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The Appraisal of Electronic Records: What is New?

In contemporary times, the technology of computers and communication have been combined to make instantaneous access to information a routine matter in the conduct of affairs in every sector of society. People value the latest, supposedly best information, and continually obtain the latest technology to acquire and manage it. Some of this information is closely connected with the actions taken during the conduct of affairs, but a great deal of it is simply part of the social ambience. In such circumstances, it is often difficult to distinguish records or archival documents, the two terms meaning the same, from other stores of data and information. It also difficult to manage records so that they remain uncorrupted in an environment that puts a premium on the capability to communicate and manipulate information to increase productivity. Such an environment contrives in innumerable ways to defeat the archival goal of long-term preservation of authentic records.

As MacNeil (2000a) puts it, "the authenticity of a record is assessed in relation to its identity (i.e., was it written by the person who purports to have written it?) and its integrity (i.e., has it been altered in any way since it was created and, if so, has such alteration changed its essential character?)." In the traditional environment of stable physical media like paper, assessments of authenticity have relied on the enduring existence of physical objects. In the electronic environment, we lose the obvious assurance of authenticity that can be gleaned from examining the physical aspects of the record. In the digital world, as Ken Thibodeau (2000) remarks, "strictly speaking, it is not possible to preserve an electronic record. It is only possible to preserve the ability to reproduce an electronic record. It is always necessary to retrieve from storage the binary digits that make up the record and process them through some software for delivery or presentation." In every twist and turn of the technology, even in its ordinary operation, exact replication in every case is not guaranteed. In such circumstances, what needs to be done if we are to give electronic records a measure of trust such that they will serve us in the ways traditional records have?

The InterPARES Project

To address these vexing difficulties, the InterPARES project set itself the goal of developing the theoretical and methodological knowledge essential to the permanent preservation of electronically generated records, and on the basis of this knowledge to formulate model strategies, policies, and standards capable of ensuring their preservation. InterPARES is an acronym standing for International Research on Permanent Authentic Records in Electronic Systems. The project, an international, interdisciplinary, collaborative research initiative, began work in January 1999, and is scheduled to complete its first phase at the end of 2001. Further information on the background, organization, researchers, objectives, and methodology of the project is available at <www.interpares.org>. The project's researchers are divided into three task forces investigating the conceptual requirements for preserving authentic electronic records (the Authenticity Task Force), appraisal criteria and methods for authentic electronic records (the Appraisal Task Force), and methods for preserving authentic electronic records (the Preservation Task Force.) In the latter stages of the project, the results of the work of the three task forces will be integrated in the work of the fourth task

force, called the Strategies Task Force. It is important to note that the work on appraisal is dependent on the Template for Analysis developed by the Authenticity Task Force (see<www.interpares.org/documents/TemplateforAnalysis_071100.pdf>), and on its work to specify the conceptual requirements for authenticity of electronic records. Readers may also refer to the glossary of archival and diplomatic terminology available on the project's website (http//:www.interpares.org/documents/Glossary). This article reports the preliminary findings of the Appraisal Task Force.

Aims of the Appraisal Task Force

The goal of the Appraisal Task Force is to determine whether the evaluation of electronic records for permanent preservation should be based on theoretical criteria different from those for traditional records and how digital technologies affect the methodology of appraisal. Before the Task Force started work, a number of research questions in its domain were set out. They were:

- What is the influence of digital technology on appraisal?
- What is the influence on appraisal of retrievability, intelligibility, functionality, and research needs?
- What are the influences of the medium and the physical form of the record on appraisal?
- When in the course of their existence should electronic records be appraised?
- Should electronic records be appraised more than once in the course of their existence, and, if so, when?
- Who should be responsible for appraising electronic records?
- What are the appraisal criteria and methods for authentic electronic records?

The author of this paper is Chair of the Task Force. The other members are Barbara Craig of the Faculty of Information Studies at the University of Toronto, Phil Eppard, of the Faculty of Information at The University at Albany of the State University of New York, Gigliola Fioravanti of the Italian Central Direction of Archives, Norman Fortier of the National Archives of Canada, Mark Giguere of the National Archives and Records Administration of the United States, Ken Hannigan of the National Archives of Ireland, Peter Horsman and Agnes Jonker of the School of Archival Science and Research in the University of Amsterdam, and Du Mei from the central archives administration in China.

Background of the Question of Appraisal of Electronic Records

We began our work by reviewing the literature in English on appraisal of electronic records (Eastwood et al, 2000). Archivists have been concerned with the challenge of appraising electronic records for over twenty years, through several phases in the evolution of technology, from the period dominated by mainframe computers, to the introduction and spread of isolated desktop personal computers, to the present with its organizational intranets and the Internet. Much of the literature dwells on the difficulties of defining what a record is in the electronic environment and of identifying and extracting records of long-term value (or data or information for that matter) from live systems. In addition, celebrated court cases like Armstrong v. Executive Office of the President and Public Citizen v. John Carlin in the United States implicitly raised questions about the trustworthiness of records maintained in systems subject to few procedural controls. MacNeil (2000b, 77-85) summarizes the significance of these cases.

Rather than discussing appraisal as such, many writers in the 1980s and 1990s fell to exhorting organizations to make provision for effective electronic records keeping, including procedures for disposition, in the processes of systems design and implementation. For example, an American archivist (Kowlowitz, 1991) maintained that "the most pressing issues facing electronic records appraisal today are not narrowly technical and methodological but broad program development and information management issues." Most writers of the time believed that archivists had to be involved in the design of systems to build into them procedures for the appraisal and disposition of records. A Canadian archivist (Bailey, 1989-90) asserted that archivists cannot wait until inactive electronic records are offered to them for appraisal, as they might have for paper records; too many computer records have vanished by then, and the documentation necessary for their proper appraisal has been lost, destroyed, or is hopelessly outdated. The sheer volatility of electronic records should be a powerful inducement for archivists to accept increased involvement in the scheduling process, beginning at the systems design stage. Again, however, this is not an issue of new or revised theory or principle, but merely one of timing and strategy.

Australian (Acland, 1991 and O'Shea, 1991), Dutch (Hofman, 1994 and Horsman, 1997), and American (Dollar, 1992) writers, as well as a publication by the International Council on Archives (1997) take a similar stance. These difficulties explain in part why so few archival services have actually appraised and taken electronic records into custody. In the circumstances, it is not surprising that few writers discuss the difficulty of preserving authentic electronic records, and how those difficulties can in part be addressed during the process of appraisal. The aim of our work, then, is to demonstrate how during appraisal actions can be taken to initiate the process of preservation of authentic electronic records.

Modeling the Selection Function

To further its work, the Task Force decided to engage in the exercise of developing a function model of the various activities undertaken during appraisal as a way of isolating the various theoretical and methodological questions that arise. A function model represents the various activities of a functional process in a series of structured diagrams. The diagrams and associated definitions are accessible at <http://www.interpares.org/draft_reports.htm >. Rather than review the diagrams, I shall summarize the conclusions to which our modeling exercise is leading us.

We began with two important assumptions. First, we assumed that the function at issue is selection of electronic records. Second, we viewed selection from the perspective of the entity responsible for long-term preservation of records of an organization, which for simplicity's sake we call the preserver. That entity may be an archival institution like the archives of a national, provincial or municipal government, or it may be an archival program of an organization such as a church, a university, or a corporate body like a business firm. The assumption is that the same activities occur in any organizational context where selection is performed. Although we did not examine directly the question of appraisal of electronic records created by natural persons or organizations wishing to assign custody of their electronic records to an external archival institution or program, it is quite clear to us that many of the same activities will have to take place, whatever differences between the two situations there may be.

The Scope of Activities Involved in Selection

We see the archival function at issue as being broader than appraisal. Selecting electronic records involves appraising them and carrying out their disposition. Carrying out disposition acts as a bridge between the activities of appraisal and those of preservation. Information about electronic records amassed during their appraisal is vital to the actions taken to determine and carry out their disposition and then, later on, to the actions taken to preserve them. Nevertheless, it is important to note that, in most instances, responsibility for the actions of carrying out disposition will probably be shared between the creating body, for simplicity's sake the creator, and the preserver. There is no doubt that the organization's policies and procedures will have to sort out the responsibilities that fall to the creator and those that fall to the preserver as part of the disposition rules guiding transfer of records.

This first activity is therefore to establish, implement and maintain a framework for the selection function. Managing the selection function sets the rules and conventions of the preserver that govern appraisal and disposition. The two outcomes of managing selection are the appraisal strategy and disposition rules. Appraisal strategy is a convenient term covering such matters as criteria for appraisal, guidelines on how to apply authenticity requirements, procedures for carrying out appraisal, and procedures for reporting on appraisal activities and their results. Disposition rules cover such matters as procedures for carrying out disposition, including guidelines for writing terms and conditions of transfer, and procedures for reporting about disposition activities. The reports about appraisal and disposition activities provide information that feeds back into the management process as the framework is revised and refined in the light of experience. In general terms, managing the selection function for electronic records parallels that for traditional records.

Another activity is to monitor electronic records selected for preservation. Many of the problems that occur in the archival treatment of electronic records come from the effects of changes in their technological and other contexts that occur during their lifetime. These changes mean that the preserver must regularly monitor what is happening to electronic records destined for preservation. We see this as a distinct activity, one that ensures that up to date information about records destined for long-term preservation is compiled and appraisal decisions updated accordingly or, where there is a need, revisited. To a large extent, monitoring electronic records selected for preservation is our answer to the research questions about the timing of appraisal. In cases where appraisal is built into design of electronic systems, such as by records scheduling, or where it is conducted sometime after a system has been in operation, monitoring records selected for preservation and making adjustments as needed is part of the process of selection. By contrast, appraising electronic records long removed from the active system in which they were generated is usually made difficult because the relevant information about their technological and other contexts is often no longer available or difficult to obtain.

Three monitoring scenarios appear to be possible. In the first, relatively minor changes may lead to a relatively inconsequential revision to an appraisal and/or determination of disposition. That is, one can live with the main lines of the original appraisal and determination of disposition In the second, significant changes may require one to redo the appraisal to take account of changes in, for instance, work processes or the technological context. In the third, drastic changes, such as introduction of a completely new system, may trigger a disposition under terms of the existing appraisal and disposition, and, then, of course, a new appraisal of records in the new system when it is determined to make one. Monitoring change and determining its effects on selection decisions is nothing new. The need for it is just heightened in the electronic environment.

To sum up, the main activities of selection are (1) managing the selection function, (2) appraising electronic records, (3) monitoring electronic records selected for preservation, and (4) carrying out disposition of electronic records. I think I have said enough about managing the framework and monitoring the evolving situation of electronic records. I will now concentrate on appraising records, with a few remarks at the end about carrying out their disposition.

Selecting electronic records for long-term preservation, like selecting records in general, responds, broadly speaking, to societal needs and the creator's needs to continue to have reference to them. It also responds, explicitly or implicitly, to certain legal requirements, that is, to the concepts, principles, and specific statements in law relevant to the selection of the records in question. All the activities of selection are conducted with an understanding of the theory, methodology, and practice of archival science, including the requirements for ensuring authenticity of records. Societal needs, creator's needs, legal requirements, and archival science and authenticity requirements all condition or influence the process of selection. How they influence actions and decisions from juridical system to juridical system or for any preserver is something that the national teams of InterPARES will address in the final phase of the project in order to put the findings in context. Nevertheless, it seems obvious that managing the selection function is largely a matter of taking these conditioning factors into account when developing policies, strategies, procedures, and standards. Since our goal is to come up with a model of selection that applies in any context, we have deliberately avoided specifying the values, criteria, and the like that will be employed in favour of identifying and describing the processes involved.

It hardly needs saying that to effect selection of electronic records requires knowledgeable persons, certain facilities, and computer equipment and software. These are the necessary instrumentalities of selection. Every institution or program will need them. On this score, it is perhaps worth remarking that the need is imperative. In every sphere of activity, some records of long-term value are nowadays born digital or electronic and must remain so, for there is no possibility of creating a paper representation of the record. There is no doubt that solving the theoretical and methodological issues is a precondition to sensible expenditure on resources, but no doubt the two will have to go hand in hand. New concepts must be tested and proved effective for the overall problem to be solved.

Broadly speaking, selecting electronic records means identifying those for transfer to the preserver for continuing preservation. From among the electronic records produced by an organization some will be selected and transferred to the preserver and some will not. The outcome in any given case will either be a transfer of electronic records selected for preservation or a designation of electronic records not selected for preservation. It is a matter of organizational policy whether or not the preserver plays a role in the disposition of electronic records not selected for preservation. In any event, an outcome or result of selection is that electronic records both destined and not destined for continuing preservation are identified.

The work of the Task Force has confirmed something that is implicit in the literature on appraisal of electronic records but is not spelled out clearly. In large measure, selection of electronic records depends upon a gathering and assessment of information about the context of a given body of records or from the records themselves, and then associating relevant information compiled during the process with the records so that they can be managed effectively by the preserver and generously understood by future users. Obviously, a great deal of information about the context of electronic records exists while they are in active use, because it is needed for the continuing management of the records. This information often disappears or is difficult to assemble once records are removed from the active system in which they were generated. This is a strong argument to begin appraisal while records are still "live" in a system, and to monitor each phase of

their existence to keep appraisal decisions relevant and disposition plans practicable.

In particular, information about the technological context of electronic records comes into play at two vital stages of selection. It is needed when assessing records' authenticity, and when determining the feasibility of preserving authentic electronic records. The other (juridical-administrative, provenancial, procedural, and documentary) contextual information tends to be relevant when assessing the continuing value of records, that is, judging their capacity to serve the continuing interests of society and their creator. The juridical-administrative context is the legal and organizational system in which the creating body exists. The provenancial context is the creating body, its mandate, structure and functions. The procedural context is the business procedure in the course of which the records are generated. The documentary context is the fonds to which a record belongs, and its internal structure. Internal structure refers to the relationships among records in a fonds. For the most part, appraisers of both traditional and electronic records draw inferences about the continuing value of records from an understanding of the records and these various contexts.

The information that issues from the process of appraisal and as a result of it is of two kinds. On the one hand, there is information about the appraisal decision itself, and on the other information about the electronic records selected for preservation that will later be "packaged" with them as part of a transfer from the creator to the preserver. The latter is the necessary information about electronic records to maintain them continuously in authentic form, and includes the terms and conditions of transfer, to which the preserver may have to refer from time to time, such as when determining that a transfer contained the actual records designated to be transferred in a given case. We have defined terms and conditions of transfer as "a document that identifies, in archival and technological terms, electronic records to be transferred, together with relevant documentation to accompany them, and that identifies the medium and format of transfer, when the transfer will occur, and the parties to the transfer."

Appraising Electronic Records

Appraising electronic records breaks down into four activities in our view. The first phase compiles information from electronic records and about their contexts to generate the relevant information to be assessed in determining their value and the feasibility of preserving them in authentic form. The outcome of assessing value, or valuation information, whether communicated in a schedule, appraisal report or other instrument, and the feasibility information provide the basis for deciding the disposition of a given body of records. In fact, as we see it, there are three outcomes of the process of appraisal. There is the appraisal decision itself, that is a determination of which among a given body of records are selected for long-term preservation and which are not. There is, then, information about the appraised electronic records accumulated during the process of their evaluation, including the terms and conditions of transfer. Finally, there is a report about the appraisal decision for management purposes, containing information that feeds back into the process of managing the selection function. Although these steps in the process may not have always been explicit and their outcome carefully recorded when appraising traditional records, they were all probably implicit in the thinking of the archivist carrying out the appraisal. Effective long-term preservation of authentic electronic records will not allow us to avoid compiling the relevant information, assessing it, and reporting the results to guide disposition and facilitate future use and understanding of the records.

Assessing the value of electronic records means assessing their capacity to serve the continuing interests of their creator and society, on the one hand, and analyzing and judging the grounds for presuming the records to be authentic, on the other. With traditional records, the second step in the assessment of value is rarely explicit. For the most part, appraisers, knowing facts about the custody of the records and the degree to

which their creation and maintenance were controlled, simply assume the records to be authentic without further ado. Given the volatility of electronic records, this is a step that must be made explicit. The outcome of this second step is an assessment of authenticity, which we define as "a record or records stating the reasons for presuming electronic records to be authentic in terms of the benchmark requirements for authenticity." The Authenticity Task Force developed the benchmark requirements as part of the "Requirements for Assessing the Authenticity of Electronic Records." This document is accessible at <http://www.interpares.org/draft_reports.htm>. The statement of the "Benchmark Requirements" is reproduced in Appendix I.

In short, with electronic records, we need to establish the grounds for presuming that the records are what they purport to be, and that they have not been altered by accident on tampered with on purpose. It is our supposition that this assessment must be made as part of appraisal because years hence the information on which to make it will have disappeared or be exceedingly difficult to obtain. To sum up then, the assessment of continuing value and authenticity go together to determine the value of electronic records. The resulting valuation information, duly recorded, must be a permanent record of the preserver, which can always be associated with the records and assessed by anyone concerned to question why the decision about continuing value was made or the grounds for presuming them to be authentic. It also serves as a record that may be consulted to account for the reasoning behind the disposition decision. Once again, despite some relatively recent exhortation to the contrary, accounting of our reasoning has usually been brief or non-existent, and rarely entertained assessment of authenticity directly, which must be done for electronic records.

The Task Force has elaborated the activity of assessing authenticity. It involves compiling evidence supporting the presumption of authenticity, measuring that evidence against the benchmark requirements, and, where a need for verification arises because the grounds for presuming authenticity are very weak or non-existent, going to the extra length of verifying authenticity, for instance, by comparing them with copies preserved elsewhere, with backup tapes, or through textual analysis of the record's content or study of audit trails. The process of verification simply assembles evidence for the presumption of authenticity where it is otherwise lacking. Traditionally, we have left testing authenticity to future users. Even in cases, where we have supposed time and circumstance have affected the trustworthiness of records, we left it to users to verify authenticity. By contrast, with electronic records, we may feel obliged to do so ourselves in some cases of appraisal in order to give some measure of assurance to future users that the records are authentic by providing them with evidence very unlikely to be available to them to judge the trustworthiness of the records.

Another important aspect of the question of authenticity of electronic records is addressed when determining the feasibility of preserving them. Nothing has been more complicated to characterize conceptually than determining the feasibility of preserving authentic electronic records. Nothing like it occurs with traditional records. Essentially, we see this activity as having three stages. The first stage is to determine or identify the record elements that need to be preserved to establish the identity and integrity of the record. By elements we mean the extrinsic and intrinsic elements of form according to diplomatics. They are essentially those elements that are enumerated in the first two benchmark requirements for ensuring the authenticity of electronic records (see Appendix I). The second stage involves identifying how the record elements that need to be preserved are manifested in the electronic environment. In many cases, these elements are manifested as attributes of the record, but as we in the Appraisal Task Force look at it, this identification is not simply a matter of identifying that a particular element is manifested but rather how it is manifested as a digital component. To some extent, we find ourselves between the conceptual concern of the Authenticity Task Force with conditions and circumstances that establish the identity and demonstrate the integrity of the record and the practical concern of the Preservation Task Force to know which

digital components must be preserved so as not to impair identity and integrity. The Preservation Task Force has come up with a definition of what it means by a digital component. A digital component is "a digital object that is part of an electronic record, or that contains one or more electronic records, and that has specific methods for preservation and reproduction." If a digital component is a digital object, we may well want to know what a digital object is. I know I did, so I spent half an hour on the Web being told about digital object identifiers and being warned to beware of digital objects within digital objects, and generally getting the idea that a digital object was whatever one wants or needs to deal with in the digital environment. This vagueness about the character of digital objects only highlights the importance of identifying what one must preserve in order to perpetuate the elements conferring identity on the record. The details and results of this part of the process are at the heart of appraising electronic records, for they determine specifically in technological terms what needs to be preserved.

We definitely see it as a responsibility of appraisal to identify how the record and its elements are manifested in a digital thing or things that need to be preserved. In doing so, appraisers establish preservation requirements by identifying which digital things need to be preserved in order to ensure preservation of the authentic record. The next stage is to reconcile these preservation requirements with the preserver's preservation capabilities. Does the preserver currently have or can it expect to obtain the knowledge, hardware and software to deal with these particular digital things? The outcomes are information about the digital things to be preserved and information about the cost and technical capability required for continuing preservation of a given body of electronic records in authentic form, the feasibility information I already mentioned, which together with the assessment of continuing value make up the appraisal decision. It need hardly be said that the whole exercise falls down if the preserver lacks the capacity to preserve electronic records, which is still a condition more common than the obverse in much of the archival world.

Carrying Out Disposition

Carrying out the disposition of electronic records becomes much more sophisticated than has been the case for most traditional records. Appraisal proposes, someone must eventually dispose, that is, effect disposition according to the appraisal decision. This is no easy task. Among other things, it often means rousting officials in the creating body from the natural lethargy having to take a disposition action seems to induce in them, and convincing them to follow the terms and conditions of transfer to do the initial work to process electronic records for disposition to the preserver. As we see it, preparing records for disposition means copying and formatting records selected for preservation so as to prepare them physically for transfer, or, if the preserver must supervise or oversee the matter, to prepare those not selected for preservation for destruction, alienation to another entity, or such other disposition as determined in the appraisal decision.

The next step, one that either the creator or the preserver may take or they may take together, is to package the records selected for preservation with the necessary information for their continuing preservation, including the terms and conditions of transfer, identification of the digital components to be preserved, and associated archival and technical documentation needed for their treatment. The point here is that you cannot simply give all the information accumulated in the various records of the appraisal process to preservation specialists, and expect them to extract that which is relevant to their task. Transmitting electronic records, then, means sending them prepared for transfer, with the accompanying information necessary for continuing preservation clearly identified, to the office responsible for the preservation function.

Conclusion

Selection of electronic records differs little in the aspect of assessing continuing value as we have come to understand it for traditional records. However, the nature of the technological context brings an additional evaluative dimension, always latent with traditional records, into the foreground of appraisal of electronic records: the assessment of authenticity and the determination of the means to preserve electronic records in authentic form. As I have outlined, this is largely a matter of working out a very detailed process, highlighted by more intensive documentation procedures than most archivists are familiar with, rather than adoption of revolutionary theoretical ideas. Archivists will have to work harder to comprehend the wrinkles in the process needed to accommodate the twists and turns of the technology, and to document the facts about the records and their context that need to be communicated to posterity. One thing is clear, the range of selection activities together comprise the first vital step in the process of long-term preservation of authentic electronic records.

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Appendix I

Benchmark Requirements Supporting the Presumption of Authenticity of Electronic Records

Preamble

The benchmark requirements are the conditions that serve as a basis for the preserver's assessment of the authenticity of the creator's electronic records. Normally, these requirements will be taken into account by the appraiser in making an assessment of the authenticity of the records in any given case of appraisal. Satisfaction of these benchmark requirements will enable the preserver to infer a record's authenticity on the basis of the manner in which the records have been created and maintained by the creator.

Within the benchmark requirements, Requirement A.1 identifies the core information about an electronic record that will enable the preserver to establish its identity and infer its integrity. Requirements A.2-A.8 identify the kinds of procedural controls over its creation and maintenance that support a presumption of its integrity.

Benchmark Requirements

To support a presumption of authenticity the preserver must obtain evidence that:

Requirement A.1: Expression of Record Attributes and Linkage to Record	the creator has ensured that the value of the following attributes are explicitly expressed and inextricably linked to every record. These attributes can be distinguished into categories, the first concerning the identity of records, and the second concerning the integrity of records.	
	A.1.a	identity of the record:
	A.1.a.i	Names of the persons concurring in the formation of the record (that is, the names of the author, writer, addressee, originator)
	A.1.a.ii	Name of action or matter
	A.1.a.iii	Date (that is, document, archival and transmission dates)
	A.1.a.iv	Expression of archival bond (for example, classification code, file identifier)
	A.1.a.v	Indication of attachments [1]
	A.1.b	integrity of the record:
	A.1.b.i	Name of handling office [2]
	A.1.b.ii	Name of office of primary responsibility[3] (if different from handling office)
	A.1.b.iii	Indication of types of annotations [4] added to the record
	A.1.b.iv	Indication of technical modifications [5]

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1 The term attachment refers to those documents that constitute an integral part of the whole record, notwithstanding the fact that they exist as linked, but physically separate, entities. For example, all the documents that accompany the application for a patent for an invention are part of a single record, that is, the application.

2 The handling office is the office (or officer) that is formally competent for carrying out the action to which the record relates or for the matter to which the record pertains.

3 The office of primary responsibility is the office (or officer) given the formal competence for maintaining the authoritative record, that is, the record considered by the creator to be its official record.

4 Annotations are additions made to a record after it has been completed. Therefore, they are not considered elements of the record's documentary form.

5 Technical modifications are any changes in the digital components of the record as defined by the Preservation Task Force. Such modifications would include any changes in the way any elements of the record are digitally encoded and changes in the methods (software) applied to reproduce the record from the stored digital components. That is, any changes which might raise questions as to whether the reproduced record is the same as it would have been before the technical modification. The indication of modifications might refer to additional documentation external to the record that explains in more detail the nature of those modifications.

Requirement A.2: Access Privileges	the creator has defined and effectively implemented access privileges concerning the creation, modification, annotation, relocation, and destruction of records;
Requirement A.3: Protective Procedures: Loss and Corruption of Records	the creator has established and implemented procedures to prevent, discover, and correct loss or corruption of records;
Requirement A.4: Protective Procedures: Media and Technology	the creator has established and implemented procedures to guarantee the continuing identity and integrity of records against media deterioration and across technological change;
Requirement A.5: Establishment of Documentary Forms	the creator has established the documentary forms of records associated with each procedure either according to the requirements of the juridical system or those of the creator;
Requirement A.6: Authentication of Records	if authentication is required by the juridical system or the needs of the organization, the creator has established specific rules regarding which records must be authenticated, by whom, and the means of authentication;
Requirement A.7: Identification of Authoritative Record	if multiple copies of the same record exist, the creator has established procedures that identify which record is authoritative;
Requirement A.8: Removal and Transfer of Relevant Documentation	if there is a transition of records from active status to semi-active and inactive status, which involves the removal of records from the electronic system, the creator has established and implemented procedures determining what documentation has to be removed and transferred to the preserver along with the records.