TECHNICAL REPORT

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Graphic technology — Database architecture model and control parameter coding for process control and workflow (Database AMPAC)

Technologie graphique — Codage du modèle d'architecture de base de données et des paramètres de commande pour le contrôle du procédé et le déroulement des opérations (Database AMPAC)

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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 2.

The main task of technical committees is to prepare International Standards. 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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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

ISO/TR 16044 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

Introduction

The purpose of this Technical Report is to prepare a database architecture model and control parameter coding that can be widely applied to design, process control and workflow management in manufacturing processes focused on the graphic arts printing industry.

The proposed architecture model and parameter list with appropriate units and values will enable the exchange of information on a global scale that can be accessed freely using world wide distributed database approaches and can also be used effectively as part of process control techniques. Such enhancement of information exchange offers the potential for significant cost reductions and/or efficiency improvements.

In the proposed architecture, all of the parameters impacting a manufacturing system are classified by using a layer structure. The upper two layers categorize the systems and system elements and set the structure for the process. The following layers characterize the details of the parameters used in the system.

For using the defined parameters effectively in the graphic arts industry, an example of a data coding method is shown in Annex A. These may include

— standard formats that describe a variable and both the technical and functional relevancy to it of other parameters in the database;

— requirements for describing a subset where a group of parameters are combined to give technical information;

— any requirements relating to access and disclosure of a specific information item.

Such an architecture allows a well-defined complete set of unified parameters and thereby minimizes the difficulties that frequently occur because of the mismatch and misunderstanding about the parameters among different fields, different vendors and different countries. Using such an approach, each industrial field involving multiple participants can create an appropriate database that has a unified and exchangeable coded term, and communicates through a unified information transport system like the Internet.

In use in the graphic arts example, this architecture would tie the client, designer, material supplier, preprinting, print shop, prepress operators, printing and post-printing machine operators, machine manufactures and machine maintenance supporters together into a common communication database, making it much easier to connect one production facility and system to another, and to exchange and share knowledge about process operation and material usage between participants. Based on a unified code and composition, the necessary databases can be generated independently in distributed computer files, even in different companies and yet function together in an open printing production system.

It is envisioned that there would be two lines of communication in AMPAC. One consists of control parameters used as an intelligent database open to all clients, printing manufactures and vendors in the world. The other would restrict information to specific users as is commonly done on Internet websites.

Individual users could generate AMPAC-based databases at their sites for diverse applications including

— transmitting any material, machine and machine-element specifications to vendors, customers or other manufacturers;

— automatic process specification and workflow selection based on customer requirements for adapting to equipment and materials;

— search for common relationships among parameters such as the effect of temperature on the process;

— constructing simulated systems for process design and testing;

— troubleshooting using related parameters;

— maintaining compatibility of machines and systems.

Since the architecture and database model proposed in this Technical Report have the potential to create high level intellectual databases, they can be easily joined with the Commerce at Light Speed (CALS) and Intelligent Manufacturing System (IMS) concepts.

The development of a Technical Report of this type can also contribute to the establishment of other standards such as standardized workflow-management systems and/or digital network-production systems.

Four data files are associated with this Technical Report: AMPAC_Parameter_list.csv, which provides a lookup table for obtaining the code corresponding to the alphabet name of a parameter; DatabaseAMPAC_PT.txt, which joins all named parameters to parameter codes; DatabaseAMPAC_VE.txt, which provides a list of available values for non-physical parameters; and DatabaseAMPAC_DE.txt, which provides the corresponding SI-base unit with a named unit.

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1 Scope

This Technical Report specifies a basic standard architecture model and parameters used in a database for printing-process control and workflow description. It defines how all of the parameters impacting a manufacturing system are classified by using a layer structure. The upper two layers categorize the systems and system elements and set the structure for the process. The following third and fourth layers characterize all details of the parameters used in the printing system, including standard coding rules.

2 References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1000:1992, *SI units and recommendations for the use of their multiples and of certain other units*

ISO/IEC 646, *Information technology — ISO 7-bit coded character set for information interexchange*

3 Terms and definitions

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

3.1
ASCII
graphic character codes as defined in ISO/IEC 646

3.2
parameter
variable that specifies the state of an object

NOTE Two types of parameter are used in this Technical Report. One is the physical parameter, and the other is the non-physical parameter. The physical parameter is a variable that has a numeric value following its physical dimension given in SI units. The non-physical parameter is also a variable, but this one specifies the state of the object by using a non-numeric value that is assigned from a term or symbol list.

3.3
related parameter
another parameter that directly or indirectly affects the use of a required parameter

3.4
subset
set of parameters, selected from the Database AMPAC parameter list, to explain an object

EXAMPLE Objects may be machines, machine elements, materials or even concepts.