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# Manual for Complex Litigation - Sections on Computer-Related Evidence, 1 Computer L.J. 725 (1978)

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# MANUAL FOR COMPLEX LITIGATION—SECTIONS ON COMPUTER-RELATED EVIDENCE*

*The Manual for Complex Litigation is a collection of suggested procedures for the handling of complex cases. It is intended to provide judges with guidelines and suggested procedures for the handling of difficult, lengthy and complicated cases. One section of the Manual considers the problems presented by computer-related evidence, and provides an analysis and series of recommendations for dealing with the discovery and use at pretrial and trial of such evidence. While the Computer/Law Journal normally does not reprint articles from other sources, the editors believe that the following materials are important enough, and will have a major impact on the development of laws, both state and federal, in this area, that they should be given as wide a dissemination as possible.*

The spectacular developments in the use of computers in the fields of science, industry, government and the professions have created unanticipated problems in the discovery and reception in evidence of computer processed data. Because electronically recorded and processed data often must be specially treated and analyzed well in advance of trial in order to insure that it is used fairly, to allow opposing counsel to ascertain its reliability, and to avoid surprise and delay, it is important that the possibility of computer evidence be disclosed to the court and counsel at the earliest possible time. Therefore, at this stage of the pretrial preparation the court should, on the record, explore the possibility of the use of electronically processed evidence at the trial, in order that efficient and just pretrial orders concerning its discovery and use at pretrial and trial may be entered. See the immediately following discussion, in

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§ 2.71 to § 2.717, of "Proof of Facts in Complex Cases," including a discussion of computer evidence.

**2.71 Proof of Facts in Complex Cases.**

*Introduction*

This section of the Manual contains a discussion of some of the more difficult problems of proof in complex cases. The solutions of some of these problems are found both in proven techniques of long standing and in recently evolved techniques and procedures which have been devised to solve the new problems created by revolutionary developments of knowledge and technology.

The employment by businesses and professions of electronic means of recording and retrieving large masses of data, of summarizing and drawing conclusions from such masses of data and the employment by businesses and professions of samples, polls, surveys, and sophisticated statistical analyses to ascertain facts have resulted in novel problems of proof in complex cases, as well as in some simple cases. For instance, electronically processed data may be offered to prove the state of accounts, or the existence of material economic conditions in a major business, industry or science. Further, the results of recognized methods of employing samples, polls and surveys, accepted as reliable in business and in science, may be offered in evidence as proof of facts concerning the whole of the universe to which they relate.

Skilled witnesses qualified to offer opinions upon material matters in controversy employing these new and the other older proven methods of ascertaining facts and arriving at conclusions present new as well as old problems of proof.

The gap between the competence of the juror, the bench and the bar, on the one hand, and the competence of the men and machines employed by business and science to ascertain facts and draw conclusions, on the other, has been growing wider. The purpose of the discussion in this section of this work is to recount old and new ideas, techniques and procedures designed to assist in narrowing these gaps in the interest of efficient administration of justice. Under the provisions of Rule 1006 of the new Federal Rules of Evidence, the "contents of voluminous writings, recordings, or photographs which cannot conveniently be examined in court may be presented in the form of a chart, summary, or calculation. The originals, or duplicates, shall be made available for examination or copying, or both, by other parties at a reasonable time and place. The judge may order that they be produced in court." In complex cases, it is necessary to make pervasive use of summaries during the dis-

covery period as well as in the trial of the case. Early and effective use of summaries may result in many foreshortenings of what otherwise might be nearly interminable periods of discovery.

> **2.711 First Recommendation:** Voluminous or complicated data of an admissible character should be presented, whenever possible, through written or oral summaries, tabulations, charts, graphs or extracts. The underlying data, together with the proposed exhibits or summary testimony, should be made available to opposing counsel sufficiently in advance of the time they are to be offered to permit all objections to be raised and, if possible, resolved prior to the offer. Underlying data should not in the ordinary case be placed in evidence.

It is often possible to eliminate bulky documentary evidence from the record by utilizing oral or written summaries, tabulations, charts, graphs or extracts. The judge and counsel should be alert for areas where such summarization is possible, if the opposing parties have had adequate and reasonable opportunity to test the authenticity of the underlying data and the fairness and accuracy of the summary and have raised no objection on these grounds. If objections are made, they should, whenever possible, be disposed of prior to the time when the summarization is offered into evidence. Only such of the underlying documents as is necessary to preserve the objections raised should be made part of the record.[212]

> **2.712 Second Recommendation:** Scientifically designed samples and polls, meeting the tests of necessity and trustworthiness, are useful adjuncts to conventional methods of proof and may contribute materially to shortening the trial of the complex case.[213]

Both samples and polls are methods of survey research

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[212] Prettyman Report, 13 F.R.D. 62, 77-78 (1952). A more comprehensive statement on this subject is found in the 1958 Streamlining Report, 13 A.B.A. Antitrust Sec. Rep. 183, 208-211 (1958).

[213] The results of reliable samples and polls are admissible in evidence under Rule 703 of the new Federal Rules of Evidence as "[t]he facts or data . . . upon which an expert bases an opinion" and which need not be independently admissible in evidence if "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject." This rule "offers a more satisfactory basis [than formerly existed] for ruling upon the admissibility of public opinion poll evidence. Attention is directed to the validity of the techniques employed rather than the relatively fruitless inquiries whether hearsay is involved." Advisory Committee's Note, 51 F.R.D. 404 (1971). The proper use of samples and polls as a means of facilitating proof in protracted litigation is receiving increased attention and has great potentiality. Because there are a number of critical factors that must be considered in

designed to obtain a result applicable to the entire universe by examining representative portions thereof and projecting the results.[214] For clarity of discussion, "sample" is used herein to designate the physical examination of parts to establish the character of the whole, i.e., personal examination by the sampler of objectively observable facts such as, for example, a count of units or the results of test borings.[215] On the other hand, a "poll" (or opinion survey), as used herein, refers to the interrogation of part of the population whose views or attitudes are deemed relevant to the litigation.

Thus, for present purposes, a sample is confined to observable facts, whereas a poll may involve the reporting by interviewees of (1) what they have seen, think, do or believe, or (2) why they think, act or believe in a certain way.

Scientifically designed samples and polls have received increasing acceptance in recent years in government and industry.[216] The important question to be considered in a given case is whether the contemplated or proffered sample or poll is admissible under existing rules of evidence.

The principal objection to the admission of both samples and polls has been that such evidence is hearsay. Even prior to the adoption of the new Federal Rules of Evidence, some courts had admitted samples and polls over the hearsay objection on the ground that surveys are not hearsay[217] or on the ground that surveys are

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determining the propriety of a sample or poll in a given case, this Manual treats the subject in some detail.

[214] "The universe or population—the terms are used synomymously [*sic*]—is defined as the aggregate of all elements whose characteristics are to be estimated." Barksdale, The Use of Survey Research Findings as Legal Evidence 17 (1957).

[215] Cf. *United States v. Aluminum Co. of America*, 35 F.Supp. 820, 824 (S.D.N.Y. 1940). Research practitioners define sampling more broadly: "A sample survey, as the term is used in this study, refers to a systematic process of collecting information about a small group of elements (human beings or inanimate objects) chosen from a larger group of elements, or universe, for the purpose of estimating particular characteristics of the universe . . . . A census survey is a complete enumeration of all the elements in the universe." Barksdale, *supra* note 214.

[216] See, e.g., U.S. Board of Governors of the Federal Reserve System, Consumer Instalment Credit, Part IV, Financing New Car Purchases (1957). Such surveys usually are based upon "probability sampling," a system under which every unit or person in the universe has a known chance of being included. In this type of survey, the results, by application of statistical principles, may be projected to the universe with a known margin of "sampling error." This kind of error is to be distinguished from "error in sampling" which is caused by improper, i.e., biased selection of the sample (see Barksdale, *supra* note 214, at 24-25, 33, 153).

[217] *United States v. 88 Cases, More or Less*, 187 F.2d 967, 974 (3d Cir. 1951), cert. denied 342 U.S. 861, 72 S.Ct. 88, 96 L.Ed. 648 (1951), *Household Finance Corp. v. Fed-*

within a recognized exception to the hearsay rule.[218] Under the new Federal Rules, the results of polls and samples otherwise admissible are admitted as facts which provide the basis of opinion, without regard to whether they are hearsay, depending only upon the "validity of the techniques employed" in arriving at the results.[219]

(a) Samples. When a sample is offered through the testimony of the sampler, the report on the sample examined (*i.e.*, on the count of units or the test borings in the examples noted above) usually does not involve hearsay.[220] In order to project this report, however, the burden of proof rests upon the offeror to show that the sample was selected in accordance with accepted principles of sampling so that it properly represents the universe.[221] Once this is established, there remain only questions of relevancy, materiality and weight.

The same reasoning applies to the type of survey in which a series of witnesses are chosen from selected portions of the universe to testify as to the particular facts in issue with which each is famil-

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*eral Finance Corp.*, 105 F. Supp. 164 (D. Ariz. 1952); *People v. Franklin National Bank*, 200 Misc. 557, 105 N.Y.S.2d 81 (Sup. Ct. 1951), rev'd, on other grounds 281 App. Div. 757, modified 305 N.Y. 453, 113 N.E.2d 796 (1953), rev'd on other grounds 347 U.S. 373, 74 S.Ct. 550, 98 L.Ed. 767 (1954); *Zippo Mfg. Co. v. Rogers Imports, Inc.*, 216 F. Supp. 670 (S.D.N.Y. 1963), a scholarly opinion by Feinberg, J.

218 *Miles Laboratories, Inc. v. Frolich*, 195 F. Supp. 256 (S.D. Cal. 1961), affirmed per curiam, 296 F.2d 740 (9th Cir. 1961), cert. denied 369 U.S. 865, 82 S.Ct. 1030, 8 L.Ed.2d 84 (1962); *Marcalus Manufacturing Co. v. Watson*, 156 F. Supp. 161 (D.D.C. 1957), *affirmed* 103 U.S. App. D.C. 299, 258 F.2d 151 (1958). Other cases have admitted survey evidence without stating the grounds on which it is admitted. See e.g., *Sunbeam Corporation v. Sunbeam Furniture Corp.* 134 F. Supp. 614 (N.D. Ill. 1955), *Zippo Mfg. Co. v. Rogers Imports, Inc., supra* note 217.

219 See note 213, *supra.*

220 Whenever documents are examined to determine the truth of the assertions made outside of court, the hearsay problem is raised. In most instances these documents will probably fall within one of the recognized exceptions to the hearsay rule (e.g., business records). However, where they do not, the situation is analogous to that of hearsay polls which are considered below. See Sprowls, The Admissibility of Sample Data into a Court of Law. A Case History, 4 U.C.L.A.L. REV. 222 (1957); McCoid, The Admissibility of Sample Data into a Court of Law: Some Further Thoughts, 4 U.C.L.A.L. REV. 233, 236 (1957).

221 Standards for probability samples have been established by the Munitions Board Standards Agency of the Department of Defense and by the American Society for Testing Materials, Barksdale, *supra* note 214, at 122. In at least two unusual situations the subsequent taking of a complete census of the previously sampled or polled universe has afforded an opportunity to check the accuracy of the earlier sample or poll. In both instances the results were within one per cent of the sample or poll results. See Sprowls, *supra* note 220, at 229, and *National Dairy Products Corp.*, F.T.C. Dkt. No. 6175, Record, pp. 6591-6593.

iar.[222] An important question is whether the selected witnesses collectively have been chosen by proper sampling methods so as to justify the inference that their testimony accurately reflects the testimony which would have been given by the universe as a whole.

(b) Polls. As noted above, polling, unlike sampling, involves the ascertainment of facts by interrogating others on their observations, actions, motivations or beliefs.[223] Sometimes, as a matter of substantive law, what is said by an interviewee may be relevant and admissible not for the truth of the statement but as evidence of a state of mind, such as the reaction of members of the public to a particular product. Thus polls have been held admissible to prove statements of interviewees as evidence of state of mind in unfair competition,[224] and antitrust cases.[225]

On the other hand, polls may also be offered to prove the truth of the assertions made by the interviewees and thus are hearsay,

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[222] This was the type of survey approved by Judge Wyzanski in *United States v. United Shoe Machinery Corp.*, 110 F. Supp. 295, 305-307 (D. Mass. 1953), affirmed, 347 U.S. 521, 74 S.Ct. 699, 98 L.Ed. 910 (1954).

[223] The poll, like the sample, is an attempt to derive from a part of the universe facts which are properly projectable to the entire universe. However, for the purposes of this report, the basic differences between the two lie in the methods by which the desired information is obtained.

[224] See *United States v. 88 Cases, More or Less*, 187 F.2d 967 (3d Cir. 1951), cert. denied 342 U.S. 861, 72 S.Ct. 88, 96 L.Ed. 648 (1951); *American Cooperative Serum Ass'n v. Anchor Serum Co.*, 153 F.2d 907 (7th Cir. 1946), cert. denied 329 U.S. 721, 67 S.Ct. 57, 91 L.Ed. 625 (1946), rehearing denied, 329 U.S. 826, 67 S.Ct. 182, 183, 81 L.Ed. 701, 702 (1946); and *Landstrom v. Thorpe*, 189 F.2d 46, 26 A.L.R.2d 1170 (8th Cir. 1951), cert. denied, 342 U.S. 819, 72 S.Ct. 37, 96 L.Ed. 620 (1951). *Contra, Elgin Nat. Watch Co. v. Elgin Clock Co.*, 26 F.2d 376 (D. Del. 1928); *John B. Stetson Co. v. Stephen L. Stetson Co.*, 85 F.2d 586 (2d Cir. 1936), cert. denied, 299 U.S. 605, 57 S.Ct. 232, 81 L.Ed. 446 (1936); *Tri-State Broadcasting Co. v. Federal Communications Comm'n*, 68 U.S. App. D.C. 292, 96 F.2d 564 (D.C. Cir. 1938), appeal from order of Federal Communications Commission granting application dismissed. 71 U.S. App. D.C. 156, 107 F.2d 956 (D.C. Cir. 1939); and Pattishall, Reactions Test Evidence in Trade Identity Cases, 49 Tr. Rep. 145 (1959). When sample-polls are held non-hearsay, the propriety of the polling techniques employed must, of course, still be adequately demonstrated to justify their admission. *Zippo Mfg. Co. v. Rogers Imports, supra* note 217. For useful treatments of the uses of various types of opinion polls in this type of litigation, see Bonynge, Trademark Surveys and Techniques and Their Use in Litigation, 48 A.B.A.J. 329 (1962); Blum, The Art of Opinion Research; A Lawyer's Appraisal of An Emerging Service, 24 U. CHI. L. REV. 1 (1959); Zeisel, The Uniqueness of Survey Evidence, 45 Cornell L.Q. 322 (1960). See also Annot., 76 A.L.R. 2d 919.

[225] See, e.g., *State Wholesale Grocers v. The Great Atlantic & Pacific Tea Co.*, 154 F. Supp. 471, 498-499 (N.D. Ill. 1957) reversed in part, 258 F.2d 831 (7th Cir. 1958), cert. denied, 358 U.S. 947, 79 S.Ct. 353, 3 L.Ed.2d 352 (1959), where both a shopping survey (poll) and a price survey (sample) were received in evidence in a private action under the antitrust laws.

admissible only if they fall within an exception to the hearsay rule. It is not recommended that there be created a general exception to the hearsay rule. It is not recommended that there be created a general exception to this rule which would allow the admission of all polls into evidence. However, in a given case the factors of necessity and the circumstantial guarantee of trustworthiness may be such that a particular opinion survey could properly be admitted to prove the truth of the facts reported within recognized principles of evidence. This much is now provided by Rule 703 of the new Federal Rules of Evidence.

Proof of necessity does not require a showing of total inaccessibility to proof of the facts desired to be shown, but the offeror must show the impracticability of making his proof by conventional methods.[226]

In evaluating the trustworthiness of a particular opinion survey, attention should be centered on the nature of the fact or facts to be proved thereby, and the manner of conducting the survey. If a poll records the interviewees' observations or knowledge of objective facts such as color, number, size, and the like, it may, if properly conducted, possess the elements of trustworthiness sufficient to be admitted.[227] If, on the other hand, a poll records subjective data such as the beliefs, opinions or motivations of the interviewees, its trustworthiness may well be less, the showing of necessity in such case should be stronger, and the question of trustworthiness should be more closely scrutinized.[228]

The offeror has the burden of establishing that a proffered poll

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[226] See *United States v. E.I. duPont DeNemours and Company*, [1959 TRADE CASES ¶ 69,461], 177 F. Supp. 1, 18-19 (N.D. Ill. 1959), modified [1961 TRADE CASES ¶ 70,017], 366 U.S. 316, 81 S.Ct. 1243, 6 L.Ed. 2d 318 (1961), *Eighth Avenue Coach Corp. v. City of New York*, 170 Misc. 243, 250-251, 10 N.Y.S.2d 170 (S.Ct. 1939), affirmed, 286 N.Y. 84, 35 N.E.2d 907 (1941); *United States v. Aluminum Co. of America*, 35 F. Supp. 820, 823 (S.D.N.Y. 1940); *Westinghouse Radio Stations, Inc., 10 Pike & Fischer, Radio Regulation 878* (Docket No. 9138, F.C.C., June 29, 1955) (the survey was "the most probative evidence practicable under an issue which, as to *Westinghouse*, permitted of no absolute proof . . .").

[227] Results of reliable polls and samples are now admissible under the Federal Rules of Evidence, however, regardless of whether they can be characterized as hearsay. See note 213, *supra*.

[228] The testimony of the statistical expert has only limited bearing on the issue of the trustworthiness of the poll. In the case of a sample poll, he can and must establish that the answers of the interviewees can be projected on statistical principles, within a predictable and inconsequential margin of error, to those which would have been given by the entire universe had they been similarly interviewed. But this does not go to the question of whether the interviewees have given—or that the universe would give—factually correct answers.

was conducted in accordance with accepted principles of survey research, i.e., that the proper universe was examined, that a representative sample was drawn from that universe, and that the mode of questioning the interviewees was correct. He should be required to show that: the persons conducting the survey were recognized experts; the data gathered was accurately reported, and the sample design, the questionnaire and the interviewing were in accordance with generally accepted standards of objective procedure and statistics in the field of such surveys. Normally this showing will be made through the testimony of the persons responsible for the various parts of the survey.[229]

Once the offered poll has passed the test of admissibility, the objections to the manner in which it was conducted go to the weight of the poll as evidence.[230]

**2.713 Third Recommendation:** The underlying data, method of interpretation employed and conclusions reached in polls and samples should be made available to the opposing party far in advance of trial.

It is desirable to consider a proposed poll at pretrial so that the flaws in the mechanics may be eliminated, to the extent possible, before the poll is taken.[231]

In any event, it is desirable that questions going to the admissibility of the polls or samples be raised and, if possible, decided prior to the time they are offered in evidence. However, no procedure should be adopted which in effect would place the burden of disproving admissibility on the opposing party. Although making all

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[229] The survey may, of course, be tested by cross-examination of the offeror's witness prior to its receipt in evidence. Possible shortcomings in the survey method are discussed in Blum and Kalven, The Art of Opinion Research: A Lawyer's Appraisal of An Emerging Science, 24 U. Chi. L. Rev. 1, 7-15 (1956); see also, Sorensen and Sorensen, Responding to Objections Against the Use of Opinion Survey Findings in the Courts, 20 J. of Marketing 133 (1955); Sorensen and Sorensen, The Admissibility and Use of Opinion Research Evidence, 28 N.Y.U.L. REV. 1213 (1953). Proponents of the use of survey data in the courts point out that the substantial guarantee of trustworthiness required for an exception to the hearsay rule is to be found in properly conducted surveys since survey methodology, developed over the years, seeks to avoid the same hazards as does the hearsay rule, and non-sampling errors can be detected and evaluated by competent research technicians. See Barksdale, *supra*, note 214. See also, Zeisel, The Uniqueness of Survey Evidence, 45 Cornell L.Q. 322 (1960).

[230] In *United States v. National Homes Corp.*, 196 Supp. 370 (N.D. Ind. 1961), the court overruled defendant's objection to admissibility of a survey on the ground that the proffered survey did not examine a proper universe, and held that this contention related to the probative value of the evidence rather than to its admissibility.

[231] See Note, Public Opinion Surveys as Evidence, The Pollsters Go To Court, 66 Harv. L. Rev. 498, 508 (1953). See also commentaries cited in note 224, *supra*.

the data regarding a poll or sample available to the opposing party may alleviate many of the problems, merely making available to the opposing party the documents underlying the poll and the names and addresses of the samplers and interviewees (so that they can be interviewed, cross-examined or the trustworthiness of their answers otherwise checked) should not be held to place upon the opposing party the burden of proving the proffered poll or sample untrustworthy.

**2.714 Fourth Recommendation:** When computer maintained records and computer analyses of raw data are valuable sources of evidence, their use and admissibility should be promoted and facilitated.

The legal profession in recent years has been confronted with the continuing problem of accommodating the rules of evidence to technological changes in our society. The difficulties in determining the admissiblity of such evidence as x-rays, radar speed tests and lie detector tests are dwarfed by the new problems which have been created by the advent and increased use of electronic data processing and storage machinery. In the short period since its introduction following the Second World War, the computer has become a pervasive feature of everyday business. The operations of modern manufacturing and service corporations, banks, insurance companies, and credit institutions are dependent on computers to the extent that it is now impossible to imagine such business functioning without these electronic aids.

The rapid rate of technological development and the expanding range of applications of computers suggest that the problems are still in their infancy and that the importance of computer based evidence can only increase with the passage of time Dr. Jerome B. Wiesner, President of the Massachusetts Institute of Technology, has said:

> The computer, with its promise of a millionfold increase in man's capacity to handle information, will undoubtedly have the most far-reaching social consequences of any contemporary technical development. The potential for good in the computer, and the danger inherent in its misuse, exceed our ability to imagine . . . . We have actually entered a new era of evolutionary history, one in which rapid change is a dominant consequence. Our only hope is to understand the forces at work and to take advantage of the knowledge we find to guide the evolutionary process.[232]

The rules of evidence which were evolved in less technologically ad-

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[232] Quoted in The New Computerized Age, a special issue of the Saturday Review, July 23, 1966, at 15-16.

vanced times must be adapted to meet the evidentiary problems and commercial realities posed by these developments.[233] For discussion of the admissibility of computer printouts, see Part I, § 2.716, *infra*, and Rules 803(6) and 1001(3), Federal Rules of Evidence.

**2.715 Fifth Recommendation:** Discovery requests relating to the computer, its programs, inputs and outputs should be processed under methods consistent with the approach taken to discovery of other types of information.

Machine records are discoverable under Rules 34 and 45 of the Federal Rules of Civil Procedure. Rule 34(a), as amended in 1970, authorizes orders for the production by the parties of "any designated documents, photographs, phono-records, and other data compilations from which information can be obtained, translated, if necessary, by the detection devices into reasonably usable form"[234] while Rule 45(b) is directed to obtaining the production of "books, papers, documents or tangible things" from nonparties. In the computer context, the basic types of machine records commonly utilized include: (1) punched cards; (2) paper and magnetic tapes; and (3) a variety of other machine oriented components which record and store data. In the absence of special considerations such as privilege, work product immunity, or the presence of industrial or trade secrets in the machine, readable computerized data (including computerized analyses) in any of the above-mentioned forms should be freely discoverable. If the discovering party has data processing equipment that is compatible with that of the owner of the computer records, delivery of the machine-readable version of the information, or a copy thereof, will often be sufficient. When the discovering party's equipment is not compatible, or he has no computer equipment, delivery of a print-out of the machine-readable records may provide a reasonable alternative mode of discovery.

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[233] Chief Judge John R. Brown of the United States Court of Appeals for the Fifth Circuit has expressed the view that courts must accommodate the rules of evidence to the computer age or face antiquation. "For a machine now capable of making 240,000 additions per second, reading magnetic tape containing 4 1/2 million digits of information on a single reel at a breath-taking speed, to speak of the shop book rule is, indeed, an anachronism. But we operate more comfortably with familiar concepts. Just as that rule dispensed with the necessity of producing the person who made the entry, the law must find a means of giving judicial currency to that which is reliable and acceptable in the market place. The Federal Business Records Act and the Uniform Business Records as Evidence Act certainly have sufficient intrinsic flexibility to permit their adaptation to this new form and type of business records." Brown, Electronic Brains and the Legal Mind: Computing the Data Computer's Collision with Law, 71 Yale Law Journal 239, 248 (1961).

[234] See generally, 8 Wright & Miller, Federal Practice and Procedure § 2218.

The court, in its discretion, may prescribe that discovery take place in any one of a number of other ways. For example, it may be that the information has not been recorded in the computer in a form in which it will be of maximum utility to the examining party. Accordingly, it may be appropriate for the court to facilitate, or even encourage, the examining party to develop his own programs for the analysis or reorganization of the machine-readable data so as to convert the information into a form that is more germane to the examiner's defense or prosecution of the action. "As computerization techniques become even more complex, the ability to use machine-readable information to the fullest may require data analysis and relational study, which may have to be carried out on the system owned by the party whose computerized information is being inspected."[235]

However, the court must exercise care in permitting one party to analyze the business data of another party, although as a practical matter the same risks present in discovering computer records are presented by the discovery of more traditional forms of records. While the court must be sensitive to problems of trade secrets, privileged information, and trial preparation material and must keep in mind that in modern business the methodology of a company's computer system may be a valuable asset that should not be handed over to a litigation opponent without good reason for doing so, the protective provisions of Rule 26(c) provide the court with ample power to prevent abuse and reallocate costs when necessary. Court-appointed experts may also be of some aid to the court in the discovery of facts relevant to computerized information. For a discussion of the court-appointed expert, see Part I, § 3.40, *infra*.

If print-outs of the information contained on the computer records do not exist, the question is presented whether a party may be required to prepare and produce such print-outs. The decisions are unclear on when a party will be required to process information into the form requested by his opponent.[236] It has been suggested, however, that such processing should be required where programs

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[235] 8 Wright & Miller, Federal Practice and Procedure § 2218.

[236] In *United States v. United States Alkali Export Ass'n, Inc.*, 7 F.R.D. 256 (S.D.N.Y. 1946), the court refused to require the preparation of certain requested lists revealing the location of defendant's operating facilities. On the other hand, in *Van Wagner v. National Container Corp.*, 16 F.R. Serv. 34.13, Case 3 (S.D.N.Y. 1952), the defendant was directed to prepare a list of its customers, and in *Adams v. Dan River Mills*, 54 F.R.D. 220 (W.D. Va. 1972), the defendant was required to produce a print-out from a payroll file.

exist to print out the records in the form desired,[237] or when it would require a minimum of effort to prepare a program to secure the requested information.[238] Rule 31(a) itself and the accompanying Advisory Committee Note make it clear that there are many situations in which the court should order the preparation and delivery of a print-out.

In many instances it will be essential for the discovering party to know the underlying theory and the procedures employed in preparing and storing the machine-readable records. When this is true, litigants should be allowed to discover any material relating to the record holder's computer hardware, the programming techniques employed in connection with the relevant data, the principles governing the structure of the stored data, and the operation of the data processing system. When statistical analyses have been developed from more traditional records with the assistance of computer techniques, the underlying data used to compose the statistical computer input, the methods used to select, categorize, and evaluate the data for analysis, and all of the computer outputs normally are proper subjects for discovery.

Unless discovery would violate Rule 26(b)(3) or 26(b)(4), litigants ordinarily should also be allowed to discover written materials relating to the programming and operation of the opponent's data processing system. When, in anticipation of litigation, statistical analyses have been prepared by computers, the data (inputs), the methods used to prepare the analyses, and all results (outputs) are proper subjects for discovery.

> **2.716 Sixth Recommendation:** Computer maintained records kept in the regular course of business should be admitted when it has been shown that the criteria required for the admission of non-computer maintained business records have been met, the court finds that reliable computer equipment and techniques have been used, and the material is of probative value.

Prior to the introduction of data processing machines, business data were recorded in books of account and voluminous filing systems which required extensive time, space and labor to maintain. With the development of economical, efficient computers it has become common to maintain such data on punched or magnetic cards and tapes, discs, drums, cores, and similar media, and on printed

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[237] See Freed, Evidence and Problems of Proof in a Computerized Society, Modern Uses of Logic in Law, (December 1963) 171, 180.

[238] See Freed, Computer Print-outs as Evidence, in 16 Proof of Facts, 273, 324-329.

materials (print-outs) reflecting the information recorded. Moreover, computer procedures often require that the data be recorded in a machine-readable format or language which is not intelligible to the eye in the manner of more traditional forms of business records. Admissibility of such material may depend on the determination of whether the computer records or print-outs are kept in the regular course of business.

The leading cases on this question are *Transport Indemnity Company v. Seib*,[239] and *King v. State ex rel. Murdock Acceptance Corporation*.[240] In *Transport* a witness for the insurance company testified that information pertinent to its policies was regularly fed into a computer, which recorded this data on tapes and calculated the premiums due. After the presentation of this and other extensive testimony regarding the procedures involved, the trial court received in evidence a computer print-out of the earned premiums sued upon by plaintiff. In holding that the computer print-out was admissible under the Nebraska business records statute, the Nebraska Supreme Court said:

> No particular mode or form of record is required. The statute was intended to bring the realities of business and professional practice into the courtroom and the statute should not be interpreted narrowly to destroy its obvious usefulness. . . .
>
> The machine here performs the bookkeeping task in the usual course of business. Instead of on paper, the information and calculations are stored on tape and may be retrieved and printed at any time. The taped record furnished a cumulative record based on information flowing into the office of the plaintiff company day by day and fed into the machine in response to a systematic procedure for processing each insured's account.

In *King*, the Mississippi court said:

> In sum, we hold that print-out sheets of business records stored on electronic computing equipment are admissible in evidence if relevant and material, without the necessity of identifying, locating, and producing as witnesses the individuals who made the entries in the regular course of business if it is shown (1) that the electronic computing equipment is recognized as standard equipment, (2) the entries are made in the regular course of business at or reasonably near the time of the happening of the event recorded, and (3) the foundation testimony satisfies the court that the sources of information, method and time of preparation were such as to indicate its trustworthiness and justify its admission.

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[239] 178 Neb. 253, 259, 132 N.W.2d 871, 875 (1965) (action by insurer to recover earned premiums).

[240] 222 So.2d 393, 398 (Miss. 1969).

As these two extracts indicate, admission has been allowed when the court is satisfied with the foundation laid by the party seeking to introduce a computer print-out.[241] However, there are cases in which a court has found the foundation to be insufficient,[242] and other decisions in which the foundation has been sufficient.[243]

The cases have not formulated precise guidelines for testing the adequacy of a foundation for computer print-outs. A two-tiered test appears to be involved. First, all of the requirements of the Business Records exception to the hearsay rule must be satisfied. The record must be made in the regular course of business, at or near the time of the act or occurrence in question, and by a person with knowledge of the act. Second, the computer procedures used must insure the trustworthiness, accuracy, and completeness of the records and it must be shown that the system employed protects against human errors and mechanical breakdowns.

Before the Federal Rules of Evidence went into effect, the controlling statute was 28 U.S.C. § 1732, which is similar to the Nebraska statute involved in Transport Indemnity, Section 1732 pertinently provides that:

> any writing or record, whether in the form of an entry in a book or otherwise . . . shall be admissible as evidence of such act, transaction, occurrence, or event, if made in regular course of any business.

To qualify for admission within the meaning of § 1732, a record must have been made pursuant to established procedures for systematic and timely recordation and preservation. The rationale of § 1732 was expressed in *Louisville & Nashville R.R. Co. v. Knox Homes Corp.*[244] as follows:

> The probative reliability of these papers as proof of the matters reflected therein was established by the system under which they are made. It is the business record in the form regularly kept by the particular business and reliance thereon that gives the trustworthiness and hence legal admissibility to such records.

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[241] *Sunset Motor Lines, Inc. v. Lu-Tex Packing Co., Inc.*, 256 F.2d 495 (5th Cir. 1958) is not a barrier to the admission of computer records since the court did not reach the question of whether the record would have been admissible after a proper foundation had been laid.

[242] *State v. Springer*, 197 S.E.2d 530 (N.C. 1973); *People v. Gauer*, 288 N.E.2d 24 (Ill. App. 1972); *Railroad Comm'n v. So. Pacific Co.*, 468 S.W.2d 125 (Tex. Civ. App. 1971); *Arnold D. Kamen & Co. v. Young*, 466 S.W.2d 381 (Tex. Civ. App. 1971).

[243] *United States v. Russo*, 480 F.2d 1228 (6th Cir. 1973); *Seattle v. Heath*, 520 P.2d 1392 (Wash. 1974); *Wheeler v. Cain*, 459 S.W.2d 618 (Tenn. 1970); *Merrick v. United States Rubber Co.*, 440 P.2d 314 (Ariz. 1968); *State v. Veres*, 436 P.2d 629 (Ariz. 1969).

[244] 343 F.2d 887 (5th Cir. 1965) (a railroad's suit against a shipper for alleged undercharges).

In *Olympic Insurance Co. v. H.D. Harrison, Inc.*,[245] the court referred generally to the federal statutes and concluded that "printouts . . . produced in the ordinary course of business . . . at least have a prima facie aura of reliability."

In *Missouri Pacific Railroad Company v. Austin*,[246] the court suggested that § 1732 be liberally interpreted as follows:

> So long as regard is paid to the indispensible fundamental trustworthiness of the proffered [business] records, the statute [Title 28, U.S.C., § 1732] '. . . should of course be liberally interpreted so as to do away with the anachronistic rules which gave rise to its need and at which it was aimed.'

In the Annotation entitled "Proof of Business Records Kept or Stored on Electronic Computing Equipment," 11 A.L.R.3d 1377, 1378, it is noted that:

> [T]he legal problems in connection with [the use of computer print-outs] will resolve themselves into the question whether the proof offered by the litigant seeking receipt of such records in evidence, as to the manner in which they were prepared and kept, is sufficient to satisfy the pre-electronics requirements as to the admission of business records prepared and kept in conventional [forms] . . . that is to say, has it been sufficiently shown that the records kept or stored electronically were made in the regular course of business, that they were based on information within the personal knowledge of one whose duties included the collection of such information, that the records themselves were prepared by those who understood the operation of the equipment and whose regular duty it was to operate it[?]. . . .

In keeping with this approach, the court in *United States v. De Georgia*,[247] a criminal case, said that "it is immaterial that the business record is maintained in a computer rather than in company books" as long as:

> (1) [T]he opposing party is given the same opportunity to inquire into the accuracy of the computer and the input procedures used, as he would have to inquire into the accuracy of written business records, and (2) the trial court, as in the case of challenged business records, requires the party offering the computer information to provide a foundation therefor sufficient to warrant a finding that such information is trustworthy.

This liberal policy on admissibility is in accord with the position of the federal courts on records produced by other mechanical means. For example, an electrocardiogram tape,[248] a tachograph

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[245] 418 F.2d 669, 670 (5th Cir. 1969).

[246] 292 F.2d 415, 422 (5th Cir. 1961).

[247] 420 F.2d 889, 893 n.11 (9th Cir. 1970).

[248] *Croll v. John Hancock Mut. Life Insurance Co.*, 198 F.2d 562 (3d Cir. 1952).

chart[249] and the tape recording of an inflight conversation between an airplane pilot and the airport[250] have all been held to be admissible business records.

This policy toward the admissibility of computer records seems appropriate. The usefulness of the computer maintained records for evidence purposes is not diminished because they are not visually intelligible or because they are embodied in media like punch cards, magnetic tapes or discs. If the cards, magnetic tapes, discs, and computer component parts are used to keep ordinary business records, the same assurances of trustworthiness normally should be present in these records as are present in visually discernable records.[251] The language of § 1732 indicates it is the nature of the record, not the form of recordation, which is the significant criteria.

The Federal Rules of Evidence treat computer data on the same basis as other business records. See Rule 803(6). However, the rule allows the court to consider the special characteristics of computer records in determining whether to admit them. Since a computer file can be altered without leaving any apparent trace, the court should satisfy itself that the records presented are trustworthy. One way is to require that the records to be introduced be relied upon in the everyday operations of its maker.[252] The underlying rationale of the Business Records exception to the hearsay rule is that information a business relies on is likely to be trustworthy.

Another factor to be considered is the source of the records. A disinterested non-party's records are less likely to be altered for trial than those of a party. Federal Rule of Evidence 803(6) does not draw a distinction between records of parties and non-parties but it is flexible enough to allow a court to find a party's computerized data to be untrustworthy as self-serving in an appropriate case.[253]

The Federal Rules of Evidence also eliminate two other possible objections to the introduction of computer evidence. Rule 1001(1) defines "writings" to include "magnetic impulse, mechanical or electronic recording, or other form of data compilation," thereby

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[249] *NLRB v. Pacific Intermountain Express Company*, 228 F.2d 170 (8th Cir. 1955), cert. denied 351 U.S. 952, 76 S.Ct. 850, 100 L.Ed. 1476 (1956).

[250] *LeRoy v. Sabena Belgian World Airlines*, 344 F.2d 266 (2d Cir. 1965), cert. denied, 382 U.S. 878, 86 S.Ct. 161, 156 L.Ed.2d 119 (1965).

[251] The importance of testing the trustworthiness of the computerized records has been emphasized by the commentators. See, e.g., Comment, Admissibility of Computer Kept Business Records, 55 Cornell L. Rev. 1033 (1970); Comment, Evidence—Admissibility of Computer Business Records as an Exception to the Hearsay Rule, 48 N. Car. L. Rev. 687 (1970).

[252] See 5 Wigmore, Evidence § 1522.

[253] See Advisory Committee's Note to Rule 803(6).

preventing any argument that computer printouts are not writings for purposes the Business Records exception to the hearsay rule. Rule 1001(3) makes it clear that a computer printout of an existing file is an "original" for purposes of the best evidence rule.

Another problem is whether a computer printout that is compiled for trial is objectionable on that basis alone. In *Transport*[254] the Supreme Court of Nebraska held that printouts of records regularly kept in the course of business which have been produced solely for the purpose of the litigation may be admissible:

> Defendant argues exhibit 14 is inadmissible because it was prepared for use in this litigation and trial. . . .
>
> This argument exalts the form over the substance. The retrieval from the taped record . . . was made for the purpose of the trial. But, the taped record and the information and calculations thereon were made in the usual course of business and for the purpose of the business alone. There is no merit to this contention.

In *United States v. Russo*,[255] the United States Court of Appeals for the Sixth Circuit, in a mail fraud case, allowed into evidence a computer summary showing that a criminal defendant had claimed reimbursement from Blue Shield for a disproportionate number of certain medical procedures. The court said it was immaterial that the summary was "prepared for trial" since it was merely a copy of data in the company's existing computer file.

Even though a computer printout that did not exist before the litigation was commenced may not be objected to solely on the basis that it is prepared for trial, it is important for the court to insure that the proffered evidence is indeed a version of information that existed previously and that it is an accurate representation of that information. For example, the proponent must demonstrate that the program that generated the print-out has been thoroughly checked. Even though normal business programs go through much "debugging" prior to their use, errors crop up from time to time and must be corrected as they are discovered. This process may take several years. A program developed to generate a particular printout for litigation purposes will not have gone through the same process and the court should assure itself of its reliability.

There are additional special problems that computer based record keeping presents that bear on the weight to be accorded computer based data and, in some contexts, might even control its admissibility. As time progresses, machine record systems will bear

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254 178 Neb. 253, 260, 132 N.W.2d 871, 875 (1965); see also, Freed, *supra* note 238, at 316-320.

255 480 F.2d 1228 (6th Cir. 1973).

less and less resemblance to traditional means of business record keeping. Even today, electronic data processing and storage systems used by banks, corporations, and credit agencies are not simply electronic versions of double entry bookkeeping or accounts. The increased speed of computer input, electronic manipulation and the economies of data storage create qualitative differences between computer and traditional record keeping in many contexts. For example, computer record keeping often does not require an entry for each individual transaction in a chain of transactions. The computer may simply maintain the current balance of an account and eliminate any trace of the intermediate transactions that led to the account's having the particular balance it does at a given moment in time. As a result, the computer's report as to the status of the account may be less informative than the traditional "T" account, which contains an entry of all of the transactions relevant to that account.

On the other hand, it must be kept in mind that the increased efficiency and economies of computer record keeping may motivate business enterprises to gather a wider range of information than they have in the past. Once the cost of data input and storage declines sufficiently, it is probable that corporations will maintain a higher level of information about their employees' and customers' activities than they formerly did. Although these records may be "made in the regular course" of business, much of their content may be "softer" (i.e., less precise and comprehensive) than what is found in more typical records. Further, there is some concern whether the care that goes into the collection and recordation of new types of data or its significance from a reliability or evidentiary perspective will be as great as the more limited records traditionally kept by business enterprises.[256]

Sometimes, data are randomly recorded in the computer in the sequence in which events occur or information is received rather than as organized bundles relating to specific customers or transactions. When directed to do so, the machine will collect and print out all the data relating to a particular transaction or customer. Such a printout is not a visual counterpart of the machine record but a compilation of scattered, related information. As indicated in connection with the discussion of computer printouts compiled for trial, this evidence should not be rejected merely because it is not a visual counterpart of the machine record,[257] but the court must care-

[256] See generally A. Miller, The Assault on Privacy: Computers, Data Banks, and Dossiers (1971).

[257] See Freed, *supra* note 237, at 173-174.

fully consider whether its reliability has been compromised in any way.

These and numerous other problems of computer evidence yet to be perceived mean that courts will have to exercise care that in attempting to permit use by litigants of the benefits of the new technology, they do not abdicate their responsibility to distinguish among various types of computer records, their composition, and the manner in which they were created and have been maintained. In order to exercise a discriminating judgment the court must be fully informed at an early date of the material sought to be discovered and used as evidence.

> **2.717 Seventh Recommendation:** Summaries and analyses of masses of data made by a computer should be admitted on the same basis as other summaries or analyses. Computer inputs and outputs, the underlying data and the program method employed should be made available to the opposing party in advance of trial as a condition of admissiblity.

Computers perform a useful and often necessary function in summarizing and analyzing great masses of data. Many complex analyses formerly made from visually discernible data by statisticians can now be made more efficiently and with greater sophistication by a properly programmed computer. The admissibility of a statistician's analysis is based on the reliability of the supporting data and the analytical process utilized.[258] Use of a computer to facilitate preparation of the study should not detract from its admissibility.[259] If anything, the computer's superior ability to handle large quantities of data and do mathematical computations will enhance the probative value of the evidence in many contexts.

Nonetheless, it must always be remembered that although a computer can do mathematical calculations and manipulate bits of information faster and with fewer mechanical mistakes than humans, the machine basically can do only what humans instruct it to do and can operate only on data supplied by humans. Thus, in weighing the value of machine analyses, it is essential to evaluate the competence and techniques of the people who have designed the operational methods of the computer and the accuracy and completeness of the data which the computer is directed to manipulate.

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[258] Sampling methods have frequently been suggested as a tool for shortening protracted cases. See, for example, *United States v. Columbia Pictures Corporation*, 25 F.R.D. 497 (S.D.N.Y. 1960), and *United States v. National Homes Corp.*, 196 F. Supp. 370 (N.D. Ind. 1961).

[259] Care should be taken to assure that the basic data used were valid and a proper method of compilation was employed. See Freed, *supra* note 238, at 339-350.

Moreover, there often is a wide difference in the character and reliability of computer summaries and analyses of different types of data. Data relating to a computer based payroll or employment records are inherently "harder" (more objective) and will produce a more objective analysis or summary than will the information fed into a computer to help develop the legislative reapportionment of a political unit, which is "soft" (less objective) and is bound to yield a more subjective product.

A machine tabulated survey of 4,600 questionnaire answers was admitted by stipulation in *State Wholesale Grocers v. Great Atlantic & Pacific Tea Company.*[260] Computer runs of the prices for all transactions in an industry, summarized in the form of an industry price index, have also been admitted by stipulation in the electrical equipment antitrust trials.[261] It is essential that the underlying data used in the analyses, programs and programming method and all relevant computer inputs and outputs be made available to the opposing party far in advance of trial. This procedure is required in the interest of fairness and should facilitate the introduction of admissible computer evidence. This procedure provides the adverse party and the court with an opportunity to test and examine the underlying data on which the machine analysis is based, the program and all outputs prior to trial. The pretrial rulings on objections can then be made by the court. Without agreement among the litigants, introduction of the computer outputs should be feasible if the party or parties who supervised the data processing testify to the validity of the methods used, the reliability of the computer, the accuracy of the inputs, the validity of the programming and the accuracy and completeness of the outputs.

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[260] 154 F. Supp. 471, 497 (N.D. Ill. 1957), reversed in part, 258 F.2d 831 (7th Cir. 1958).

[261] See, e.g., trial transcript of *Philadelphia Electric Company v. Westinghouse Electric Corporation* (E.D. Pa. 1964), pp. 2377-2380.