InterPARES 2 Project
International Research on Permanent Authentic Records in Electronic Systems

Diplomatic Analysis

Case Study 17:
New York State Department of Motor Vehicles
On-line Services System

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December 2006
(Updated April 2007)

INTRODUCTION

Case study 17 was proposed during the InterPARES 2 International meeting at Antwerp, Belgium, in June of 2003. It studies the online services systems operated by the Department of Motor Vehicles (DMV) in New York State and therefore falls under the InterPARES 2 scope of investigating governmental activities that generate digital entities in an interactive and dynamic environment. The online services system provides an alternative means for customers to conduct some, not all, of the business activities with the Department,[1] which include transactions such as renewing or replacing a driver's license, renewing or replacing a vehicle registration, replacing a title certification, ordering a driver's record abstract, paying fees, ordering personalized license plates, and scheduling a road test. Digital entities result from each of these transactions and exist as files in a database managed by the DMV's core mainframe system. Since the Final Report of this study focuses on digital entities generated from the online transactions of renewing or replacing driver's license and vehicle registration,[2] such digital entities (i.e., renewed or replaced licenses or registrations) are the objects that will be analyzed by this diplomatic analysis.[3] Closely related to these objects are three other types of digital entities: core records, audit trails, and driving records abstracts (which indicate customers' current status and historical transactions). A core record contains a customer's profile information, and its existence is a pre-condition for him or her to use the online services system.[4] An audit trail for a digital entity

[1] Currently, approximately 2-10% of all DMV transactions take place through the On-line Services System.
[2] The fact that these two online transactions are all about renewal and replacement is because, for the first driver's license or the first vehicle registration, users have to pay an in-person visit to the DMV offices, where, depending on their wish, they can also establish their identities for the subsequent use of the online system. See footnote 4 for information about the establishment of a personal identity.
[3] See answers to core research questions 1 and 2 in the Case Study 17 Final Report.
[4] More details regarding the core record from the report: Before any online service can be performed by a customer, a core record must exist for that customer. A core record is a record created for each individual DMV customer, containing information that uniquely identifies each customer. Core records cannot be created using the online system; they can only be created by authorized DMV personnel during an in-person office visit. This onsite transaction generates both paper and digital entities: user's inputs are

documents all accesses and changes made to that entity and its creation is embedded in business processes in accordance with business rules governing the online services system.[5] A driving record abstract is generated based on the information in the core record, the license file, and the audit trails of the customer and his or her transaction history. The diplomatic analysis will thereby be stretched to examine the three types of digital entities in order to provide a complete view of the digital licenses and registrations under analysis,

The following report presents the results of the analysis on the four groups of digital entities identified above: (1) core records, (2) renewed or replaced driver's licenses or vehicle registrations (exemplary entities of online transactions), (3) audit trails and (4) driving record abstracts. The purpose of the diplomatic analysis is to assess the status of these digital entities as records. Once the status of these digital entities has been determined, preservation strategies may be proposed by Domain 3.

IDENTIFICATION OF RECORD(S)

A record, as defined by the InterPARES glossary, is a document made or received and set aside in the course of a practical activity. A record must also possess all of the following five components, as established by InterPARES 1 research conclusions: fixed content and form, embedded action, archival bond, persons and contexts. The application of the definition of a record to the creator's digital entities is therefore analyzed according to the following parameters:

1. To be identified as a record, the digital entity must possess fixed content and form,[6] and be affixed to a stable medium (or physical carrier).

The contents of core records are subject to change. User information, such as name, address, and/or any other contact information, can be updated by authorized DMV personnel upon user requests.[7] Similarly, the contents of driver's licenses and vehicle registrations are also subject to change, and only their most current versions are maintained in the online system. However, the contents of the core records and licenses and registrations are considered stable due to the fact that all of the changes are records in audit trails that are linked to each customer and every transaction, and a query performed by staff can re-create any versions of an entity prior to the most current one.
New data are continuously added to audit trails but do not overwrite old data. The contents of audit trails are thereby considered stable as well.

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first recorded in a paper formal and then transferred by the staff member into the system's database. How these paper forms are managed is not discussed in the Final Report.

[5] Business rules refers to directives intended to guide or influence business behaviours (Ronald G. Ross, *Principles of the Business Rule Approach*. Addison Wesley Professional, 2003, 400.). The glossary in this book can be accessed at http://safari.awprofessional.com/0201788934/glossary.

[6] The InterPARES1 Authenticity Task Force has defined fixed form as the following: 1) binary content of the record, including indicators of documentary form, must be stored in a manner that ensures it remains complete and unaltered, and 2) technology must be maintained and procedures defined and enforced to ensure that the content is presented or rendered with the same documentary form it had when set aside. (See ATF Research Methodology Statement, available at: http://www.interpares.org/documents/interpares_ResearchMethodologyStatement.pdf).

[7] Core records cannot be accessed or modified by customers using the online system.

The content of a driving record abstract is decided by the specifications of the query that pulls out the various digital components of the abstract and presents it in an assembled full view on the screen. In accordance with the extended concept of stable content,[8] the content of an abstract generated in this fashion is considered stable.

The documentary form[9] of every version of the core record, license or transaction, audit trail, and abstract is fixed in the sense that their reproductions, upon retrieval, always retain the same appearance and content.[10]

Since all of the four groups of digital entities are stored in the DMV's back-end core system, they are fixed to a stable medium.

2. A record must also participate in an action, defined as the conscious exercise of will by an officer of the creator or by an external person, aimed to create, maintain, modify or extinguish situations. A record results as an unintended by-product or product of the action.

A user's core record participates in all of his or her online transactions. In other words, online transactions cannot take place unless the user has already had his or her core record created.

A license is a by-product of the business activity of establishing the user's status as a motor vehicle driver. In other words, it participates in the activity of granting a legal document that allows its holder to use a given vehicle. A renewed or replaced license is an end-product of the business process of renewing or replacing the original one through collecting new data. It is, however, a by-product of the overall licensing activity.

A registration is a by-product resulting from the business activity of collecting information about a given vehicle in relation to its owner for management purposes. In other words, a registration is an instrument employed by the Department to control the use of vehicles in its jurisdiction. A renewed or replaced registration is an end-product of the business process of renewing or replacing an original one through collecting new data. It is again, however, a by-product of the overall registration activity.

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[8] For further details and more examples on the extended concept of stable content, see Luciana Duranti and Kenneth Thibodeau (2006), "The Concept of Record in Interactive, Experiential and Dynamic Environments: the View of InterPARES," *Archival Science* 6(1): 13-68. Available at dx.doi.org/10.1007/s10502-006-9021-7.

[9] The InterPARES1 Authenticity Task Force defines documentary form as: The rules of representation according to which the content of a record, its administrative and documentary context, and its authority are communicated. Documentary form possesses both extrinsic and intrinsic elements. Intrinsic elements are the discursive parts of the record that communicate both the action in which the record participates and the immediate context. The types of intrinsic elements include name of author, name of originator, chronological date, name of place of origin of record, name of addressee(s), name of receiver(s), indication of action (matter), and name of writer. Extrinsic elements refer to specific, perceivable features of the record that are instrumental in communicating and achieving the purpose for which it was created. The types of extrinsic elements include overall presentation (e.g., textual, graphic, image, sound, or combination of these), specific presentation features (e.g., special layouts, hyperlinks, colors), and special signs (e.g., watermarks, logo). The report of the task force is available at http://www.interpares.org/book/interpares_book_d_part1.pdf.

[10] Based on InterPARES 2 findings, a digital entity has a fixed form when its binary content is stored so that the message it conveys can be rendered with the same presentation it had on the screen when first saved. Because the same presentation of a record can be produced by a variety of digital presentations, fixed form does not imply that the bitstreams must remain intact over time.

An audit trail participates in many business activities, depending on the use of the information it contains. For example, it can be used to check the authenticity of a digital record it has been tracing, or to recover transactions lost in the live system but documented by it. In the case of driver's license and vehicle registration, audit trails are used to provide information on the historical transactions associated with customers or vehicles. Therefore, they participate in the activities of generating documents containing such information under various requests. These requests can come from customers and third parties such as banks, insurance companies, and courts.

3. A record must possess an archival bond, which is the relationship that links each record to the previous and subsequent record of the same action and, incrementally, to all the records which participate in the same activity. The archival bond is originary (i.e., it comes into existence when a record is made or received and set aside), necessary (i.e., it exists for every record), and determined (i.e., it is characterized by the purpose of the record).

A core record for a given customer is linked, both conceptually and technically, to every transaction conducted between the customer and the DMV. Conceptually, transactions cannot take place without the existence of the core record; technologically, a core record can be accessed through each transaction record, and vice visa. Such linkages are the manifestation of the existence of archival bonds for both the core records and the transaction records, including the renewed or replaced licenses and registrations.

In addition to its relationship with the core record, a renewed or replaced license or registration has relationships with other digital entities such as its audit trail, emails regarding the renewal or replacement (if any), and any other documents required in the processes. These entities are stored in the system as a result of the transaction, and their archival bonds are expressed through the system's technological ability of providing access from one to another.

The archival bond of an audit trail is demonstrated by its ability to reproduce a non-current core record or a transaction record upon request.

The archival bond of a driving record abstract can be identified based on the content of the abstract and the understanding of its creation process. The content of the abstract shows its relationship with a customer or a vehicle and the creation process tells how and why the abstract is so presented. This understanding is important because it appears that DMV staff members do not save the abstract; instead, they use the digital abstracts to print paper records, which are then sent to requesters.[11]

[11] The Final Report actually identifies these paper records as the "official paper records," which have an official crest or logo and a watermark. It is not clear, however, whether the DMV keeps copies of these outgoing paper records.

4. Record creation must involve at least three persons, whether or not they explicitly appear in the record itself. These persons are the author, addressee and writer; in the electronic environment, one must also take into account two additional necessary persons: the creator and the originator.

- The record's **author** is the physical or juridical person having the authority and capacity to issue the record or in whose name or by whose command the record has been issued.

  The author of the four groups of digital entities—i.e., core records, renewed or replaced licenses and registrations, audit trails and driving record abstracts—is the DMV. These digital entities are created under the DMV's authority.

- The **addressee** the physical or juridical person(s) to whom the record is directed or for whom the record is intended.

  The addressees of core records are individual users of the online service system.

  The addressee of renewed or replaced licenses and registrations are the individual users who filed the online renewal or replacement requests. While DMV creates these entities in digital format,[12] they are sent to customers in paper formats.

  The addressees of audit trails are the DMV staff members who have access to them, and use them for their distinctive purposes.

  The addressees of abstracts are the various requesters, such as law firms, banks, insurance companies, and courts.

- The **writer** is the physical or juridical person having the authority and capacity to articulate the content of the record.

  The writer of the core records is the staff member in the DMV who is authorized to create them. Or, if they are created in a DMV office which is charged with such responsibility, then the office is the writer of the core records.

  The writers of the renewed or replaced licenses or registrations are the offices responsible for issuing licenses or for managing registrations, respectively.

  The writer of audit trails is the IT Department in the DMV (see also the Provenancial Context, below).

  The writer of the abstracts (presumably) is the office that is charged with responsibilities of dealing with outside requests. Or, in the case of driving record abstracts, it is possible that the licensing office is also the writer of the abstracts.

[12] This analysis assumes the DMV does not keep a copy of a paper license or a registration.

- The **creator** is the person in whose fonds the record exists.

  The creator of the four groups of digital entities is the DMV. The DMV satisfies the requirements of being a fonds creator (see details in the Provenancial Context below), and records generated in the course of carrying out its mandated functions and activities belong to the same fonds.

- The **originator** is the person to whom the Internet account issuing or the server holding the record belongs.

  As the DMV's URL shows (http://www.nydmv.state.ny.us), the originator of the four groups of digital entities is New York State.

5. Finally, a record must possess an identifiable context, defined as the framework in which the action in which the record participates takes place. The types of context include juridical-administrative, provenancial, procedural, documentary, and technological.

- The **juridical-administrative context** is the legal and organizational system in which the creating body belongs.

  The DMV added its online services system in 1998 and has continued to develop and expand the system under Governor George E. Pataki's New York's e-commerce initiative, which was established in 2000 to create a "Government without Walls." There are a number of laws and regulations applicable for its operation and for electronic records and their management. They are grouped in the following categories:

  a. Enabling law of the Department: The DMV's enabling law is the *New York State Vehicle and Traffic Law*, which establishes its powers and duties, lays out its basic structure and operational guidelines, and mandates specific programs.
  b. Regulations regarding the online system: The *New York State Office of Cyber Security and Critical Infrastructure Coordination Policy* (P03-002), the purpose of which is "to define a set of minimum security requirements that all state entities must meet."
  c. Laws relevant to electronic records and their management:
     - *The New York state Electronic Signatures and Records Act*,[13] a law signed on September 28, 1999, is part of the broader *State Technology Law*. It enhances and clarifies the authority of government to create and retain records in computer produced electronic form and stipulates that the use of an electronic signature have the same validity and effect as the use of a signature affixed by hand.

       Following are provisions with specific reference to electronic records:

[13] New York State, Office of Technology. *Electronic Signature and Records Act*. Available online at http://www.oft.state.ny.us/policy/esra/esra.htm.

§ 302. Definition

2. *"Electronic record" shall mean information, evidencing any act, transaction, occurrence, event, or other activity, produced or stored by electronic means and capable of being accurately reproduced in forms perceptible by human sensory capabilities.*

§ 305. Use of electronic records.

1. *In accordance with rules and regulations promulgated by the electronic facilitator, government entities are authorized and empowered to produce, receive, accept, acquire, record, file, transmit, forward, and store information by use of electronic means. If any such government entity uses electronic records, it must also ensure that anyone who uses the services of such government entity may obtain access to records as permitted by statute, and receive copies of such records in paper form in accordance with fees prescribed by statute (excerpt).*
2. *A government entity shall have the authority to dispose of or destroy a record in accordance with the arts and cultural affairs law, regardless of format or media.*
3. *An electronic record shall have the same force and effect as those records not produced by electronic means.*

§ 308. Personal privacy protection.

1. *(excerpt) Electronic records shall be considered and treated as any other records for the purposes of the freedom of information law as set forth in article six of the public officers law and the personal privacy protection law as set forth in article six-A of the public officers law.*

- *The Driver's Privacy Protection Act*, 18 U.S.C. section 2721 ff.. A federal law protects drivers' personal information by regulating how the DMV shares information in its records.

- *The New York State Arts and Cultural Affairs Law*, which regulates retention and disposition.[14]

d. Regulations on access to information: The New York State Office for Technology Statewide Technology Policy P04-002 and Mandatory Technology Standard S04-001. This policy and its accompanying technology standard are designed to ensure that state agency Web-based Internet and intranet information is accessible to persons with disabilities.
e. Regulations relating to business processes: Regulations established by credit card companies. As the online services system accepts payments via credit cards, it must comply with credit card company regulations.

[14] This law is not provided in the legal context section; rather, it appears in the section about documentary context.

f. Regulations (standards) relating to use of technologies:
    - The Internet Engineering Task Force Public Key Infrastructure X.509 (IETF PKIX) Part 4: Certificate Policy and Certification Practice Statement Framework.
    - The DMV's own standards for creating online transactions.

- The **provenancial context** refers to the creating body, its mandate, structure and functions.

  The online services system belongs to the DMV, which is one of twenty departments in the executive branch of the New York State government. The mission statement of Department states that the DMV "promotes traffic safety, provides consumer protection and information services and assists other government agencies to achieve their missions."

  The DMV's head is the commissioner of motor vehicles, appointed by the governor with the approval of the state senate. Reporting to the commissioner is an executive deputy commissioner. There are also deputy commissioners each specifically responsible for one of the functions mandated to the Department. The online system falls under the deputy commissioner for administration. Below him are individuals responsible for driver licensing, vehicle registration, and vehicle title, as well as the information technology department.

  The DMV is responsible for carrying out a variety of functions[15], but the online services system encompasses only a small part of its overall functions - approximately 2% to 10% of all DMV transactions take place through the online services system. These online transactions include:
    - Renewing or replacing a driver's license;
    - Renewing or replacing a vehicle registration;
    - Replacing a title certification;
    - Ordering a driver's record abstract;
    - Paying fees;
    - Ordering personalized license plates;
    - Scheduling a road test.

- The **procedural context** comprises the business procedure in the course of which the record is created.

  The procedural context is analyzed for the case of renewing a driver's license. The six **procedural phases** in the course of issuing a renewed license are:[16]

  a. **Initiative**: the introductory phase of any procedure is "constituted by those acts, written and/or oral, which start the mechanism of the procedure."[17]

[15] For a complete list of the functions carried out by the Department, see the Case Study 17 Final Report, p. 3.
[16] The phases of procedure as dictated by Diplomatic Analysis; see Luciana Duranti, *Diplomatics: New Uses for an Old Science* (Lanham, Maryland and London: The Scarecrow Press in association with the Society of American Archivists and the Association of Canadian Archivists, 1998), 115.
[17] Ibid.

An online renewal request placed by an individual (who already has a core record and a first license) initiates the renewal process.[18]

b. **Inquiry**: this preliminary phase "is constituted by the collection of the elements necessary to evaluate the situation."[19]

When filing the request, the customer's identity information (i.e., proof of identity) is demanded by the System to be provided, and this constitutes the stage of inquiry.

c. **Consultation**: this phase is "constituted by the collection of opinions and advice after all the relevant data has been assembled."[20]

The consultation phase refers to the System's comparing of the entered information with that in the corresponding core record and in the customer's current license.

d. **Deliberation**: this phase is "constituted by the final decision-making."[21]

The indication that the decision has been made to renew the license is expressed by the System's request of the customer to pay for service.

e. **Deliberation control**: this phase is "constituted by the control exercised by a physical or juridical person different from the author of the document embodying the transaction, on the substance of the deliberations and/or on its forms."[22]

Deliberation control is excised by the System's communication with credit card companies' records, which may or may not approve the payment.

f. **Execution**: "the documents created in this phase are the originals of those embodying the transactions."[23] In other words, the execution phase results in the issuing of the first record capable of producing the consequences intended by its author.

Once the payment goes through, the customer receives an onscreen confirmation that the transaction was successful, followed by an email confirmation. The System creates a renewed license that allows it to be printed onto paper format.

- The **documentary context** is defined as the archival fonds to which a record belongs and its internal structure.

The archival fonds of DMV is the aggregation of all of the records generated by the Department. These four groups of digital entities all exist as "files" in a database in the DMV's core mainframe system. Each file, such as a driver's license file or a registration file,

[18] Details are provided at http://www.nydmv.state.ny.us/licrenew/default.html.
[19] Duranti, op. cit.
[20] Ibid.
[21] Ibid.
[22] Ibid.
[23] Ibid., 116.

contains data on the current status of a driver or vehicle, as well as an audit trail that contains information about all past transactions connected to that record. The audit trail is arranged by the date and time of each transaction and also by category. The DMV does not use directories or subdirectories, but keeps everything in tables and databases. All digital entities are organized so that they reflect the record creating process. Date, time, and individual are the core elements that make the organization of the digital entities.

- **The technological context** is defined as the characteristics of the technological components of an electronic computing system in which records are created.

  The DMV's system was developed in two parts:

  1. The back end core system: a mainframe system originated in the 1960s and has been maintained and updated since that time by the New York State Office for Technology.

  2. The online services system: a Web-based system developed in 1998 using third-party and in-house products for software and security measures that interacts with the back-end system.

     a) Private information is ensured using Secure Socket Layer (SSL) technology
     b) VeriSign is used to verify the DMV Online Services as a legitimate business for the customer.
     c) Cookies are used to enhance the user's experience.

CONCLUSIONS

The above analysis demonstrates that the core records (i.e., user profiles) and audit trails satisfy all of the requirements of being digital records, unconditionally. The renewed or replaced driver's license and registrations in digital form can either be records or just drafts prepared for the generation of paper records, depending on the business procedures associated with the use of the online services implemented by DMV. Since the pertinent information is missing in the CS17 Final Report, the diplomatic analyses for these two groups of digital entities were conduced based on the assumption that DMV does not keep copies of the paper records, the generation of which is only for the purpose of sending them to customers or third parties. The assumption is made with the understanding that the system has the ability to re-create these digital entities any time upon request (at least currently), which reduces the necessity of keeping paper records. However, if DMV does keep copies of outgoing paper records and manages them as official records, these digital entities are only drafts of the official records.

There is also information missing in the CS17 Final Report that affects the examination of driving record abstracts as records and can cause different conclusions. Depending on the business procedures, these abstracts can either be records or simply just collections of data assembled on the fly. The diplomatic analysis for the abstracts was conducted based on the assumption that these abstracts are saved into the system every time after the externally-requested printouts are generated. Therefore, they satisfy the requirements of being records. If

they are not saved as abstracts, but, instead, the various parts of the abstracts are saved into different tables of the core database, these parts are not records but digital components of the core database, which, of course, can be treated as a digital record in its entirety capable of participating in numerous activities. Similar to renewed licenses or registrations, even if these abstracts are saved outside the database, they can be only drafts—not records—if the DMV keeps paper copies of each outgoing abstract and treat them as its records.