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Part 1: Architecture

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This fourth edition cancels and replaces the third edition (ISO/IEC 23005-1:2016), which has been technically revised.

The main changes compared to the previous edition are as follows:

— added a new use case for 3D printing;

— added six new use cases for olfactory information in virtual world;

— added two new use cases for virtual panoramic vision in car;

— added a new use case for adaptive sound handling.

A list of all parts in the ISO/IEC 23005 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The ISO/IEC 23005 series provides an architecture and specifies information representation of data flowing in and out of the real world and virtual worlds.

The data for the real world are communicated through sensors and actuators. The data for virtual worlds consist of properties of virtual objects and multi-sensorial data embedded in audio-visual content. The ISO/IEC 23005 series specifies data formats for sensors, actuators, virtual objects and audio-visual content.

Data captured from the real world can need to be adapted for use in a virtual world and data from virtual worlds can also need to be adapted for use in the real world. This document does not specify how the adaptation is carried out but only specifies the interfaces.

Data for sensors are sensor capabilities, sensed data and sensor adaptation preferences.

Data for actuators are sensory device capabilities, sensory device commands and sensory effect preferences.

Data for virtual objects are characteristics of avatars and virtual world objects.

Data for audio-visual content are sensory effects.

This document contains the tools for exchanging information for interaction devices. To be specific, it specifies command formats for controlling actuators (e.g. actuator commands for sensory devices) and data formats for receiving information from sensors (e.g. sensed information from sensors) as illustrated as the yellow boxes in Figure 1. It also specifies some examples. The adaptation engine is not within the scope.

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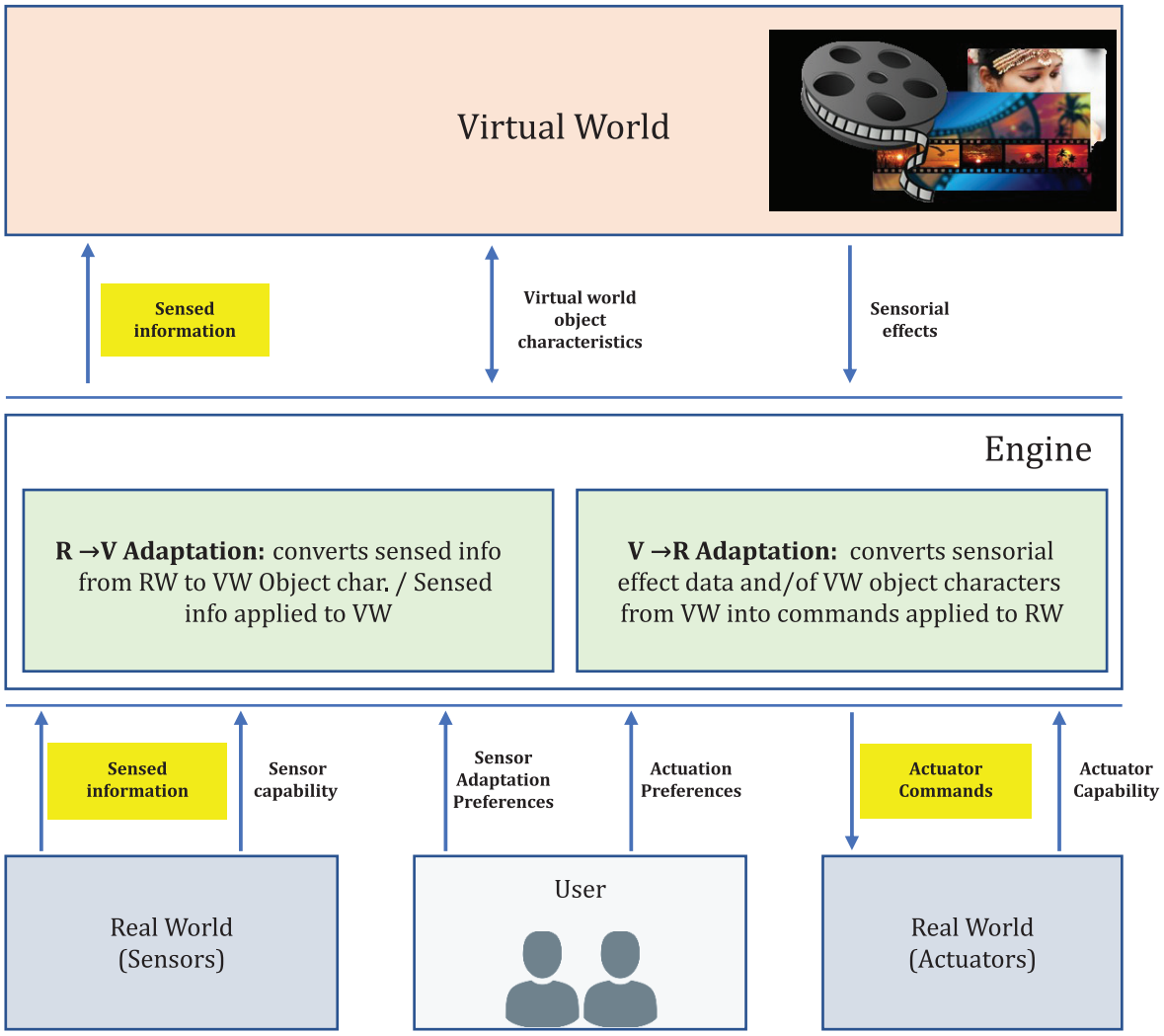


Figure 1 — Scope of the data formats for interaction devices

When this document is used, the adaptation engine (RV or VR engine), which is not within the scope of standardization, performs bi-directional communications using data formats specified in this document. The adaptation engine can also utilize other tools defined in ISO/IEC 23005-2, which are user's sensory preferences (USP), sensory device capabilities (SDC), sensor capabilities (SC) and sensor adaptation preferences (SAP) for fine controlling devices in both real and virtual worlds.

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

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Information technology — Media context and control —

Part 1:
Architecture

1 Scope

This document specifies the architecture of MPEG-V (media context and control) and its three types of associated use cases:

— information adaptation from virtual world to real world;

— information adaptation from real world to virtual world;

— information exchange between virtual worlds.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
device command
description of controlling actuators used to generate *sensory effects* (3.9)

3.2
R→V adaptation
procedure that:

— processes the *sensed information* (3.3) from the real world in order to be consumed within the virtual world's, context;

— takes the sensed information with/without the sensor capabilities from *sensors* (3.4), the *sensor adaptation preferences* (3.5) from *users* (3.12) and/or the virtual world object characteristics from a virtual world;

— controls the *virtual world* (3.13) object characteristics or adapts the sensed information by adapting the sensed information based on the sensor capabilities and/or the sensor adaptation preferences

3.3
sensed information
information acquired by *sensors* (3.4)

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