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Mapping rules and exchange methods for heterogeneous electronic parts libraries

Part 1: Building an integrated search system

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TECHNICAL REPORT

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Mapping rules and exchange methods for heterogeneous electronic parts libraries –
Part 1: Building an integrated search system

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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MAPPING RULES AND EXCHANGE METHODS FOR HETEROGENEOUS ELECTRONIC PARTS LIBRARIES –

Part 1: Building an integrated search system

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IEC TR 62699-1, which is a technical report, has been prepared by IEC technical committee 91: Electronics assembly technology.

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The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
91/1187/DTR	91/1200/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

A list of all parts in the IEC 62699 series, published under the general title *Mapping rules and exchange methods for heterogeneous parts libraries,* can be found on the IEC website.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

This technical report describes the methodology for integrated use of heterogeneous libraries of electric and electronic product parts to provide integrated services utilizing existing heterogeneous libraries. Integrated search of electronic parts information, for example, requires to integrate the electronic parts classification systems and the property classification systems that are possibly maintained by different nations in incompatible ways, in that not all the electronic parts information has one-to-one correspondence between parts libraries. Recently, Korea, China, and Japan jointly built an integrated search system to enable search of parts information across parts libraries that are independently operated by each country. The biggest challenge in this project was bridging the gap between these heterogeneous parts libraries by providing rules to integrate related parts information. The integration of information that has one-to-one (1:1) relation between different parts libraries is straightforward. However, integration of information that has one-to-many (1:N), or many-to-one (N:1) relation demands a standard rule of integration to provide a determinant search result, or service in general.

The integration rules specified in this technical report provide a foundation for utilization of the electronic parts libraries, possibly heterogeneously constructed by different organizations. The information systems constructed by the application of these integration rules can be the basis for constructing an integrated electronic parts e-sourcing system enabling real-time search of multinational electronic part databases with minimized loss of information.

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MAPPING RULES AND EXCHANGE METHODS FOR HETEROGENEOUS ELECTRONIC PARTS LIBRARIES –

Part 1: Building an integrated search system

1 Scope

This part of IEC 62699 describes mapping rules and exchange methods for the development of general and extendable integrated services utilizing heterogeneous multi-national or multi-enterprise electronic parts library data. The scope of this technical report is as follows:

a) identification and classification of mapping types for mapping heterogeneous electronic parts libraries;

b) definition of general mapping rules and specific mapping rules commonly applying to various mapping types.

The following aspects are out of the scope of this technical report:

- schematic definition and management of the electronic parts libraries to be mapped;
- maintenance process for the parts libraries during changes.

2 Application architecture

2.1 General

This clause illustrates the application architecture on which the mapping rules and methods are based. The information exchange methodology and interoperability are required for performing an integrated search by linkage of heterogeneous electronic parts libraries on the basis of the mapping dictionary.

2.2 Interoperability system

Figure 1 shows an interoperability system (IOS). It is constructed with common exchange rules and a mapping dictionary that apply between parties A, B and C. Each system, connected with the Internet, provides the communications environment that enables data exchange.

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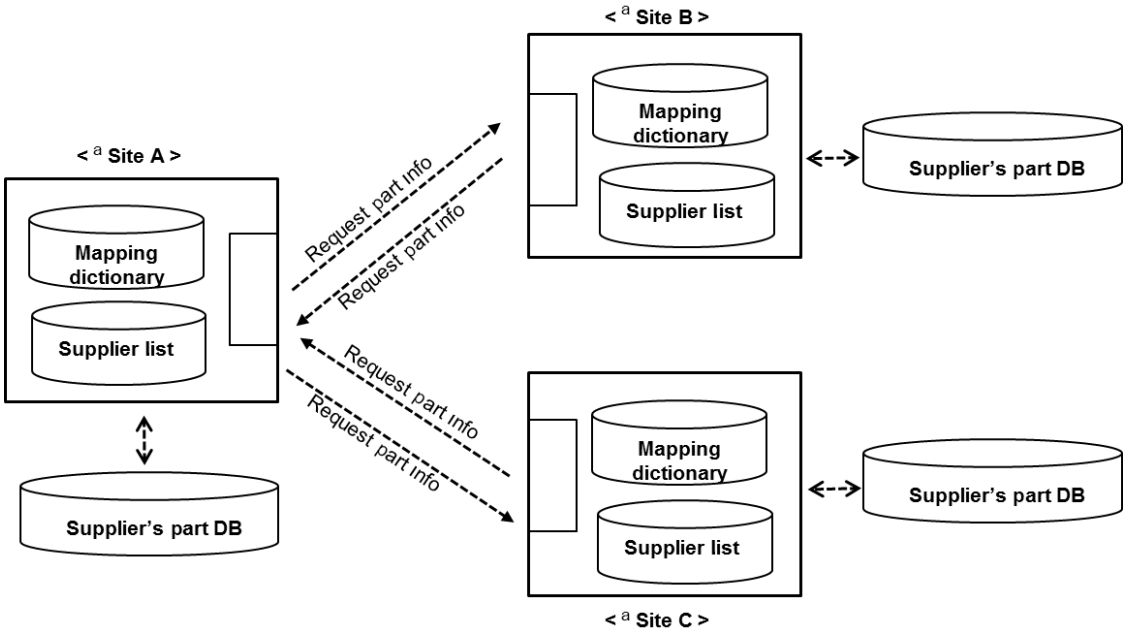

a) Site: nations, enterprises, organizations, etc. exchanging parts information

IEC

Figure 1 – Interoperability system status

The following items are involved in the construction of an application architecture.

- Interoperability system (IOS)

  It consists of the mapping dictionary, suppliers' list and the parts data base (DB) intended to design communications protocols and message exchange rules enabling interoperation, and to provide and exchange developed data communications programs and data.

- Mapping dictionary

  It constructs electronic parts libraries into the mapping dictionary for information exchange between sites.

- Part DB

  As detailed information of the parts listed in the mapping dictionary. It can be either operated on the same server as the interoperability system or constructed into a separate system depending on the information system environments of the concerned site.

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2.3 Architecture

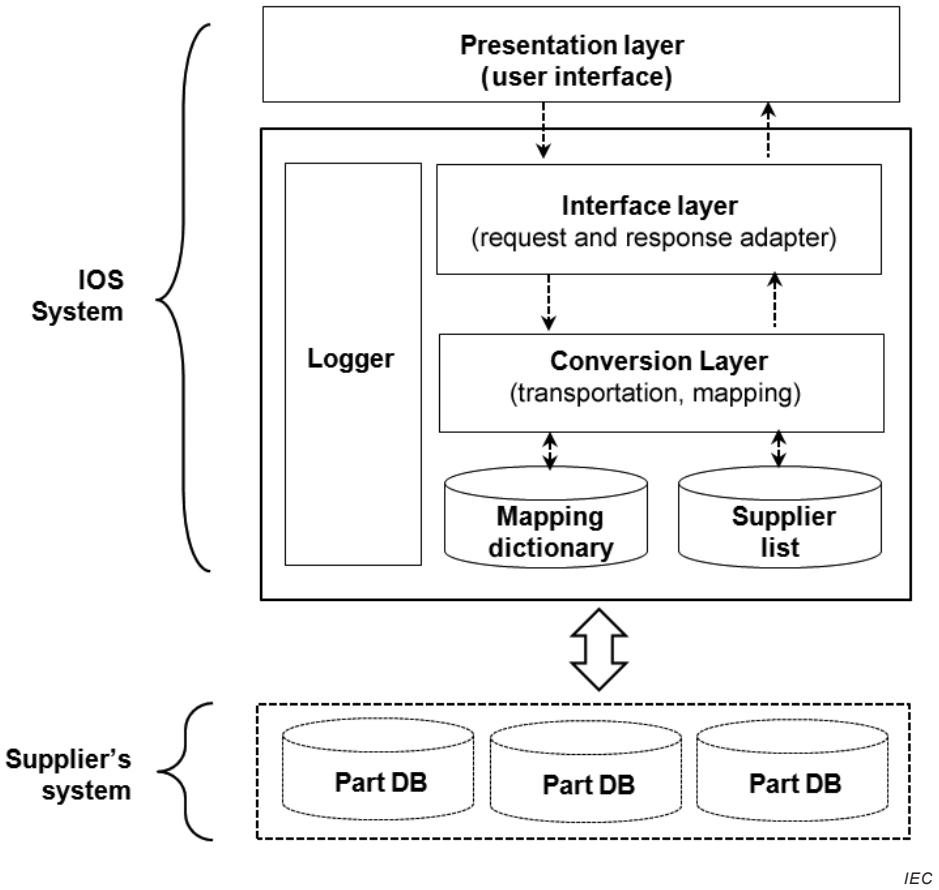

Figure 2 – Application architecture

Figure 2 shows the organization of the application architecture in which each component provides the functions as described below.

- Presentation layer (User Interface)

  It inputs search conditions for search of parts information and provides the user screen on which search results are displayed.

- Interface layer (request & response adapter)

  It consists of the request demanding the interoperability system to search the parts information according to search conditions (class, suppliers' list, property, etc.) and the response transporting the parts information search results corresponding to the requested search conditions in response to the request.

- Conversion layer (transportation, mapping)

  It executes data conversion and mapping in accordance with the requested search conditions and the IOS through the mapping dictionary and suppliers' list.

- Suppliers' list

  It is the supplier information corresponding to a parts class and includes information such as URL, address, etc.

- Mapping dictionary

  It is the repository in which parts classes of each interoperability system site to be exchanged are mapped. All the sites whose information will be exchanged should always be synchronized to ensure accurate information exchange.

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