

Appraisal of Electronic Information Systems

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For a fairly long time, German administrations have used electronic information systems widely. Such systems have by now replaced analog means of storing and processing pieces of information in many fields of public service. However, accessioning electronic data has not yet become part of the German archivist's daily routine. Many German archives have neglected the task of preserving digital records for a comparatively long time; however, challenges are also posed by the sui generis character of data contained in electronic information systems. For this reason, lessons learned in the analog world and in dealing with other forms of digital records apply only to a limited extent.

With that said, it is not surprising that Germany offers only a few universally applicable approaches to the appraisal of electronic information systems. Even though some of the major German archives have acquired a considerable amount of data and have addressed the subject in reports,² there are still few ideas or

¹ Translated by Nastasja Pilz, Dipl.-Übersetzerin, Mannheim.

² For example, Robert Kretzschmar and Christian Keitel, "The Archiving System DIMAG and its Development through Cooperation and Collaboration: Policy, Professional and Technical Aspects," in *Born Digital in the Cloud: Challenges and Solutions: Contributions to the 21th Archival Science Colloquium/International Symposium of*

professional discussions that reach beyond the individual case. In order to launch a fruitful debate, the archival appraisal research group of the Verband deutscher Archivarinnen und Archivare (VdA) has delved into the subject over the past years. In several working sessions, the VdA research group evaluated first-hand reports about practical examples of archiving data out of electronic information systems, examined the current status of the general debate on appraisal of analog and digital records, and discussed controversial questions and propositions. As a result, the research group issued the following text, which addresses not only the (few) experts in the field of long-term preservation of digital records but also the broad archive-affiliated public. Rather than considering the paper a finished document, VdA intends the paper to contribute to, or at least initiate, a lively debate. Should you wish to carry on the discussion, you are welcome to send feedback – in English or German – to the VdA blog editors: redaktion@vda-blog.de. (Please refer to this article in the subject line of your response.)

1. Over the past 20 years, the question of archiving electronic records has significantly influenced archivists' scholarly debate. The long-term storage of electronic data has for a long time been the focus of discussion, while their appraisal has just recently started to attract increasing attention. The following paper intends to contribute to the current state of the appraisal debate. In doing so, we will deal with only one group of electronic records, namely information systems. Information systems have so far seen early and comprehensive use in administrations. Archiving information systems particularly and imperatively requires professional and consolidated solutions that also address questions of appraisal. The propositions developed in this paper address all archivists, not only those involved in the field of digital preservation. Hence, the paper also presents suggestions that may already be understood among experts. We do not want to leave out these experts, though. The paper also intends to sharpen terms and ideas, to help establish them as standards, and to look beyond them. Despite all efforts to

InterPARES Trust, ed. Karen Anderson, Irmgard Becker, and Luciana Duranti (Marburg, Germany: Archivschule Marburg, 2018), 83–97; Kai Naumann, "Zwölf Jahre Lernen aus der Praxis: Überlieferungsbildung aus genuin digitalen Unterlagen beim Landesarchiv Baden-Württemberg," *Scrinium* 69 (2015): 115–36; Michael Wettengel, "Archivierung digitaler Datenbestände aus der DDR nach der Wiedervereinigung," in *Archivierung elektronischer Unterlagen*, ed. Udo Schäfer (Stuttgart, Germany: Kolhammer, 1999), 223–39; "16. AUdS-Tagung (Archivierung von Unterlagen aus digitalen Systemen)," Staatsarchiv St. Gallen, accessed 22 February 2019, <https://www.staatsarchiv.sg.ch/home/auds/16.html>.

consolidate technical guidelines in the appraisal of electronic records, the discussion this paper contributes to needs to be continued within the entire archivist community.

2. *Definition*

Electronic information systems are database-driven software solutions that serve to perform one or more specific tasks in administrative environments. In general, information systems are not meant to document the procedural character of administrative processes in the form of files. Rather, they help store pieces of information to enable users to connect and trace data via requests and to combine these data into case-specific reports. Administrations use information systems, for example, to compute taxes, to manage human resources, to keep and maintain registers, and to support legal proceedings. Some information systems are able to generate and store documents. Thus, information systems may be expanded and closely linked to workflow and document management systems. Information systems have evolved from paper-based records management systems and go back to indexes and to registry books kept by authorities for administrative purposes. While indexes, restricted by the physical medium, allow only one particular information structure, information systems enable the user to do the following:

- a. Select and categorize pieces of information from complex data pools: there are several authentic interpretations.
- b. Combine information and generate new information out of resulting data pools: it is even possible to connect information from other information systems and management systems.
- c. Export and further process pieces of information.

- 3 The appraisal process always starts off with a fundamental decision regarding whether an electronic information system is of permanent archival value. Unlike their technical structure, the subject matter and purpose of electronic information systems are easy to comprehend. With regard to content, their archival value is determined in line with general appraisal criteria established through documentation and appraisal strategies for particular social

or administrative areas. Documentation strategies and valuation methods should always be designed to take into account both analog and electronic sources of information. The synopsis then allows us to assess the formal and legal quality of the available information and is thus the precondition for setting up appraisal criteria. These help us decide which information medium qualifies for accession in terms of density and volume.

- 4 When appraising electronic information systems, it is essential to first determine, on the basis of general appraisal decisions, whether the purpose and informative content of a procedure are of permanent archival value. The majority of information systems used in administrative agencies (e.g., for timekeeping) likely have no archival value in the first place. Not until archivists have identified a system to have permanent archival value in general do they need to determine – also according to general appraisal criteria – whether the information contained in this system should be accessed in its entirety or in part by selection.
- 5 *Selection* means identifying portions of information for long-time preservation in an archive. The technical structure of information systems offers various sampling methods. Information systems are basically databases: they manage information about real-world subjects (e.g., people or objects), which are referred to as entities. Databases closely define their attributes or properties, such as name, place of residence, and profession. In the course of the appraisal process, the archivist identifies those portions of information within a system that have enduring value from an archivist's perspective, usually with regard to the user interfaces (i.e., the front ends). The identified portions of information do not need to be identical to the database (back-end) entities yet. During the technical implementation of the appraisal decision, however, it is imperative to map the information to selected database entities. In this respect, every appraisal decision ultimately defines the entities to be accessed, based on their informative contents.
 - a. There are databases wherein one particular entity has a clear priority – for example, the Swiss Building Insurance Register, digitized since 2004. The entities managed in this database primarily concentrate on the “building” entity.

- b. There are other databases, though, that focus on two or more entities – for example, the Teachers and Students Database (LUSD), introduced in the German state of Hessen in 2006. This system manages information on both teachers and students, so both groups are comparable entities. In this particular case, the archive decided to access only the student data, because it expected to find better documentation of the teacher data elsewhere. This exemplifies a general appraisal decision at the entity level.
- 6 For the purposes of appraisal, the entities identified as valuable need to be assigned content attributes that the archive considers worthy of preservation. The criteria may range from possible user preferences to the original context of information within the administrative procedures.

In the case of the Hessen Teachers and Students Database (LUSD), the archive acquired only basic information on individual students and their school careers (e.g., schools attended, change of school) but omitted detailed information such as the mobile phone numbers of parents or legal guardians.

In terms of content, the appraisal of electronic information systems first focuses on identifying and selecting entities with their corresponding and permanently valuable attributes – therefore reducing the data *model*. At this point, information systems allow more precise access to technically separable pieces of information than is usually the case with analog formats. Analog formats mostly contain fixed collections of information, which are not interchangeable or variable at will.

- 7 The next step provides the opportunity to pick out a sample of individual cases from the selected entity(ies) (e.g., to decide if the entity “students” should be reduced to information about students whose names start with a particular letter or who live in a particular region) in order to reduce the data volume. The following aspects are significant for the assessment:

- a. First of all, it is necessary to bear in mind that the data volume does not limit the future interpretability of the material. Even with higher amounts of data, simple queries from databases do not require extended research efforts by the user. The situation is different, however, with information systems that include complementary documents or other digital objects. In this case,

an increase in the amount of information increases the effort required for research, which is at best partially automated. Furthermore, the performance of technical recordkeeping systems deteriorates as larger amounts of data are taken into account, making the development of professional acquisition methods quite difficult.

- b. Guided by the idea of a citizen archive, some archives aim at broad biographical documentation. Archiving all individual cases in their entirety guarantees the survival of at least a basic data pool referring to the entities identified as worthy of preservation. This basic data pool may be an important source for local and/or genealogical historic research.
 - c. With regard to rising costs, we need to remember that the highest expenses always result from describing and editing database fields and from coding the interfaces. These interfaces ensure selected entities and attributes are exported into storable formats. In contrast, permanently storing data sets in character-based formats requires only minor efforts.
- 8 After selecting the entities and corresponding attributes in terms of content and, if necessary, further reducing the data sets, the archivist needs to determine the significant properties of the relevant information system. Properties of digital records qualify as significant if they are considered integral to the records' permanent value and attest to the authenticity of the information. Every technical representation of the information must preserve these properties. Significant properties hence constitute a subset of the properties the information system possessed in its original context (e.g., whether it was used to research, connect, aggregate, or process the data). An awareness of significant properties is essential in order to find qualified solutions to offer the users access to the digital archive material. Moreover, it guarantees the survival of all relevant information during preservation actions. It is the task of the responsible archive to decide, from an expert perspective, whether and to what extent a property qualifies as significant.

All technical decisions must depend on the definition of significant properties. For example, the Information System on Soil Contamination

(FIS StoBo) of the State Environment Agency of Nordrhein-Westfalen presents two alternative archiving options: it is possible either to save the entire database dump as a SIARD file or to accession case-related reports as PDF files. Which option we opt for is heavily dependent on whether we classify the complex relations of the original database as significant and thus worthy of preservation or consider it sufficient to preserve the “static” estate information recorded in the reports. In this case, we would consider the core property of the information system – the complex connectivity of different tables – as insignificant. Consequently, we would opt in favour of saving them as PDF files.

Information systems often already feature export or exchange interfaces set up for in-house administrative purposes. Archives may reuse these interfaces, provided they do not conflict with the objectives of the appraisal process. This sometimes results in a competition between the procedural standards of appraisal and the technical efforts to program the interfaces and thus requires careful consideration.

- 9 With regard to joint projects, where authorities of different administrative levels enter data into the same information system at the same time, the responsible archives should agree upon joint and cross-sectoral appraisal criteria, according to the principle of collaborative appraisal. If a single information system is independently employed by different administrative posts, it also makes sense to exchange views and experiences. The archives involved may, for example, agree upon a standardized technical acquisition format (with fixed definitions of entities and significant purposes) to reduce the efforts required to program interfaces. Although these agreements limit the archives’ autonomy, they will generate major synergistic effects.

In case an information system is employed by different posts at the same administrative level, the respective archive sections should also agree upon a joint approach.

One successful example of collaborative appraisal refers to the registers of births, marriages, and deaths. A common acquisition format has been developed by representatives of the Bundeskonferenz der Kommunalarchive (BKK) along with the Konferenz der Leiterinnen und Leiter der Archivverwal-

tungen des Bundes und der Länder (KLA).³ Until 2014, every administration nationwide was prompted to start managing these registers electronically.⁴

- 10 The appraisal of electronic information systems primarily focuses on the pieces of information recorded in the systems. Their original context cannot be permanently preserved – and often does not need to be. In order to transfer knowledge about the entire data model and the original system's scope of operation, the archive also needs to acquire the documentation of the respective system in addition to the mere data. The documentation may also include written documents, particularly handbooks and records, about the conceptual design and development of the information system. Moreover, screenshots work well to convey a look-and-feel impression of the original system.
- 11 In the case of active information systems that do not keep a history of their entries, content may be deleted at an early stage, partly because of automatic deletion routines established for reasons of data security. Hence, the content loses its archival value. The responsible archive must therefore prevent permanently valuable information from being lost through premature deletions by accessioning copies at regular intervals. However, this system may cause archives to store redundant pieces of information. An alternative option is to periodically acquire the data of those individual cases that are either entirely or partly marked for deletion. This is how the Landesarchiv Baden-Württemberg annually acquires information about prisoners to be released in the following year. The prisoner data must be deleted from the information system immediately after their release.
- 12 Appraising electronic information systems significantly affects the appraisal of analog and other digital records of the same social or administrative area. If an archive is able to acquire substantial master data from an information system, it may carefully consider whether to completely or partly refrain from archiving the corresponding analog or digital case records.

3 Formerly known as ARK.

4 Ralf-Maria Guntermann and Peter Worm, "Anforderungen an die Aussonderung aus elektronischen Personenstandsregistern," *Archivar* 66 (2013): 23–27.

In 2006, the Landesarchiv Baden-Württemberg acquired the software application PLUS (used for HR management of teaching staff and budget planning) from the Ministry of Education and Cultural Affairs. Since the information system contains basic data about the entire active teaching staff of the state of Baden-Württemberg between 1985 and 2005, the Landesarchiv may revisit the decision to archive the personal files/records, always being aware of the general objective to preserve key data sets of each individual case.⁵

This concept also works in reverse: if an information system serves only to assist other information carriers within the administration (e.g., if system data are to a great extent incorporated in electronic records) and if the acquisition of these other information carriers is much easier, or even scheduled, the archive may refrain from acquiring the information system itself.

The states of Berlin, Brandenburg, Hamburg, Hessen, Mecklenburg-Vorpommern, Nordrhein-Westfalen, and Schleswig-Holstein have adopted the information system Mehrländer-Staatsanwaltschafts-Automation (MESTA) to support the workflow of the public prosecutor's (general) office. The system allows its users to manage and research information about, for example, felonies, crimes, claimants, and defendants. All information managed via MESTA enters the prosecutors' records. Therefore, the Landesarchiv of Nordrhein-Westfalen has decided to archive the information in the form of these records. Irrespective of this decision, MESTA is considered an important appraisal tool thanks to its various filter functions.

Even if all information of permanent archival value enters the records, it might still make sense to also acquire data from the information system, since the information system offers further analysis options via requests.

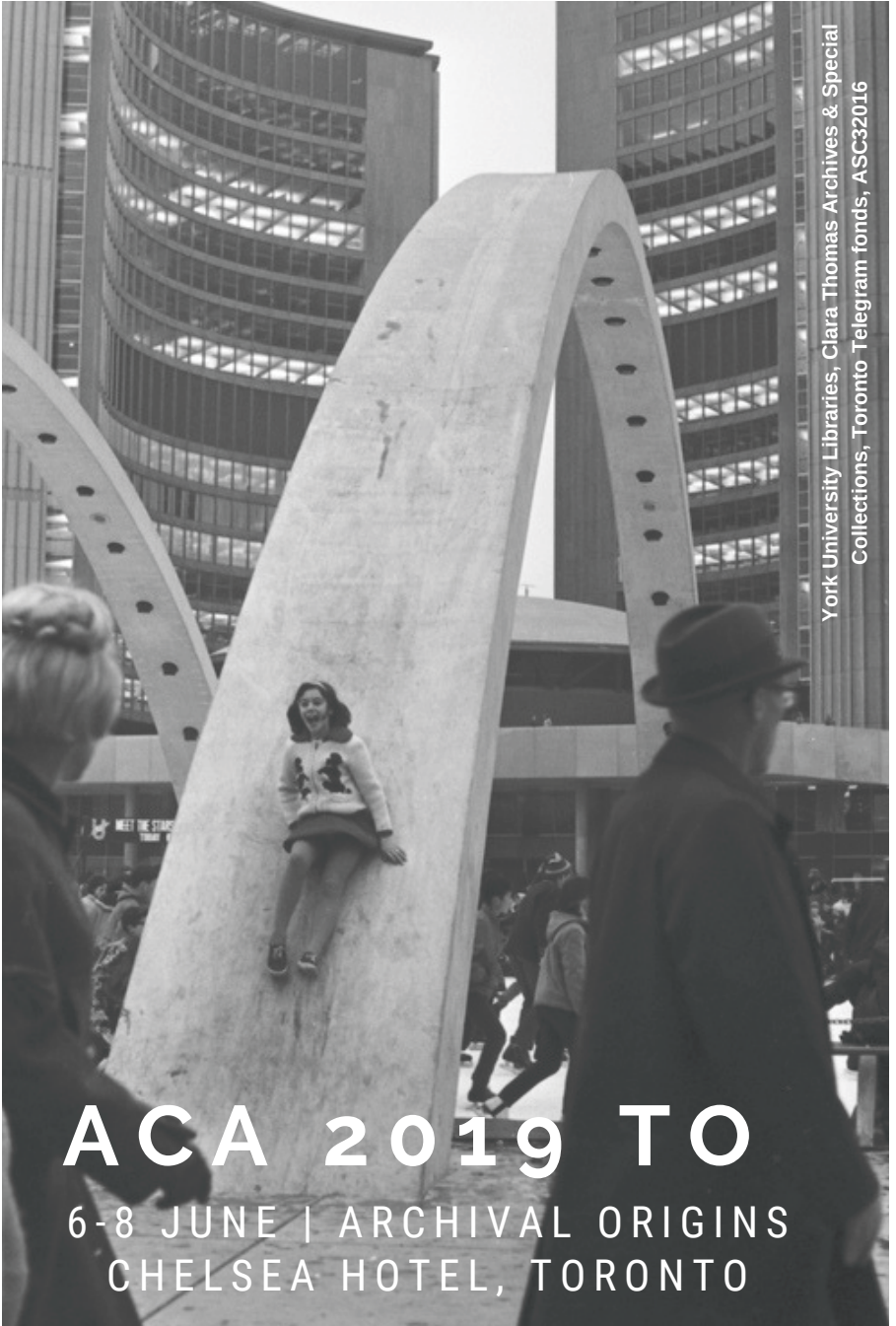
The Bavarian State Ministry of the Environment uses a water management information system (referred to as Wiski) containing, for example, water level measurement logs of Bavarian waters. These logs include both diagrams that have been available exclusively in digital form since 1970 and older diagrams that already existed in analog form. The old measurement data, some of which date back to the early 19th century, have been retroactively digitized and entered into Wiski. This allows the ministry to connect and aggregate the data and thus offers a wide variety of analysis

5 cf. 7. b.

options. These options do not exist with analog diagrams alone. First, you would have to enter the measured data into tables or manually convert them into a database. Therefore, it makes sense to archive the data from the information system even though the older data already exists in analog form.

These interdependencies show that the appraisal of electronic information systems strongly influences the creation of documentation profiles and appraisal standards right from the start.⁶ Archivists are asked to connect their lessons learned during the appraisal of analog records with new experiences made in the digital world. Combining the expert knowledge of all our fellow colleagues is essential to strike a new path in the fields of selection and acquisition.


6 cf. 3.



York University Libraries, Clara Thomas Archives & Special
Collections, Toronto Telegram fonds, ASC32016

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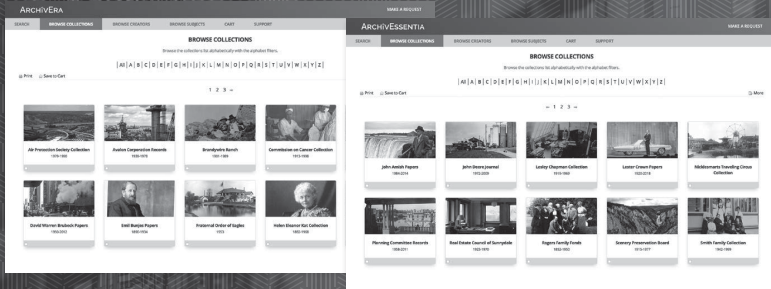
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