



InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems

Domain 3 Research Questions

Case Study 08: Mars Global Surveyor Data Records in the Planetary Data System

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1. **What types of entities does the diplomatic analysis identify in this case study? (i.e., records, publications, data, etc.)**

Diplomatic analysis has yet to be completed for the entities in this case study, which include Mars Global Surveyor mission data records and Planetary Data Systems records.

- 1a. **If there are no records, should there be records? If not, why not?**

Not applicable.

- 1b. **If there should be records, what kinds of records should be created to satisfy the creator's needs (as defined by an archivist)?**

Not applicable

- 1c. **What characteristics of records (as defined by an archivist) are missing yet necessary to preserve these entities?**

Not applicable

2. **Are the entities reliable? If not, why not?**

There are several procedures in place to control the creation of data and its inclusion in the Planetary Data System (PDS). This includes the *PDS Data Preparation Workbook*, which serves as a guide to the organization and preparation of datasets intended for submission to the PDS. All projects are also required to use a Project Data Management Plan, providing a general description of the project's data processing, cataloguing and communication plan.

3. Are the entities accurate? If not, why not?

Accuracy is of utmost importance to the creator, and is ensured through peer review, role-based authentication for access, and data integrity checks.

4. To what degree can the entities be presumed to be authentic, and why?

Benchmark Requirements Supporting the Production of Authentic Copies of Electronic Records (these apply to the creator):

1. Capture of identity and integrity metadata

The identity of the entities is assured by the presence of the following attributes:

- Names of persons concurring in the formation of the record
 - Author: NASA
 - Writer: Mars Surveyor Program
 - Originator: NASA
 - Addressee: NASA, the scientific community and the general public
- Name of the action or matter: the entities participate in the observation and collection of solar system scientific data.
- Expression of an archival bond: all data relating to the same observation are stored as a dataset, and related to other data in the Planetary Data System.
- The dates of creation and transmission, and the indication of attachments, are not noted.

The integrity of the entities is assured by the presence of the following attributes:

- Name of handling office: Jet Propulsion Laboratory, where the data are electronically deposited in the PDS.
- Name of Office of Primary Responsibility: the PDS Management Office
- Indication of annotations: ancillary information is added with the raw data into the PDS to create a dataset.
- Indication of technical modifications: not noted in the final report

2. Enforcement of access privileges

Access is controlled by role-based authentication. Formal release policies have been established to disseminate collected data to the scientific community in a timely manner.

3. Protection against loss and corruption

Standards and workflow procedures are in place to control the generation, validation and transfer plan of all PDS data.

4. Protection against media and technology obsolescence

A Persistent Object Preservation (POP) technique is used to ensure electronic records remain accessible through technological change; records are created to be self-describing and independent of specific hardware or software.

5. **Established documentary forms**
Entities are created as PDS structure objects, which outline the format in which data appear.
6. **Ability to authenticate records**
All data undergo peer review to determine its suitability for archiving. They are also run through the Volume Verifier program to validate the format and content of all product labels and confirm the integrity of data files using checksums.
7. **Procedures in place to identify the authoritative record**
Again, procedures are in place to control the generation, validation and transfer of the data; all data are also peer-reviewed and run through the Volume Verifier program.
8. **Procedures in place to properly document removal and transfer of records from the creator's originating system**
The *MGS Project Archive Generation, Validation and Transfer Plan* sets forth the roles and responsibilities for persons and organizations transferring MGS data records to the Planetary Data System.

Baseline Requirements Supporting the Production of Authentic Copies of Electronic Records (these apply to the preserver):

1. **Controls over Records Transfer, Maintenance, and Reproduction:**
As noted above, the *MGS Project Archive Generation, Validation and Transfer Plan* sets forth the roles and responsibilities for persons and organizations transferring data records to the Planetary Data System.
2. **Documentation of Reproduction Process and its Effects:**
The final report does not provide adequate information to answer this question.
3. **Archival Description:**
Standard terminology is maintained through the use of the *Planetary Science Data Dictionary* (PSDD) within the Planetary Data System. Metadata values for new data products are compared with the PSDD and existing values wherever possible.

5. For what purpose(s) are the entities to be preserved?

The entities should be preserved to maintain data from the Mars Global Surveyor mission, and allow further analysis and use of this information in the scientific community, and for the interest of the public at large.

6. Has the feasibility of preservation been explored?

Yes. The Planetary Data System was designed for long-term preservation, and routinely captures all digital entities within the scope of the activities covered. It is referred to as an “active archives.”

6a. If yes, what elements and components need to be preserved?

All elements of the PDS structure objects must be preserved; each form of structure object has specific standards. Product labels must also be preserved.

7. Which preservation strategies might most usefully be applied, and what are their strengths and weaknesses, including costs and degree of technical difficulty?

Preservation strategies are already in place; as noted above, the Planetary Data System was designed for long-term preservation, and routinely captures all digital entities within the scope of the activities covered as an “active archives.” There is no indication in the final report that the current preservation methods are not effective.

7a. Which alternative preservation strategies might be applied? What are their strengths and weaknesses, including costs and degree of technical difficulty?

Not applicable

8. What additional information does the preserver need to know to facilitate appraisal and preservation?

The preserver must be acquainted with the purpose and use of PDS data, and the technology used to create and capture this data.

8a. If required information is missing, where should it come from and how should it be made manifest?

NASA regulations, as well as numerous PDS workbooks and plans, provide information regarding the purpose of the PDS and the standards in place to manage the data within.

9. Are there any policies in place that affect preservation?

As an agency of the American government, the following legislation must be taken into consideration with record preservation: the National Aeronautics and Space Act (1958), mandating and authorizing NASA to undertake aeronautical and space activities, and NASA regulations published in the United States Code of Federal Regulations, Title 14. Persons involved are also subject to professional ethics.

9a. Are there any policies in place that present obstacles to preservation?

No such policies are noted in the final report.

9b. Are there any policies that would need to be put in place to facilitate appraisal and preservation?

No such policies are noted in the final report.