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Information technology — Concepts and usage of metadata —

Part 22: Registering and mapping development processes using ISO/IEC 19763

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Technologies de l'information — Concepts et utilisation des métadonnées —
Partie 22: L'enregistrant et mappant de processus de développement à l'aide de ISO/IEC 19763

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Foreword

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This document was prepared by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

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Introduction

The ISO/IEC 19583 series consists of Technical Reports showing how to implement ISO/IEC 11179 and ISO/IEC 19763.

When a software development project is started the project structure, consisting of processes, activities and tasks, is defined and described in the Project Initiation Document or Project Plan. The project deliverables are also defined in these documents. These documents are then maintained until the project is completed.

The project processes, activities and tasks can be modelled using a process model. A 'standard project process model' is defined in ISO/IEC/IEEE 12207 but the process model for each project should be defined and tailored to recognize the distinctive characteristics of that project. These tailored process models, and their associated deliverables, should be preserved so that the processes, activities, tasks and deliverables can be reused or adapted for new projects, enabling these new projects to be managed efficiently and effectively and at low risk.

ISO/IEC/IEEE 12207 establishes a common framework for software development, containing the processes, activities, and tasks that are to be applied during the whole lifecycle of a software product or service. In software development, each organisation establishes its standard processes based on the specification provided by ISO/IEC/IEEE 12207. During project initiation, the project manager defines the processes, activities, and tasks for the project by tailoring the standard processes so that the new project process model recognizes the distinctive characteristics of the project. For future projects with similar characteristics the new project will be more efficiently and effectively managed with higher quality deliverables produced at lower risk if an existing project process model can be easily reused.

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Information technology — Concepts and usage of metadata —

Part 22: Registering and mapping development processes using ISO/IEC 19763

1 Scope

This document provides a usage scenario that utilizes the facilities defined in ISO/IEC 11179-3, ISO/IEC 19763-5 and ISO/IEC 19763-10 to demonstrate the registration of the mapping between process models. The availability of these registered process model mappings will help to promote the reuse of process models.

The scope of this document is limited to a discussion of the process models associated with software development projects and the deliverables produced during these projects.

This document describes a scenario that evaluates the combined usage of ISO/IEC 11179-3, ISO/IEC 19763-5 and ISO/IEC 19763-10 to enable the reuse of past knowledge of process models describing project processes and deliverables.

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2 Normative references

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The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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/IEC 19763-1, *Information technology — Metamodel framework for interoperability (MFI) — Part 1: Framework*

ISO/IEC 19763-5, *Information technology — Metamodel framework for interoperability (MFI) — Part 5: Metamodel for process model registration*

ISO/IEC 19763-8, *Information technology — Metamodel framework for interoperability (MFI) — Part 8: Metamodel for role and goal model registration*

ISO/IEC 19763-10, *Information technology — Metamodel framework for interoperability (MFI) — Part 10: Core model and basic mapping*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19763-1, ISO/IEC 19763-5, ISO/IEC 19763-8, ISO/IEC 19763-10 and the following apply.

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

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

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

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3.1.1
activity
set of cohesive tasks of process

[SOURCE: ISO/IEC/IEEE 12207:2017, 3.1.3]

3.1.2
project
endeavour with defined start and finish criteria undertaken to create a product or service in accordance with specified resources and requirements

[SOURCE: ISO/IEC/IEEE 12207:2017, 3.1.37]

3.1.3
task
requirement, recommendation, or permissible action, intended to contribute to the achievement or one or more outcomes or process required, recommended, or permissible action, intended to contribute to the achievement of one or more outcomes of a process

[SOURCE: ISO/IEC/IEEE 12207:2017, 3.1.66]

3.2 Abbreviated terms

MDR metadata registry

MFI metamodel framework for interoperability

RDF Resource Description Framework

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4 Assumptions

4.1 Definition and registration of process models

It is assumed that process models are described by a specific modelling language and registered in accordance with the conditions specified in ISO/IEC 11179-6. Registration of the process models is enabled using the facilities specified in ISO/IEC 19763-3, ISO/IEC 19763-10 and ISO/IEC 19763-5.

4.2 Registration of mappings between process models

It is assumed that mappings between models are also registered in accordance with the conditions specified in ISO/IEC 11179-6. Registration of the mappings is enabled using the facilities specified in ISO/IEC 19763-3 and ISO/IEC 19763-10.

5 The usage scenario

5.1 Outline

This scenario illustrates the registration by an organization of the process models for software development projects, and the mappings between those process models, using the metamodels specified in ISO/IEC 19763-3, ISO/IEC 19763-10 and ISO/IEC 19763-5.

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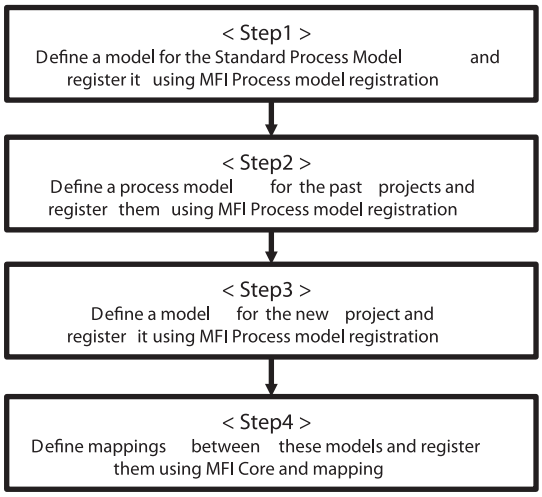

Figure 1 — Steps involved in the scenario

The steps involved in the scenario are shown in Figure 1. These steps allow the processes, activities, and tasks of similar projects included within the knowledge-base of successfully completed past projects to be easily reused.

5.2 Step 1: Define a model for the Standard Process Model and register it using ISO/IEC 19763-5

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The first step in the process is for the organization's Standard Process Model to be defined in accordance with ISO/IEC/IEEE 12207. Figure 2 shows a graphical representation of part of this model using the Resource Description Framework (RDF). In Figure 2, "spm" is a virtual name space that represents "Standard Process Model".

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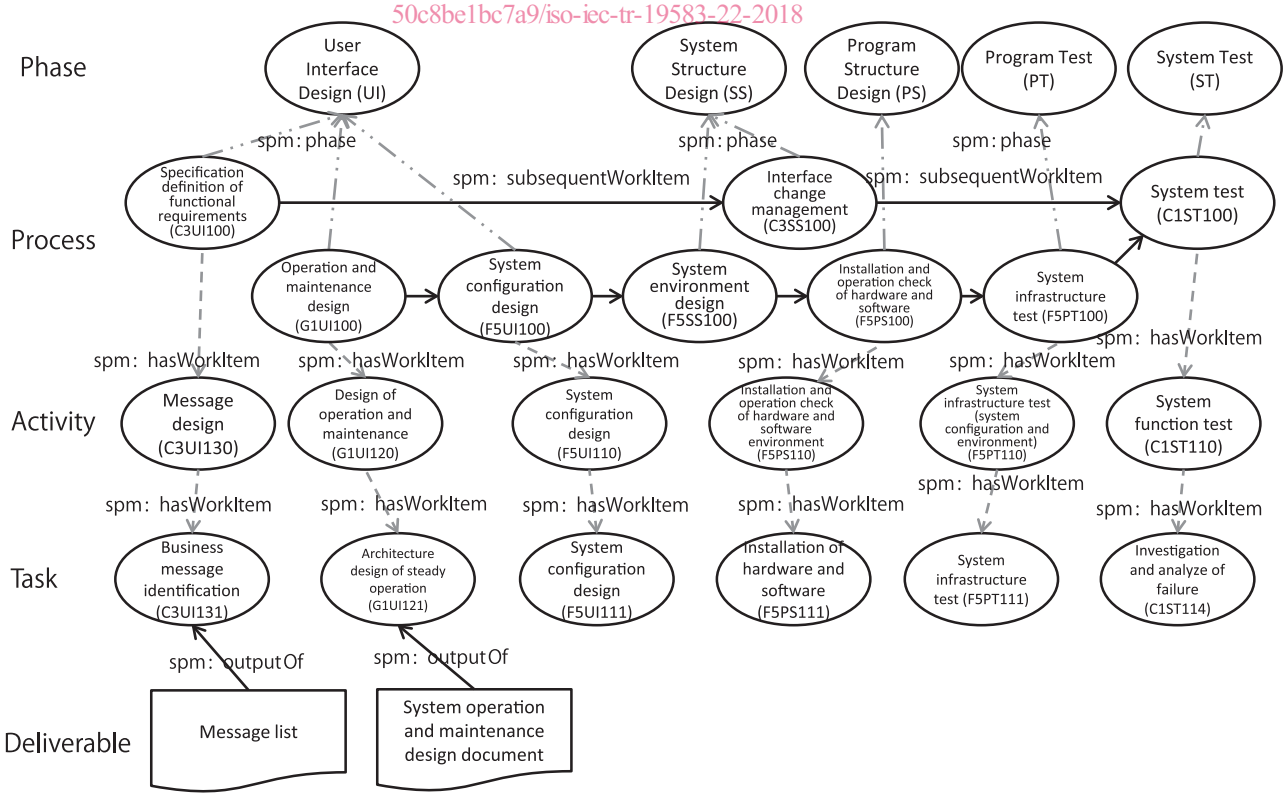

Figure 2 — Graphical representation of the Standard Process Model

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Figure 3 shows the actual RDF description of the part of the Standard Process Model shown graphically in Figure 2.

```
<rdf:RDF
 xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
 xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
 xmlns:dc="http://purl.org/dc/elements/1.1"
 xmlns:kd="http://hakusyu.org/2012/09/kd#"
 xmlns:spm="http://localhost/2016/11/m-r-spm#"
>

<spm:WorkItem rdfs:label="User Interface Design(C3UI100)"
rdf:about="http://localhost/Standard/WorkItem1_1">
 <spm:project>http://localhost/Standard/
</spm:project>
 <spm:subsequentWorkItem>http://localhost/Standard/WorkItem1_2</spm:subsequentWorkItem>
 <spm:hasWorkItem>http://localhost/Standard/WorkItem2_1</spm:hasWorkItem>
 <spm:workItemCode>C3UI100</spm:workItemCode>
 <spm:standardWorkItemCode>C3UI100</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>C3</spm:category>
 <spm:wbsLebel>1</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="Message design(C3UI130)"
rdf:about="http://localhost/Standard/WorkItem2_1">
 <spm:project>http://localhost/Standard/</spm:project>
 <spm:hasWorkItem>http://localhost/Standard/WorkItem3_1</spm:hasWorkItem>
 <spm:workItemCode>C3UI130</spm:workItemCode>
 <spm:standardWorkItemCode>C3UI130</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>C3</spm:category>
 <spm:wbsLebel>2</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="Business message identification(C3UI131)"
rdf:about="http://localhost/Standard/WorkItem3_1">
 <spm:project>http://localhost/Standard/</spm:project>
 <spm:workItemCode>C1ST100</spm:workItemCode>
 <spm:standardWorkItemCode>C3UI131</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>C3</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:Document dc:title="Message list" rdf:about="http://localhost/Standard/Document1">
 <spm:project>http://localhost/Standard/</spm:project>
 <spm:outputOf>http://localhost/Standard/WorkItem3_1</spm:outputOf>
 <kd:path>C:\ProjectStandard\Message list.xls</kd:path>
 <kd:updateDate>2010-06-07</kd:updateDate>
 <kd:createDate>2010-02-18</kd:createDate>
 <kd:creatorName>Mr. Standard</kd:creatorName>
 <kd:updaterName>Mr. Standard</kd:updaterName>
</spm:Document>

</rdf:RDF>
```

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Figure 3 — RDF representation of the Standard Process Model

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This RDF description of the Standard Process Model is then registered using the facilities specified in ISO/IEC 19763-5, and the associated facilities specified in ISO/IEC 19763-3 and ISO/IEC 19763-10.

Figure 4 shows the object instances to illustrate this registration.

<Process_Model>
Object101

Attribute/Reference	Literal/Instance
name	M-R-SPM_Reference_Model
describing_language	Object102
contained_process_model_element	Object103, Object104, Object105, Object106, Object107, Object108, Object109, Object111, Object114, Object115, Object116, Object117, Object118, Object119, Object124, Object125, Object126, Object127, Object128, Object129, Object130, Object131, Object133, Object134, Object135, Object136, Object137, Object138, Object139, Object143, Object144, Object145, Object146, Object147, Object148, Object149, Object150, Object153, Object154, Object155, Object156, Object157, Object158, Object159, Object160, Object163, Object164, Object165, Object166, Object167, Object168, Object169

<Process_Modelling_Language>
Object102

Attribute/Reference	Literal/Instance
name	M-R-SPM
version	1.0
expressed_model	Object101

<Process>
Object103

Attribute/Reference	Literal/Instance
name	User Interface Design(UI)
containing_model	Object101
successor	Object104, Object114, Object124

<Sequence_Dependency>
Object104

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object103
following_process	Object105

<Process>
Object105

Attribute/Reference	Literal/Instance
name	User Interface Design(C3UI100)
containing_model	Object101
successor	Object106, Object111

<Sequence_Dependency>
Object106

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object105
following_process	Object107

<Process>
Object107

Attribute/Reference	Literal/Instance
name	Message design(C3UI130)
containing_model	Object101
successor	Object108

<Sequence_Dependency>
Object108

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object107
following_process	Object109

<Process>
Object109

Attribute/Reference	Literal/Instance
name	Business message identification(C3UI131)
containing_model	Object101
created_resource	Object110

<Resource>
Object110

Attribute/Reference	Literal/Instance
name	Message list
containing_model	Object101
creator	Object109

<Sequence_Dependency>
Object111

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object105
following_process	Object137

<Sequence_Dependency>
Object114

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object103
following_process	Object115

<Process>
Object115

Attribute/Reference	Literal/Instance
name	Operation and maintenance design(G1UI100)
containing_model	Object101
successor	Object116, Object130

<Sequence_Dependency>
Object116

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object115
following_process	Object117

<Process>
Object117

Attribute/Reference	Literal/Instance
name	Design of operation and maintenance (G1UI120)
containing_model	Object101
successor	Object118

<Sequence_Dependency>
Object118

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object117
following_process	Object119

<Process>
Object119

Attribute/Reference	Literal/Instance
name	Architecture design of steady operation
containing_model	Object101
created_resource	Object120

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<Resource>
Object120

Attribute/Reference	Literal/Instance
name	System operation and maintenance design
containing_model	Object101
creator	Object119

<Sequence_Dependency>
Object124

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object103
following_process	Object125

<Process>
Object125

Attribute/Reference	Literal/Instance
name	System Configuration design (F5UI100)
containing_model	Object101
successor	Object126, Object131

<Sequence_Dependency>
Object126

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object125
following_process	Object127

<Process>
Object127

Attribute/Reference	Literal/Instance
name	System Configuration design (F5UI110)
containing_model	Object101
successor	Object128

<Sequence_Dependency>
Object128

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object127
following_process	Object129

<Process>
Object129

Attribute/Reference	Literal/Instance
name	System Configuration design (F5UI111)
containing_model	Object101

<Sequence_Dependency>
Object130

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object115
following_process	Object125

<Sequence_Dependency>
Object131

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object125
following_process	Object135

<Process>
Object133

Attribute/Reference	Literal/Instance
name	System Structure Design (SS)
containing_model	Object101
successor	Object134, Object136

<Sequence_Dependency>
Object134

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object133
following_process	Object135

<Process>
Object135

Attribute/Reference	Literal/Instance
name	System environment design (F5SS100)
containing_model	Object101
successor	Object136, Object138

<Sequence_Dependency>
Object136

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object133
following_process	Object137

<Process>
Object137

Attribute/Reference	Literal/Instance
name	Interface change management (C3SS100)
containing_model	Object101
successor	Object136, Object139

<Sequence_Dependency>
Object138

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object135
following_process	Object145

<Sequence_Dependency>
Object139

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object137
following_process	Object165

<Process>
Object143

Attribute/Reference	Literal/Instance
name	Program Structure Design (PS)
containing_model	Object101
successor	Object144

<Sequence_Dependency>
Object144

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object143
following_process	Object145

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