
Automation systems and integration — The Big Picture of standards

*Systèmes d'automatisation et intégration — Panorama des
documents normatifs*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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Introduction

The main objective of the Big Picture is to clarify the landscape of standards and standardization projects in smart manufacturing (covering all sectors of activity, all value chains, and all types of control: discrete, batch and continuous) by using clearly defined criteria of analysis (object of standardization, type of standard, industrial sector, life cycle, value chain, role level, etc.).

The IEC Sector Board 3 (SB3) activity began around 1997 and had members consisting of executives and technical managers from selected industrial sectors. The SB3 was assisted by a technical steering group of representatives from ISO/TC 184, IEC/TC 65 and other technical committees developing international standards for these industrial sectors. The SB3 efforts and deliverables (e.g. ISO/IEC Guide 75) focused on establishing the rationale, direction and strategic actions to assist both industry and the standards development organizations in assessing the market relevance of proposed standardization projects. The “Big Picture” project delivered necessary tools in realizing the SB3 objectives.

The first utilization of the term “Big Picture” by ISO/TC 184 was made by ISO/TC 184/SC 4/IMTF (Integrated Manufacturing Task Force) in its report to ISO/TC 184/SC 4 in 2001. This report was limited to the identification of the place and role of the various standards developed within TC 184/SC 4 and to their relationship. The main interests of this report were the first attempt for an overall representation of the ISO/TC 184/SC 4 area of work using a graphical representation on which each concerned standard or project of standardization can be placed as well as the methodology to obtain this representation.

This work was preceded by other work done in 1999 and 2000 by TC 184/SC 4/JWG 8, on the request of the Chairman of ISO/TC 184/SC 4, on “manufacturing related standards”. Nevertheless, this work includes preliminary considerations on redundancy, on the impact of the point of view used in each standard. It also includes a preliminary list of ISO/TC 184 and non ISO/TC 184 standards related to manufacturing as well as a first analysis of the relationships between features that can have the same naming in different standards but address concepts that are in fact different.

Later on, ISO/TC 184 set up a task force led by its Advisory Group and named “BSAD”, which was appointed to list the various areas of interest (universe of discourse) for ISO/TC 184 and its subcommittees. The objectives of this work was again to try to identify the place of existing standards and possible areas of work in the ISO/TC 184 “universe of discourse”, using a distinction between developments that are in the core of the scope of ISO/TC 184, areas that are impacted by ISO/TC 184 work and/or are likely to impact ISO/TC 184 developments, and areas that are just to be monitored according to the fact that they are in the “universe of discourse” of ISO/TC 184 without any other relationship with its work.

These activities were followed by the first attempts to carry the “Big Picture” effort to ISO/TC 184/SC 5 and finally at the ISO/TC 184 level (Louisville meeting between SC 4 and SC 5).

A common activity between ISO/TC 184 and IEC/TC 65 started in July 2008 by a meeting between Chairmen and continued with Joint Advisory Group meetings in 2009, in Frankfurt and Paris.

In 2010, a draft technical report was prepared.

In 2011, a renewed matrix and its user manual were circulated in ISO/TC 184 and IEC/TC 65. These documents were reviewed in the Joint Advisory Group meeting in 2011 (Berlin).

The ISO/TC 184 and IEC/TC 65 reference framework for the Big Picture was circulated at the end of 2011. Both ISO/TC 184 and IEC/TC 65 and their subcommittees populated the Big Picture Matrix on this reference framework.

This document is an update of the Big Picture reference framework circulated internally in ISO/TC 184 and IEC/TC 65 in 2011.

In 2012 and 2013, the French National Committee (AFNOR) continued refining the concepts.

In 2014 and 2015, EDF (Électricité de France) conducted a project for the exploiting of the Big Picture data in a smarter way. The project involved two academic institutions: Centre Universitaire d'Informatique (Geneva) and Centrale Lille\IG2I. The aim was to provide a “smart” access to