
**GEDI — Generic Electronic Document
Interchange**

Échange de documents électroniques génériques (GEDI)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 17933 was prepared by Technical Committee ISO/TC 46, *Information and documentation*, Subcommittee SC 4, *Computer applications in information and documentation*.

Annexes A and B of this International Standard are for information only.

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GEDI — Generic Electronic Document Interchange

1 Scope

This International Standard specifies a format for exchange of electronic document copies between computer systems. The format includes the definition of a GEDI Header containing information about the requester, Supplier, and format of the document and relevant bibliographic information.

This International Standard is applicable to computer systems supporting Interlibrary Loan and Document Transmission applications.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 2108:1992, *Information and documentation — International standard book numbering (ISBN)*.

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ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*.

ISO 3297:1998, *Information and documentation — International standard serial number (ISSN)*.

ISO 8601:1988, *Data elements and interchange formats — Information interchange — Representation of dates and times*.

ISO 10161-1:1997, *Information and documentation — Open Systems Interconnection — Interlibrary Loan Application Protocol Specification — Part 1: Protocol specification*.

ISO 10161-2:1997, *Information and documentation — Open Systems Interconnection — Interlibrary Loan Application Protocol Specification — Part 2: Protocol implementation conformance statement (PICS) proforma*.

RFC 959, *File Transfer Protocol (FTP)*, October 1985.

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1

consumer

application process that receives the GEDI record, processes the GEDI Header information, and makes one Electronic Document Copy available to the end user

3.2

domain

group of one or more Suppliers and one or more Consumers capable of engaging in Electronic Document Interchange Transactions between them, where a common agreement exists for 1) electronic document interchange format and compression algorithm, 2) electronic document transfer mechanism, and 3) network technology

3.3

Electronic Document Copy

the part of the GEDI Record that contains the electronic copy of the document

3.4

Electronic Document Interchange Transaction

complete cycle for the interchange of an Electronic Document Copy, starting with an electronic document residing at the Supplier and terminating with the completed delivery of that document to the Consumer

3.5

GEDI Domain

Domain in which the common agreements conform to this International Standard

3.6

GEDI Header

GEDI Cover

the first part of the GEDI Record containing information about 1) the format and version of the parts of the GEDI Record, 2) Electronic Document Exchange Transaction, 3) the bibliographic description of the electronic document, and 4) the format of the Electronic Document Copy

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3.7

GEDI Record

complete GEDI message, containing both the GEDI Header and Electronic Document Copy

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3.8

Relay

application process that receives a GEDI Record from a Supplier or Relay in one Domain and transmits it to another Relay or Consumer in a second Domain

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3.9

Supplier

application process that captures an Electronic Document Copy, creates a GEDI Record, and transmits that Record to a Consumer, perhaps via one or more Relays

4 Symbols and abbreviated terms

FTP

File Transfer Protocol

JFIF

JPEG File Interchange Format

JPEG

Joint Photographic Experts Group

MIME

Multipurpose Internet Mail Extensions

PDF

Portable Document Format

POP

Post Office Protocol

RFC

Request for Comment; and Internet standard or proposal

SMTP

Simple Mail Transfer Protocol

TIFF

Tagged Image File Format

5 Service model and topology**5.1 Introduction**

As the name indicates, the Generic Electronic Document Interchange (GEDI) is concerned with the interchange of documents in electronic form. From this concern, the emphasis of this International Standard lies in two areas:

- a) the definition of an Electronic Document Format;
- b) the description of the Interchange mechanism.

This concern is less wide in scope than that necessary to provide an Electronic Document Delivery service. Interchange is only a part of the whole process. To provide a complete delivery service, several other issues have to be addressed besides the two covered by GEDI.

The following elements are relevant to the complete delivery cycle of electronic documents.

- a) **Identifying and locating** — where the document is identified and the source location is established. This can be done through the use of on-line union catalogue access (for example using the ISO 23950 standard), or through off-line services such as CD-ROMs or paper catalogues.
- b) **Ordering** — where the required document is requested for delivery. This is functionally identical with issuing an Interlibrary Loan request. The GEDI Header information described in clause 7 takes the ISO ILL standard (ISO 10160) as a guideline for the document identification.
- c) **Digitization** — where a hard-copy document is transformed into an electronic image. This will be done through a scanning device.
- d) **Interchange** — where the actual transfer of the electronic copy takes place.
- e) **Hard-copy reproduction** — where the document's image is converted back to paper or other media. This will be done through a printing device.
- f) **Billing, accounting** and other administrative procedures.

All these elements can occur in several forms in practical situations; some might not be relevant in specific cases.

Interchange is a key element in this list as it effectuates the physical movement of a copy of a document. Other elements from the list could be absent in specific cases:

- identification and locating could be based upon common knowledge;
- ordering is not relevant in case of unsolicited delivery;

- digitalization is not necessary when documents have already been digitized, either through direct electronic publishing or through scanning and storing;
- reproduction can be skipped when an electronic copy is to be kept on a storage medium;
- billing and accounting are not relevant in cooperative services where participants share load and costs between them.

Therefore, the agreements reached in GEDI concentrate on interchange to provide common ground for the development of electronic document delivery services. On this basis, different electronic document delivery services would have the characteristics to easily enable development of links between them. Also, the development of the other elements constituting a full delivery service will benefit from international agreement on the interchange part.

The overall model that forms the basis of the International Standard within the scope of the interchange element of document delivery services is a global model. The source information that GEDI is concerned with, document images, is located around the world in various places. Likewise, the target clients of document delivery services are widely distributed. The model accommodates all sources and targets.

Furthermore, the model should recognize the responsibilities of a wide variety of organizations involved in document delivery to implement private solutions. In general, private solutions reflect agreements that exist between groups of organizations to optimize services between them. The GEDI model does not limit the possibilities and freedom of such agreements. In the end, the overall model aims at establishing common ground and direction guidelines for further development, to provide the possibility of interworking between such different groups.

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5.2 General model

The general model for the interchange process for electronic document delivery is represented in Figure 1. The main characteristics of the model can be described as follows:

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- a) the interchange involves two parties, the Supplier and the Consumer;
- b) the Supplier and Consumer are linked through a facility enabling the transfer of an electronic document from Supplier to Consumer;
- c) the transfer handles one document at a time.

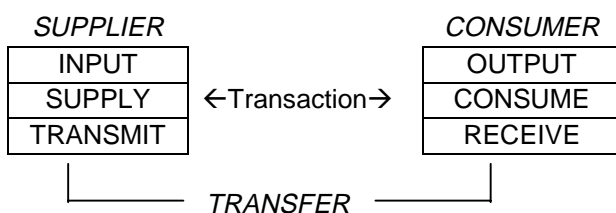


Figure 1 — General model for electronic document interchange

The complete cycle of interchange, starting with an electronic document residing with the Supplier and terminating with the completed delivery of that document to the Consumer is called a **Generic Electronic Document Interchange Transaction**.

It is important to note that the input and output functions as shown in Figure 1 do not participate in the transaction. The exact nature of these functions is outside the scope of this International Standard. Of course, in practical situations, some form of input and output will be available:

- input can come from hard-copy documents through scanning (the most probable form in the short term), from files with stored document images, or from electronically published documents;

- output can take the form of inserting an electronic document into a storage file, or printing. The implementation of some of these possibilities may be dependent on legal and copyright regulations.

5.3 The Domain concept

The model can be broken down into smaller parts by introducing the concept of Domains. This concept allows the solutions under private responsibilities in private Domains to be distinguished and made more or less independent of the solution on the common, international, GEDI domain. Common agreement is only required within the GEDI domain; GEDI might or might not be followed in private Domains.

The various private Domains will be interconnected through the services in the GEDI domain. Generally, private services are available on the basis of a variety of functional and network models reflecting the organizational structure within the private domain. From the definition of this International Standard, the Relay functions to be provided on the boundary between private and GEDI Domain can be specified.

A Domain is defined as a group of one or more Suppliers and one or more Consumers capable of engaging in Electronic Document Interchange Transactions between them, where a common agreement exists in the following areas:

- electronic document interchange format and compression algorithm;
- electronic document transfer mechanism;
- network technology.

The Domain agreements not only specify which mechanism or standard to use, but also select the appropriate options to be used by the Domain members. In this sense, the Domain members agree on a common profile. This reduces the complexity of the development of systems that form part of the domain.

In practice, the Domain agreements cover all communication layers, whether they conform to International Standards and the OSI model or not. For example, the agreements in a particular Domain might specify communication on the basis of FTP over TCP/IP; another Domain might use MIME over TCP/IP.

In the application layer, agreements on the document format are as important for the Domain as the communication profile. In such a context, Suppliers and Consumers share the same view of an electronic document, and do not need functions for converting and reformatting.

Using this Domain concept, it follows that a Supplier and a Consumer within the same Domain are capable of interconnecting directly. Conversely, if they form part of different Domains, they might not be able to do so, depending on whether the two Domains share the same agreements or not. Note that two Domains that are administratively separate may still share a common profile.

If the two Domains do not share the same agreements, the interconnection will be realized through an Application Relay function. The Application Relay will receive a GEDI Record using transfer mechanisms under the agreements of the first domain, and will transfer the record to the second Domain under the agreements of the second domain. Figure 2 sketches out the role of the Application Relay.

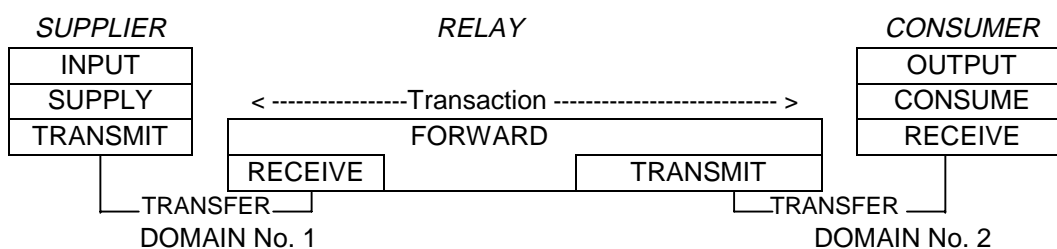


Figure 2 — Interchange across two Domains

Still, in the model of Figure 2, the Generic Electronic Document Interchange Transaction exists between Supplier and Consumer, with the Relay playing a supporting role

5.4 Functional elements

In Figure 2, all the model elements where Domain boundaries have to be crossed are shown. This model can be extended even further in cases where two Domains do not share a common Relay, but both have a Relay to a third domain. Subclause 5.5 will put this in context in the GEDI environment.

In this subclause, an overview of the functional elements shown in Figure 2 is given, together with the following characteristics of these elements.

- a) **Input**
This function is responsible for making an Electronic Document Copy available to the Supplier. The Supplier will only handle Electronic Document Copies in the agreed image format, so the input function produces Electronic Document Copies within the Domain agreements on Electronic Document Copy format. Examples of the input function are: scanning a hard-copy document; and reading an electronic document from a storage device.
- b) **Supply**
This function takes the result of the input function, the Electronic Document Copy, and produces a data structure to be transferred by adding information relevant to the transaction. This additional information is referred to as GEDI Header information, including the identification of the transaction, possibly a reference to an ILL transaction, the identification of the Electronic Document Copy, and information about the Supplier and Consumer. The supply function can also store the Electronic Document Copy temporarily before it is actually transferred, for example in situations where batches of Electronic Document Copies are being prepared for overnight transfer.
- c) **Transmit**
This function takes care of the actual sending of the Electronic Document Copy and the GEDI Header information through a network. The transfer function includes the complete communications stack, with all the applications and lower layer protocol services in the initiator or originator role.
- d) **Receive**
This function is the counterpart of the transmit function, and enables the receiving of the GEDI Record from the network. It is implemented using the same communication profile as the corresponding transmit function; it acts in the target or responder role.
- e) **Consume**
This function receives the GEDI Record, and analyses the content of the GEDI Header information to determine what actions should be taken. Generally, it will present the Electronic Document Copy to an appropriate output function. At the same time, the GEDI Header information can be passed to other applications, for example for administrative purposes.
- f) **Output**
This function takes care of the final reproduction or electronic filing of the received Electronic Document Copy. Examples are: printing of the Electronic Document Copy on a laser or other printer; permanent storage for later use.
- g) **Forward**
This function provides the possibility of communicating between two Domains. It has the capabilities to convert between the agreements of two Domains. In effect, it is located on the boundary of the two Domains, taking in GEDI Records from the one Domain and sending out GEDI Records in the other.

The functional elements described above combine within the model into the main model entities as follows:

- The entity **SUPPLIER** can be thought of as an application process with the functions: input, supply and transmit.
- The entity **CONSUMER** is the application process with the functions: receive, consume and output.

— The entity **RELAY** is the application process with the functions: receive (in one domain), forward and transmit (in another domain).

5.5 GEDI topology

In the GEDI environment, a number of private Domains will exist. These private Domains can be further subdivided into sub-Domains, for example where regional services link up to form a national service.

Relays between the private Domains and the GEDI Domain can be developed on the basis of this International Standard.

Figure 3 depicts the communication between a Supplier and a Consumer that belong to two different private Domains, using the services of two Relays.

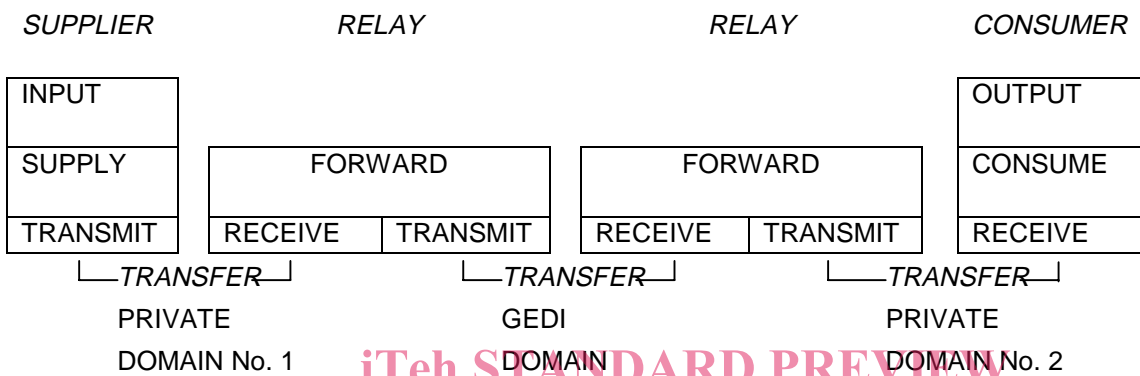


Figure 3 — Communication through the GEDI domain (standards.iteh.ai)

The abstract model definition in the previous subclauses describes all the entities and functional elements involved in Electronic Document Interchange. In a practical situation, these elements will be implemented through programs on computer systems, communicating through physical network links.

6 GEDI Record format structure

Documents will be exchanged in a GEDI Record, the format of which consists of two parts:

- a) the GEDI Header (cover information);
- b) the Electronic Document Copy.

By separating the GEDI Header from the Electronic Document Copy, Relay systems are relieved of the requirement to be able to read the document image format. This approach also makes it easier to accommodate new document formats in the future. See Figure 4.

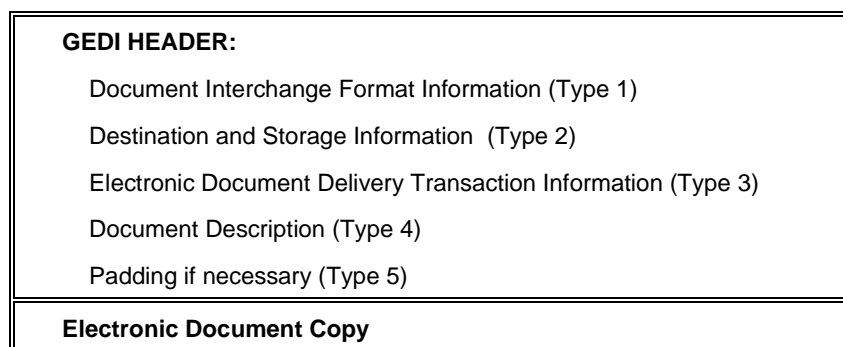


Figure 4 — GEDI Record Interchange Format