documents are being coded in the same fashion.

Practitioners also should identify other inconsistent combinations, and regularly search the database for such errors, both to correct them and to determine their source so as to correct course and avoid creating more errors. Listed below are a few examples of consistency searches, with the caveat that they will necessarily vary from review to review:

- ESI coded as responsive without coding for potential privilege (where known subsets of the population are considered privileged);
- ESI coded as potentially privileged without coding for privilege type;
- ESI coded as non-responsive and noteworthy;
- ESI coded as non-responsive and potentially privileged;
- ESI coded as in need of redaction, but no redaction has been applied.⁹⁹

Additional common practices for quality control during the review process include:

- Comparing coding among reviewers on a common subset of ESI and providing individual or group feedback following the results;
- Developing a system for early review and assessment before reviewers get too far into review (e.g., the first 100 coded ESI objects are automatically sent to the second-level review team for assessment);
- Selecting a group of documents by running a search by reviewer, specifically targeting codes that will give a broad idea of how each reviewer is handling certain codes;
- Analyzing the daily tracking sheet (i.e., data log) and/or service provider software-generated statistics to identify the frequency of second-level changes to first-level reviewers' coding decisions, and targeting areas of frequent disagreement;
- Conducting early assessment of ESI marked "privileged" to identify any misunderstandings about privilege, and if necessary, providing feedback;

⁹⁹ State-of-the-art review platforms offer support for structures – such as mutually exclusive tag groups – that help enforce these consistency rules during the review process. As they evolve, they may be support for many more such structures (“if it gets this tag, it must also have this one”) that make it easier for inconsistencies to be identified. When available, these should be understood and fully utilized in the design of the review.

- Conducting detailed quality review of “potentially noteworthy” ESI;
- Conducting detailed quality review of key custodians or high-level custodians (e.g., the CEO) to assess the need for early client feedback;
- Running tests to identify logically inconsistent coding (e.g., a “responsive” tag but no responsive coding category or issue tag is selected);
- Tracking rates of review (i.e., the time taken per reviewer per document), and investigating any outliers compared to peer reviewers;
- Gathering metrics on the overall review process itself, including ESI or documents reviewed per hour, “pages” per hour, sampling for congruence, and total costs.

The hosting service provider and/or litigation support project manager can assist with statistical tracking of review efforts (both for substance and pace) for all levels of review. Service providers offer different options for review tracking and can provide reports that track, among other things, the number of “pages” reviewed, the number of ESI objects coded with a particular tag, the hourly average of “pages” reviewed, and the number of times second-level reviewers change the coding of a particular first-level reviewer.

At least three additional types of quality issues may arise in connection with document review:

- Review of data “exceptions.” It is not unusual for different providers and software applications to have difficulty processing obscure, password-protected, encrypted, or corrupted records in the data set. Some data may also be unreadable, for example, characters may be scrambled or random. Service providers typically refer to such documents as “exceptions.” Service providers should be able to provide “exception reports” regularly throughout the review and address these issues on an ongoing basis.

Because exceptions can take considerable time to resolve, waiting until the end of the review to address these files can be a mistake because it can interfere with timely production. If the provider is not able to remedy the problem, third-party consultants may be called in to process the data with different tools. Some password-protected materials can be “cracked,” and others may need to be returned to the client for input. Finally, the content of the exception data should be considered. If it can be determined from the file name or type that it is not likely to contain relevant information, a party should consider whether to inform the opposing party or government agency that the file will not be processed further.

- ESI in foreign languages. Another category of ESI that would commonly be set-aside during review is foreign-language materials. It may be necessary to obtain translations (informal translations using Internet tools may suffice for the purposes of preliminary

review), so time should be built into the production schedule to get these materials translated, reviewed, coded, and processed for production, as required.

- Loose electronic media. If certain types of media have not been made part of the primary review database (such as video or audio tapes, disks, DVDs, CDs, etc.), it is important to build time into the review schedule for review of those materials prior to the final production.

5. Preproduction Quality Checking

Practitioners should employ both preproduction cleanup measures and additional quality-assurance checks, as warranted. Once the review of a set of documents and ESI is complete, the service provider and the team should perform preproduction tasks and conduct final quality checks to ensure that the documents are properly queued, numbered, and labeled for transfer to the final production medium. Although many teams implement quality-control measures throughout the review process, it is important to develop a plan for a final quality review of the preproduction set, which can include performing an appropriate analysis to verify that all ESI coded as responsive and not privileged has been queued for inclusion in the production. This review might also include checking for:

- Inadvertent production of privileged ESI, to ensure that no documents marked “privileged” have been loaded onto the production media. The team may also want to run relevant attorney names or “potentially privileged” terms through the preproduction set as a final check. It is important that the team verify that redactions are properly applied in all production formats.
- Non-responsive ESI, to ensure that no non-responsive data has been loaded onto the production media.
- Inconsistent or illogical coding of ESI, to identify all documents containing inconsistent or illogical coding (e.g., the reviewer checked a responsive issue tag and also checked “non-responsive”).
- Data formats and labeling, to confirm that all data on the production media has been loaded in the required or agreed-upon format.¹⁰⁰ Care should also be taken to ensure that the documents on a disk or other production media are properly labeled, including any necessary confidentiality or FOIA designations, and that the disks or other production media themselves are also properly labeled for production.

6. Final Quality Checking at Production

While quality checking should be undertaken at each stage of the review process, a final check is appropriate prior to production:

- Checking to confirm that the number of files being produced matches the expected number of files (i.e., file count and

¹⁰⁰ The service provider should also check the production media to ensure that all data will be readable and that no data has become corrupted.

reconciliation), to protect against the inadvertent inclusion of extra (possibly hidden) files.

- Each production to opposing counsel should be quality checked to ensure that no materials designated as privileged or otherwise protected against disclosure were accidentally included in the production. Quality checking can include:
 1. Random spot checking of the production and re-review of particular records;
 2. Re-running keyword searches over the production similar to those used in creating the “potentially privileged” set. Documents returned by the search can be re-examined to ensure they are not privileged; and
 3. Running data format or pattern searches over the production to find potentially unredacted, but protected, personal information (e.g., a search for “###-##-####” to detect Social Security numbers).
- Where structured data is being produced, samples of the production set should be reviewed in the format in which it is being produced, to ensure that the correct data fields are present and that any fields that were redacted are not included in the production.

As a final note, to the extent possible, the legal team should organize its review in advance so that objective data (e.g., authors, recipients, dates, etc.) can be automatically populated into privilege logs. Contemporary review tools can support this process to a considerable extent, greatly simplifying the process of generating privilege logs. Such information, however, should be reviewed for accuracy and completeness.

CONCLUSION

“The future is already here – it’s just not evenly distributed.”¹⁰¹

Tremendous growth in the volume and complexity of ESI, and increasing scrutiny of the e-discovery process by opposing parties and the courts, bring with them increased risk of spoliation sanctions that compel the legal profession to implement best practices to achieve greater quality in all phases of the e-discovery process, including in its collection, culling, review, and production phases. In today’s legal environment, using project management, measures of quality, and statistical sampling, are some of the ways in which to adopt lean, efficient and smart business practices. Put another way: just as Moneyball¹⁰² demonstrated the value of applying new statistical measures to assess baseball talent (even while running counter to “tried and true practices” based on intuition and culture), this

101 William Gibson, quoted in THE ECONOMIST (Dec. 4, 2003).

102 See Michael Lewis, MONEYBALL: THE ART OF WINNING AN UNFAIR GAME (2003). For a good summary of the book’s thesis, see <http://en.wikipedia.org/wiki/Moneyball> (last accessed Nov. 1, 2013).

commentary posits that legal practice needs to incorporate the best thinking from other disciplines – even if lawyers need to learn new techniques, and even if some of the “mystique” of legal work is left behind.¹⁰³

In the end, cost-conscious firms, organizations, and institutions of all types that are intent on best practices and overburdened judges will demand that parties undertake new ways of thinking about how to solve e-discovery problems – including employing better project management and better measures of quality to achieve optimum results, as outlined in this commentary. The technical and project management-oriented quality processes discussed here (as well as others) should be incorporated into every litigator’s continuing education and daily practice.

These processes also dovetail with, and support, *The Sedona Conference Cooperation Proclamation* – which calls for incorporation of the best thinking of “disciplines outside the law” to achieve the goal of the “just, speedy, and inexpensive determination of every action and proceeding.” In the end, striving to attain a quality outcome in the conduct of litigation is consistent with the highest ethical calling of the legal profession.

103 See also Ian Ayres, *SUPERCRUNCHERS: WHY THINKING BY NUMBERS IS THE NEW WAY TO BE SMART* (Bantam Dell 2007). Ayres, a Yale Law School professor and econometrician, writes:

We are in a historic moment of horse-versus-locomotive competition, where intuitive and experiential expertise is losing out time and time again to number crunching. In the old days many decisions were simply based on some mixture of experience and intuition. Experts were ordained because of their decades of individual trial and error experience. We could trust that they knew the best way to do things, because they’d done it hundreds of times in the past. Experiential experts had survived and thrived. If you wanted to know what to do, you’d ask the grey-hairs. Now something is changing. Business and government professionals are relying more and more on databases to guide their decisions.

For a general overview of the growing field of analytics and business intelligence, see Thomas H. Davenport & Jeanne G. Harris, *COMPETING ON ANALYTICS: THE NEW SCIENCE OF WINNING* (2007).

APPENDIX: SAMPLING 101 FOR THE E-DISCOVERY LAWYER

The basic concept of sampling certain items from a population to better understand the characteristics of the whole population is simple and straightforward. Sampling is a familiar concept that is accepted by most people, including those tasked with reviewing electronic documents for responsiveness, and privilege. The application of sampling that most people are probably familiar with is with polling in national elections. Pollsters sample only a very, very small percentage of the voting public, but must take great care so as to ensure that the small number they are polling constitutes a genuinely representative sample of the entire population. On the basis of such a small but representative sample, the pollsters can predict:

- What percentage of voters would vote for a particular candidate;
- What the margin of error of the poll is (in statistical parlance, this is known as the “confidence interval”); and
- How certain they are that this result would hold up – within the margin of error – when applied to the population at large. (This is known as the “confidence level.”)

But mention “statistical sampling” in most other contexts and there is such apprehension about the process and the math involved, that, at least until very recently, statistical sampling was rarely used or cited in assessing the quality and consistency of the electronic document review process. Ultimately, lawyers are left in an unfortunate situation, since the document review process is well-suited to the application of statistical sampling to improve quality and reduce cost.

This section seeks to demystify the basics of statistical sampling and to explain how it can be effectively applied to a typical, large electronic document review process.

Some Basic Terms*Sampling: Judgmental (Nonprobabilistic) Versus Statistical*

Sampling involves the use of a subset of a population to estimate one or more characteristics of the whole population. Probability, statistical, or random sampling, is a sampling technique in which the probability of getting any particular sample may be calculated. “Judgmental” or “nonprobability sampling” does not meet this criterion – thus, judgmental sampling techniques cannot be used to infer from the sample to the general population. Any generalizations obtained from a nonprobability sample must be filtered through one’s knowledge of the topic being studied. Performing nonprobability sampling is generally considered less expensive than doing probability sampling, but the results are of more limited value.

Examples of Nonprobability Sampling Include:

Judgmental sampling: Sampling performed on a sample set that was selected based on the judgment of the person doing the sampling. For example, a researcher chooses the sample based on who or what they think would be appropriate for the study, as in conducting an isolated case study of just one group or making choices based on relationship proximity, not science. A common example in the e-discovery context would be keyword searching itself,

which is a technique universally used by lawyers and legal professionals to cull a set of data, based on the *a priori* judgment of those selecting the keyword terms.

Examples of Statistical Sampling:

“Random Sampling” A sample is a subset chosen from a population for investigation. A random sample is one chosen by a method involving an unpredictable component. Random sampling can also refer to taking a number of independent observations from the same probability distribution without involving any real population. A probability sample is one in which each item has a known (and equal) probability of being in the sample.

The sample will usually not be completely representative of the population from which it was drawn – this random variation in the results is known as “sampling error.” In the case of random samples, mathematical theory is available to assess the sampling error. Thus, estimates obtained from random samples can be accompanied by measures of the uncertainty associated with the estimate. This can take the form of a standard error, or if the sample is large enough for the central limit theorem to take effect, confidence intervals may be calculated.

A simple random sample is selected so that every possible item has an equal chance of being selected from the population.

A “self-weighting sample,” also known as an “Equal Probability of Selection Method (EPSEM) sample,” is one in which every individual, or object, in the population of interest has an equal opportunity of being selected for the sample. Simple random samples are self-weighting.

“Stratified Sampling” involves selecting independent samples from a number of subpopulations, groups, or strata within the population. Great gains in efficiency are sometimes possible from judicious stratification. An example of this would be varying the sampling percentage based on document type.

“Cluster Sampling” involves selecting the sample units in groups. For example, a sample of telephone calls may be collected by first taking a collection of telephone lines and collecting all the calls on the sampled lines. The analysis of cluster samples must take into account the intra-cluster correlation, which reflects the fact that units in the same cluster are likely to be more similar than two units picked at random.

Additional Common Sampling Terminology:

“Blind Sample” is a selected sample whose composition is unknown except to the person submitting it. This type of sample is used to test the validity of the measurement process.

“Acceptance Sampling” is a statistical procedure used for accepting or rejecting a batch of merchandise or documents. Acceptance sampling involves determining the maximum number of defects that may be discovered in a sample before the entire batch is rejected.

“Confidence Interval” is the range that contains the true population value estimate a specified percentage of the time, if repeated sampling of the population were to be performed. For example, a 95% confidence interval is a range that contains the true population value 95% of the time. A smaller range indicates an estimate that is more precise. Small sample sizes or cells with low numbers generate less precise estimates and will have wider confidence intervals.

“Confidence Level” is a statistical measure of the number of times out of 100 that the results measured will occur within a specified range. That is, a confidence level of 95% indicates that the result of an action will likely meet the expectations of the observer 95% of the time.

Statistical Sampling Basics

There are three key factors that determine the reliability and precision of the inferences that can be drawn about a population based on a statistical sample:

1. The **randomness** of the sample selection;
2. The **variability** of the sample results; and
3. The **sample size**.

One expects a properly-drawn, random sample to be representative of the population from which it comes, but any estimate based on the sample will naturally differ to some extent from a corresponding measurement based on the whole population. One expresses the likely extent of difference by presenting a confidence interval, i.e., a 95% confidence interval, around the estimated value. One will have confidence that the true value computed from the whole population would fall within the confidence interval 95% of the time. That is, if one draws samples over and over and computes estimates and intervals in the same way, one will be capturing the true value within the confidence interval 95% of the time.

The variability of the sample results affect how precise one can be in describing the true population values. This sampling variability is summarized by the quantity called the “standard error,” which is used in the construction of confidence intervals. One may say, “the population contains X% items, + or – Y%,” when X is the estimated value and Y is its standard error. In many cases, a confidence interval stretches about two standard errors above and below the estimate.

A simple sampling example might help to illustrate these concepts more effectively. If one were to reach into a backpack full of coins, mix them up thoroughly, and then pull out a single handful of all pennies, one might naturally believe that the bag contains all pennies based on the single handful that had been directly examined. However, a confidence interval for the proportion of pennies would stretch from zero percent to some low, but non-zero percent, depending on how many coins there were in the handful. The thorough mixing of the bag’s contents helps to achieve the randomness of the sample selection. However, the bag might well contain 2% dimes, and a handful-sized sample might happen by chance not to scoop up any of the dimes. The width of the confidence interval expresses this uncertainty.

This example is simplistic and it is easy to imagine dumping out the contents of the entire bag to confirm the inference based on the relatively random sample of one handful from one bag. But how sure can one really be of the remaining contents of the bag based on looking at a single handful of pennies? There would always be some doubt about the remaining contents of the bag. What if the handful of coins included several different denominations instead of all pennies? What could be said about the bag's contents then? And what if there were hundreds or thousands of bags full of coins? And, what if samples taken from a number of them yielded an assortment of coins instead of all one denomination? Making an inference about the contents of all of the bags, and perhaps the value of the all the coins in all of the bags combined, becomes a more challenging problem, but one that has been largely solved by statistics, as long as the objective is to get a reasonable estimated value for the population and not necessarily the exact value.

The mathematical formulae used in statistical sampling provide reliable, quantifiable estimates for making statements or inferences about a population based on the sample results. And, the less variability found in the sample results, the narrower a confidence interval can be, keeping the same level of confidence. Together, the variability of the sample results and the size of the sample are the two critical determinants of how wide a 95% confidence interval will be. With a larger sample, we can have a tighter interval within which we are confident of capturing the true value. But uncertainty decreases slowly with sample size. We must quadruple the size of the sample to halve the width of a confidence interval.

Since the basic concept of sampling is relatively simple, why is the application of sampling in the realm of document review so challenging to implement? Perhaps it is because of the perceived high level of risk of getting the "wrong" answer about any single item or document in the population. Building on the previous example, it seems that the approach of dumping out all the bags and examining all their contents would lower the risk of missing a few gold coins that might not be predicted or detected by sampling from the population. When performing document review for a legal proceeding, the attorneys involved will typically take an analogous approach by gathering all the documents and files from selected individuals and reviewing all that contain certain keywords. This approach should lower the absolute risk of missing a "smoking gun" or "privileged" document that could dramatically affect the outcome of the matter involved.

Since sampling can typically achieve only a "reasonable" rather than an "absolute" level of confidence about the entire population, it is often considered to be unsuitable for determining whether a group of documents contains any that are privileged or responsive. Presumably, the only way to determine whether documents are privileged or responsive is to look at them all and have the reviewers identify those that are privileged or responsive. But because the reviewers are only people, and people make mistakes, it makes sense to test their work for accuracy and consistency.

Sampling can be a very efficient method of determining whether or not reviewers have achieved the necessary and acceptable level of quality and consistency in their work. There are two distinct approaches to sampling to find the proportion of correctly marked documents in the population. The first involves process sampling for acceptance, based on an approach that examines or inspects documents selected from in-process batches. The second, quality-control testing, is performed by selecting a random sample from the entire population. Both of these methods can, in theory, be applied to a document review project.

The number of items to be tested or inspected is referred to as the sample size. The overall number of sample items selected from the entire review population for quality-control testing will typically be less than the sum of the individual samples drawn to test in-process review batches. However, the benefit of testing individual review batches is that the review process can be adjusted to improve quality as the review is performed, thereby increasing the likelihood that the overall population will meet the established “acceptable quality limits” when the process is completed.