TECHNICAL REPORT

ISO/IEC TR 19583-22

First edition
2018-07

Information technology — Concepts and usage of metadata —

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

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

Reference number
ISO/IEC TR 19583-22:2018(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 document 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

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

A list of all parts in the ISO/IEC 19583 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.

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.

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.

2 Normative references

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

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

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.

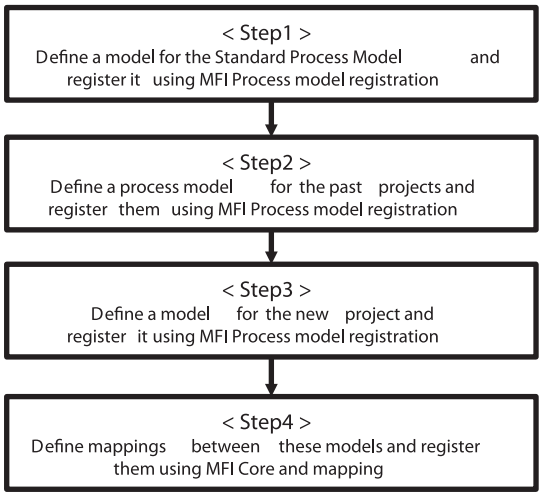

Figure 1 — Steps involved in the scenario

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

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".

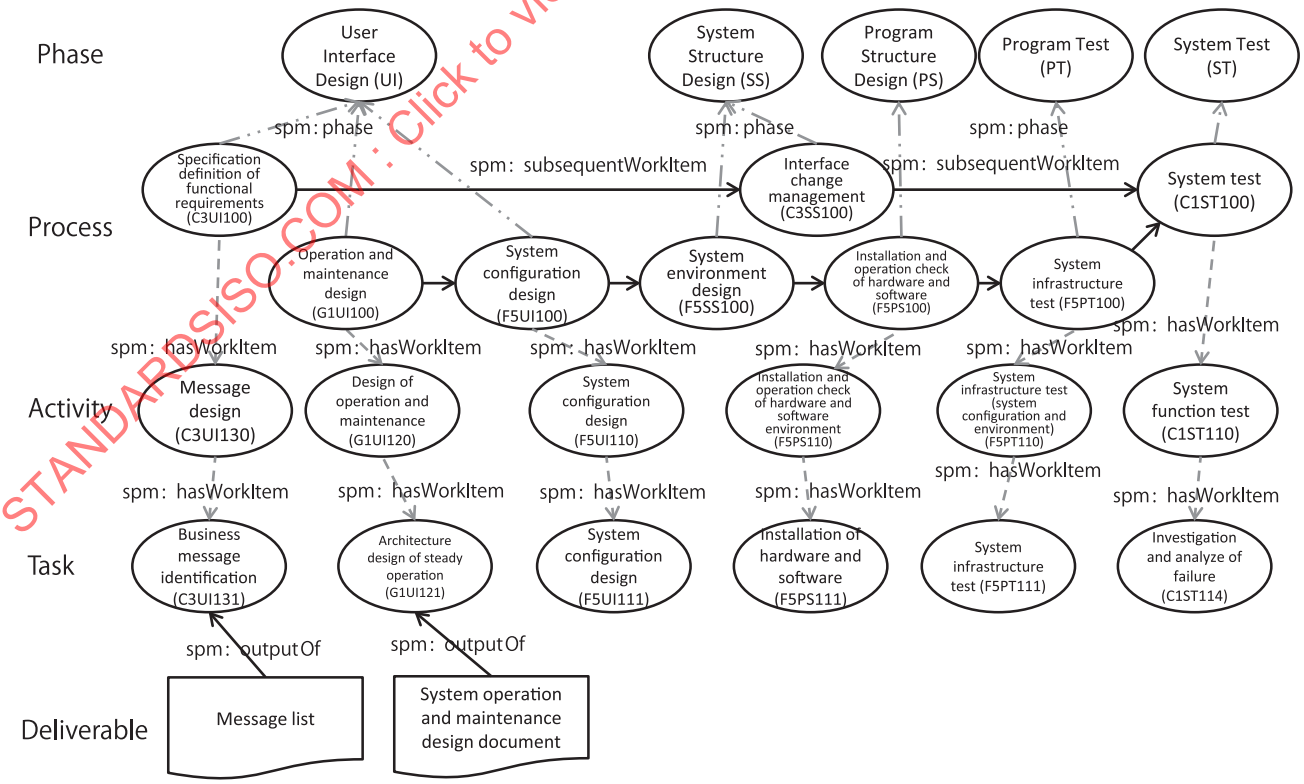

Figure 2 — Graphical representation of the Standard Process Model

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>
```


Figure 3 — RDF representation of the Standard Process Model

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

<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

<Process>
Object145

Attribute/Reference	Literal/Instance
name	Installation and operation check of hardware and software (F5PS100)
containing_model	Object101
successor	Object146, Object150

<Sequence_Dependency>
Object146

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object145
following_process	Object147

<Process>
Object147

Attribute/Reference	Literal/Instance
name	Installation and operation check of hardware and software envrironment (F5PS110)
containing_model	Object101
successor	Object148

<Sequence_Dependency>
Object148

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object147
following_process	Object149

<Process>
Object149

Attribute/Reference	Literal/Instance
name	Installation of hardware and software (F5PS111)
containing_model	Object101

<Sequence_Dependency>
Object150

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object145
following_process	Object155

<Process>
Object153

Attribute/Reference	Literal/Instance
name	Program Test(PT)
containing_model	Object101
successor	Object154

<Sequence_Dependency>
Object154

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object153
following_process	Object155

<Process>
Object155

Attribute/Reference	Literal/Instance
name	System infrastracture test (F5PT100)
containing_model	Object101
successor	Object156, Object160

<Sequence_Dependency>
Object156

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object155
following_process	Object157

<Process>
Object157

Attribute/Reference	Literal/Instance
name	System infrastructure test (system configuration and environment) (F5PT110)
containing_model	Object101
successor	Object158

<Sequence_Dependency>
Object158

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object157
following_process	Object159

<Process>
Object159

Attribute/Reference	Literal/Instance
name	System infrastructure test (F5PT111)
containing_model	Object101

<Sequence_Dependency>
Object160

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object155
following_process	Object165

<Process>
Object163

Attribute/Reference	Literal/Instance
name	System Test (ST)
containing_model	Object101
successor	Object164

<Sequence_Dependency>
Object164

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object163
following_process	Object165

<Process>
Object165

Attribute/Reference	Literal/Instance
name	System test (C1ST100)
containing_model	Object101
successor	Object166

<Sequence_Dependency>
Object166

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object165
following_process	Object167

<Process>
Object167

Attribute/Reference	Literal/Instance
name	System function test (C1ST110)
containing_model	Object101
successor	Object168

<Sequence_Dependency>
Object168

Attribute/Reference	Literal/Instance
containing_model	Object101
preceding_process	Object167
following_process	Object169

<Process>
Object169

Attribute/Reference	Literal/Instance
name	Investigation and analyze of failure (C1ST114)
containing_model	Object101

Figure 4 — Object instances for the registration of the Standard Process Model

5.3 Step 2: Define a process model for the past projects and register them using ISO/IEC 19763-5

Having defined and registered the Standard Process Model, the process models, and associated deliverables, for past projects are now registered. For example, consider ProjectABC. This was a project for the development of a new order system for the distribution industry. Within this project, the actual total amount of sales was 5,5 million yen and the actual total cost was 4,2 million yen.

Figure 5 shows a graphical representation of the process model for ProjectABC.

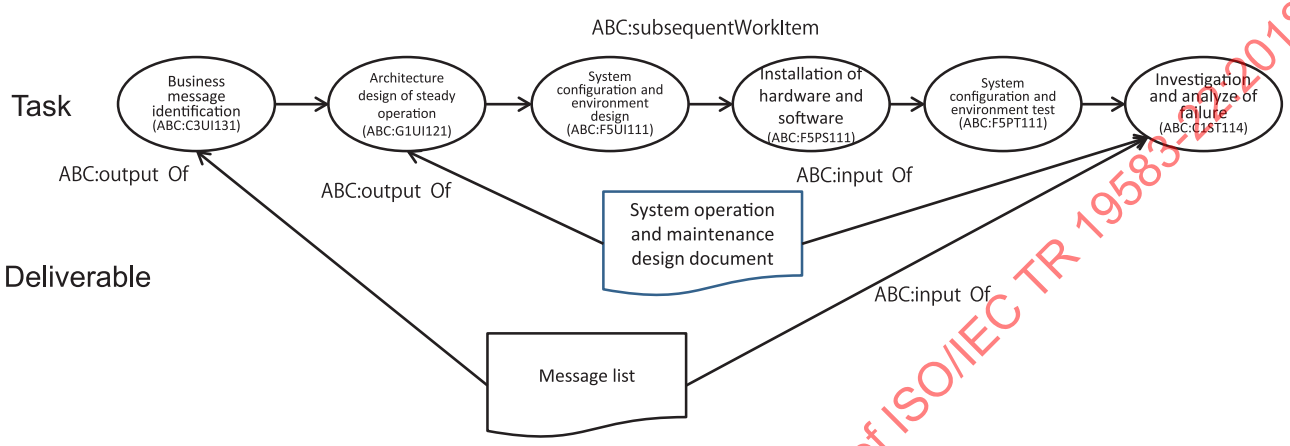

Figure 5 — Graphical representation of the process model for ProjectABC

Figure 6 shows the equivalent RDF description for the ProjectABC process model shown in Figure 5.

```
<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="Business message identification (ABC:C3UI131)"
rdf:about="http://localhost/ABC/WorkItem3_1">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:subsequentWorkItem>http://localhost/ABC/WorkItem3_2</spm:subsequentWorkItem>
 <spm:workItemCode>C3UI131</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:WorkItem rdfs:label="Architecture design of steady operation (ABC:G1UI121)"
rdf:about="http://localhost/ABC/WorkItem3_2">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:subsequentWorkItem>http://localhost/ABC/WorkItem3_3</spm:subsequentWorkItem>
 <spm:workItemCode>G1UI121</spm:workItemCode>
 <spm:standardWorkItemCode>G1UI121</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>G1</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="System configuration and environment design (ABC:F5UI111)"
rdf:about="http://localhost/ABC/WorkItem3_3">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:subsequentWorkItem>http://localhost/ABC/WorkItem3_4</spm:subsequentWorkItem>
 <spm:workItemCode>F5UI111</spm:workItemCode>
 <spm:standardWorkItemCode>F5UI111</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>F5</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="Installation of hardware and software (ABC:F5PS111)"
rdf:about="http://localhost/ABC/WorkItem3_4">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:subsequentWorkItem>http://localhost/ABC/WorkItem3_5</spm:subsequentWorkItem>
 <spm:workItemCode>F5PS111</spm:workItemCode>
 <spm:standardWorkItemCode>F5PS111</spm:standardWorkItemCode>
 <spm:phase>PS</spm:phase>
 <spm:category>F5</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>
```

```
<spm:WorkItem rdfs:label="System configuration and environment test (ABC:F5PT111)"
rdf:about="http://localhost/ABC/WorkItem3_5">
 <spm:subsequentWorkItem>http://localhost/ABC/WorkItem3_6</spm:subsequentWorkItem>
 <spm:workItemCode>F5PT111</spm:workItemCode>
 <spm:standardWorkItemCode>F5PT111</spm:standardWorkItemCode>
 <spm:phase>PT</spm:phase>
 <spm:category>F5</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="Investigation and analyze of failure (ABC:C1ST114)"
rdf:about="http://localhost/ABC/WorkItem3_6">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:workItemCode>C1ST114</spm:workItemCode>
 <spm:standardWorkItemCode>C1ST114</spm:standardWorkItemCode>
 <spm:phase>ST</spm:phase>
 <spm:category>C1</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:Document rdfs:label="Message list" rdf:about="http://localhost/ABC/Document1">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:outputOf>http://localhost/ABC/WorkItem3_1</spm:outputOf>
 <spm:inputOf>http://localhost/ABC/WorkItem3_6</spm:inputOf>
 <kd:path>C:\ProjectABC\Message list.xls</kd:path>
 <kd:updateDate>2010-06-07</kd:updateDate>
 <kd:createDate>2010-02-18</kd:createDate>
 <kd:creatorName>Mr. ABC</kd:creatorName>
 <kd:updaterName>Mr. ABC</kd:updaterName>
</spm:Document>

<spm:Document dc:title="System operation and maintenance design document"
rdf:about="http://localhost/ABC/Document2">
 <spm:project>http://localhost/ABC/</spm:project>
 <spm:outputOf>http://localhost/ABC/WorkItem3_2</spm:outputOf>
 <spm:inputOf>http://localhost/ABC/WorkItem3_6</spm:inputOf>
 <kd:path>C:\ProjectABC\System operation and maintenance design document.xls</kd:path>
 <kd:updateDate>2010-07-07</kd:updateDate>
 <kd:createDate>2010-03-18</kd:createDate>
 <kd:creatorName>Mr. ABC</kd:creatorName>
 <kd:updaterName>Mr. ABC</kd:updaterName>
</spm:Document>

</rdf:RDF>
```


Figure 6 — RDF representation of the process model for ProjectABC

Figure 7 shows the object instances to illustrate the registration of the process model for ProjectABC using the facilities specified in ISO/IEC 19763-5, and the associated facilities specified in ISO/IEC 11179-3 and ISO/IEC 19763-10.

<Process_Model>
Object201

Attribute/Reference	Literal/Instance
name	Project_ABC_Model
describing_language	Object202
contained_process_model_element	Object203, Object204, Object205, Object206, Object207, Object208, Object209, Object210, Object211, Object212, Object213

<Process_Modelling_Language>
Object202

Attribute/Reference	Literal/Instance
name	M-R-SPM
version	1.0
expressed_model	Object201

<Process>
Object203

Attribute/Reference	Literal/Instance
name	Business message identification (ABC:C3UI131)
containing_model	Object201
successor	Object204

<Sequence_Dependency>
Object204

Attribute/Reference	Literal/Instance
containing_model	Object201
preceding_process	Object203
following_process	Object205

<Process>
Object205

Attribute/Reference	Literal/Instance
name	Architecture design of steady operation (ABC:G1UI121)
containing_model	Object201
successor	Object206
precedent	Object204

<Sequence_Dependency>
Object206

Attribute/Reference	Literal/Instance
containing_model	Object201
preceding_process	Object205
following_process	Object207

<Process>
Object207

Attribute/Reference	Literal/Instance
name	System configuration and environment design (ABC:F5UI111)
containing_model	Object201
successor	Object208
precedent	Object206

<Sequence_Dependency>
Object208

Attribute/Reference	Literal/Instance
containing_model	Object201
preceding_process	Object207
following_process	Object209

<Process>
Object209

Attribute/Reference	Literal/Instance
name	Installation of hardware and software (ABC:F5PS111)
containing_model	Object201
successor	Object210
precedent	Object208

<Sequence_Dependency>
Object210

Attribute/Reference	Literal/Instance
containing_model	Object201
preceding_process	Object209
following_process	Object211

<Process>
Object211

Attribute/Reference	Literal/Instance
name	System configuration and environment test (ABC:F5PT111)
containing_model	Object201
successor	Object212
precedent	Object210

<Sequence_Dependency>
Object212

Attribute/Reference	Literal/Instance
containing_model	Object201
preceding_process	Object211
following_process	Object213

<Process>
Object213

Attribute/Reference	Literal/Instance
name	Investigation and analyze of failure (ABC:C1ST114)
containing_model	Object201
precedent	Object212

<Resource>
Object214

Attribute/Reference	Literal/Instance
name	Message list
containing_model	Object201
consumer	Object213
creator	Object203

<Resource>
Object215

Attribute/Reference	Literal/Instance
name	System operation and maintenance design document
containing_model	Object201
consumer	Object213
creator	Object205

Figure 7 — Object instances for the registration of the process model for ProjectABC

5.4 Step 3: Define a process model for the new project and register it using ISO/IEC 19763-5

At the start of a new project the project manager will produce a project plan that includes the processes, activities, tasks, and deliverables for the project. Now consider ProjectXYZ, a new project to re-build the existing order system so that it will be suitable for a company involved in manufacturing. The sales estimate for this project is 5 million yen and the cost estimate is 4 million yen.

Figure 8 shows a graphical representation of the process model for ProjectXYZ.

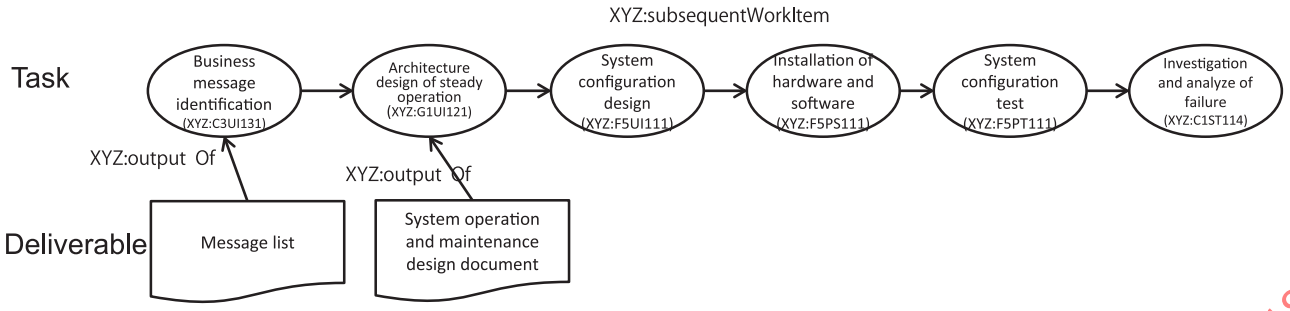

Figure 8 — Graphical representation of the process model for ProjectXYZ

Figure 9 shows the equivalent RDF description for the ProjectXYZ process model shown in Figure 8.

```
<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="Business message identification (XYZ:C3UI131)"
rdf:about="http://localhost/XYZ/WorkItem3_1">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:subsequentWorkItem>http://localhost/XYZ/WorkItem3_2</spm:subsequentWorkItem>
 <spm:workItemCode>C3UI131</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:WorkItem rdfs:label="Architecture design of steady operation (XYZ:G1UI121)"
rdf:about="http://localhost/XYZ/WorkItem3_2">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:subsequentWorkItem>http://localhost/XYZ/WorkItem3_3</spm:subsequentWorkItem>
 <spm:workItemCode>G1UI121</spm:workItemCode>
 <spm:standardWorkItemCode>G1UI121</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>G1</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="System configuration and environment design (XYZ:F5UI111)"
rdf:about="http://localhost/XYZ/WorkItem3_3">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:subsequentWorkItem>http://localhost/XYZ/WorkItem3_4</spm:subsequentWorkItem>
 <spm:workItemCode>F5UI111</spm:workItemCode>
 <spm:standardWorkItemCode>F5UI111</spm:standardWorkItemCode>
 <spm:phase>UI</spm:phase>
 <spm:category>F5</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="Installation of hardware and software (XYZ:F5PS111)"
rdf:about="http://localhost/XYZ/WorkItem3_4">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:subsequentWorkItem>http://localhost/XYZ/WorkItem3_5</spm:subsequentWorkItem>
 <spm:workItemCode>F5PS111</spm:workItemCode>
 <spm:standardWorkItemCode>F5PS111</spm:standardWorkItemCode>
 <spm:phase>PS</spm:phase>
 <spm:category>F5</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>
```

```
<spm:WorkItem rdfs:label="System configuration and environment test (XYZ:F5PT111)"
rdf:about="http://localhost/XYZ/WorkItem3_5">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:subsequentWorkItem>http://localhost/XYZ/WorkItem3_6</spm:subsequentWorkItem>
 <spm:workItemCode>F5PT111</spm:workItemCode>
 <spm:standardWorkItemCode>F5PT111</spm:standardWorkItemCode>
 <spm:phase>PT</spm:phase>
 <spm:category>F5</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:WorkItem rdfs:label="Investigation and analyze of failure (XYZ:C1ST114)"
rdf:about="http://localhost/XYZ/WorkItem3_6">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:workItemCode>C1ST114</spm:workItemCode>
 <spm:standardWorkItemCode>C1ST114</spm:standardWorkItemCode>
 <spm:phase>ST</spm:phase>
 <spm:category>C1</spm:category>
 <spm:wbsLebel>3</spm:wbsLebel>
</spm:WorkItem>

<spm:Document rdfs:label="Message list" rdf:about="http://localhost/XYZ/Document1">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:outputOf>http://localhost/XYZ/WorkItem3_1</spm:outputOf>
 <kd:path>C:\ProjectXYZ\Message list.xls</kd:path>
 <kd:updateDate>2013-06-07</kd:updateDate>
 <kd:createDate>2013-02-18</kd:createDate>
 <kd:creatorName>Mr. XYZ</kd:creatorName>
 <kd:updaterName>Mr. XYZ</kd:updaterName>
</spm:Document>

<spm:Document rdfs:label="System operation and maintenance design document"
rdf:about="http://localhost/XYZ/Document2">
 <spm:project>http://localhost/XYZ/</spm:project>
 <spm:outputOf>http://localhost/XYZ/WorkItem3_2</spm:outputOf>
 <kd:path>C:\ProjectXYZ\System operation and maintenance design document.xls</kd:path>
 <kd:updateDate>2013-07-07</kd:updateDate>
 <kd:createDate>2013-03-18</kd:createDate>
 <kd:creatorName>Mr. XYZ</kd:creatorName>
 <kd:updaterName>Mr. XYZ</kd:updaterName>
</spm:Document>

</rdf:RDF>
```

Figure 9 — RDF representation of the process model for ProjectXYZ

Figure 10 shows the object instances to illustrate the registration of the process model for ProjectXYZ using the facilities specified in ISO/IEC 19763-5, and the associated facilities specified in ISO/IEC 11179-3 and ISO/IEC 19763-10.

<Process_Model>
Object301

Attribute/Reference	Literal/Instance
name	Project_ABC_Model
describing_language	Object302
contained_process_model_element	Object303, Object304, Object305, Object306, Object307, Object308, Object309, Object310, Object311, Object312, Object313

<Process_Modelling_Language>
Object302

Attribute/Reference	Literal/Instance
name	M-R-SPM
version	1.0
expressed_model	Object301

<Process>
Object303

Attribute/Reference	Literal/Instance
name	Business message identification (XYZ:C3UI131)
containing_model	Object301
successor	Object304

<Sequence_Dependency>
Object304

Attribute/Reference	Literal/Instance
containing_model	Object301
preceding_process	Object303
following_process	Object305

<Process>
Object305

Attribute/Reference	Literal/Instance
name	Architecture design of steady operation (XYZ:G1UI121)
containing_model	Object301
successor	Object306
precedent	Object304

<Sequence_Dependency>
Object306

Attribute/Reference	Literal/Instance
containing_model	Object301
preceding_process	Object305
following_process	Object307

<Process>
Object307

Attribute/Reference	Literal/Instance
name	System configuration and environment design (XYZ:F5UI111)
containing_model	Object301
successor	Object308
precedent	Object306

<Sequence_Dependency>
Object308

Attribute/Reference	Literal/Instance
containing_model	Object301
preceding_process	Object307
following_process	Object309

<Process>
Object309

Attribute/Reference	Literal/Instance
name	Installation of hardware and software (XYZ:F5PS111)
containing_model	Object301
successor	Object310
precedent	Object308

<Sequence_Dependency>
Object310

Attribute/Reference	Literal/Instance
containing_model	Object301
preceding_process	Object309
following_process	Object311

<Process>
Object311

Attribute/Reference	Literal/Instance
name	System configuration and environment test (XYZ:F5PT111)
containing_model	Object301
successor	Object312
precedent	Object310

<Sequence_Dependency>
Object312

Attribute/Reference	Literal/Instance
containing_model	Object301
preceding_process	Object311
following_process	Object313

<Process>
Object313

Attribute/Reference	Literal/Instance
name	Investigation and analyze of failure (XYZ:C1ST114)
containing_model	Object301
precedent	Object312

<Resource>
Object314

Attribute/Reference	Literal/Instance
name	Message list
containing_model	Object301
creator	Object303

<Resource>
Object315

Attribute/Reference	Literal/Instance
name	System operation and maintenance design document
containing_model	Object301
creator	Object305

Figure 10 — Object instances for the registration of the process model for ProjectXYZ

5.5 Step 4: Define mappings between these models and register them using ISO/IEC 19763-10

Project managers do not directly adopt the Standard Process Model for each project. Instead they select, merge, and modify the processes, activities, tasks and deliverables to meet the distinctive characteristics of the new project.

For efficiency and effectiveness, the project manager may reuse the project plan of a past project with similar characteristics, only amending the plan where necessary. For example, the project manager for ProjectXYZ may reuse the project plan for ProjectABC since they are both for order systems, albeit in

different industries. Table 1 provides the mapping between the Standard Process Model, expressed using the RDF graphical representation (Figure 2), and the equivalent process model for ProjectABC, which is also expressed using the RDF graphical representation (Figure 5). Table 1 also shows the degree of the mapping – see the description of Model_Element_Set_Mapping_Degree in ISO/IEC 19763-10.

Table 1 — Mapping between the Standard Process Model and ProjectABC

Standard Process Model	Type	ProjectABC	Relation (ISO/IEC 19763-10)
Business message identification (C3UI131)	Task	Business message identification (ABC:C3UI131)	semantically_equivalent
Architecture design of steady operation (G1UI121)	Task	Architecture design of steady operation (ABC: G1UI121)	semantically_equivalent
System configuration and environment design (F5UI111)	Task	System configuration and environment design (F5UI111)	semantically_equivalent
Installation of hardware and software (F5PS111)	Task	Installation of hardware and software (ABC: F5PS111)	semantically_equivalent
System configuration and environment test (F5PT111)	Task	System configuration and environment test (ABC: F5PT111)	broader_than
Investigation and analysis of failure (C1ST114)	Task	Investigation and analysis of failure (ABC:C1ST114)	semantically_similar
System operation and maintenance design document	Deliverable	System operation and maintenance design document	semantically_similar
Message list	Deliverable	Message list	semantically_similar

Figure 11 shows the object instances for the registration of the mapping between the Standard Process Model and the process model for ProjectABC.

<Model_Mapping>
Object401

Attribute/Reference	Literal/Instance
subject_model	Object101
object_model	Object201
contains	Object405,Object415, Object425, Object435, Object445, Object455, Object465, Object475

<Model_Element_Set>
Object402

Attribute/Reference	Literal/Instance
mapped_element	Object109
mapping_from	Object405

<Model_Element_Set>
Object403

Attribute/Reference	Literal/Instance
mapped_element	Object203
mapping_to	Object405

<Model_Element_Set_Mapping_Type>
Object404

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object405

<Model_Element_Set_Mapping>
Object405

Attribute/Reference	Literal/Instance
degree	semanticarry_equivalent
contained_by	Object401
subject_set	Object402
object_set	Object403
described_by	Object404

<Model_Element_Set>
Object412

Attribute/Reference	Literal/Instance
mapped_element	Object119
mapping_from	Object415

<Model_Element_Set>
Object413

Attribute/Reference	Literal/Instance
mapped_element	Object205
mapping_to	Object415

<Model_Element_Set_Mapping_Type>
Object414

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object415

<Model_Element_Set_Mapping>
Object415

Attribute/Reference	Literal/Instance
degree	semanticarry_equivalent
contained_by	Object401
subject_set	Object412
object_set	Object413
described_by	Object414

<Model_Element_Set>
Object422

Attribute/Reference	Literal/Instance
mapped_element	Object129
mapping_from	Object425

<Model_Element_Set>
Object423

Attribute/Reference	Literal/Instance
mapped_element	Object207
mapping_to	Object425

<Model_Element_Set_Mapping_Type>
Object424

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object425

<Model_Element_Set_Mapping>
Object425

Attribute/Reference	Literal/Instance
degree	semanticarry_similar
contained_by	Object401
subject_set	Object422
object_set	Object423
described_by	Object424

<Model_Element_Set>
Object432

Attribute/Reference	Literal/Instance
mapped_element	Object149
mapping_from	Object435

<Model_Element_Set>
Object433

Attribute/Reference	Literal/Instance
mapped_element	Object209
mapping_to	Object435

<Model_Element_Set_Mapping_Type>
Object434

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object435

<Model_Element_Set_Mapping>
Object435

Attribute/Reference	Literal/Instance
degree	semanticarry_equivalen
contained_by	Object401
subject_set	Object432
object_set	Object433
described_by	Object434

<Model_Element_Set>
Object442

Attribute/Reference	Literal/Instance
mapped_element	Object159
mapping_from	Object445

<Model_Element_Set>
Object443

Attribute/Reference	Literal/Instance
mapped_element	Object211
mapping_to	Object445

<Model_Element_Set_Mapping_Type>
Object444

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object445

<Model_Element_Set_Mapping>
Object445

Attribute/Reference	Literal/Instance
degree	broader_than
contained_by	Object401
subject_set	Object442
object_set	Object443
described_by	Object444

<Model_Element_Set>
Object452

Attribute/Reference	Literal/Instance
mapped_element	Object169
mapping_from	Object455

<Model_Element_Set>
Object453

Attribute/Reference	Literal/Instance
mapped_element	Object213
mapping_to	Object455

<Model_Element_Set_Mapping_Type>
Object454

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object455

<Model_Element_Set_Mapping>
Object455

Attribute/Reference	Literal/Instance
degree	semantically_similar
contained_by	Object401
subject_set	Object452
object_set	Object453
described_by	Object454

<Model_Element_Set>
Object462

Attribute/Reference	Literal/Instance
mapped_element	Object110
mapping_from	Object465

<Model_Element_Set>
Object463

Attribute/Reference	Literal/Instance
mapped_element	Object214
mapping_to	Object465

<Model_Element_Set_Mapping_Type>
Object464

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object465

<Model_Element_Set_Mapping>
Object465

Attribute/Reference	Literal/Instance
degree	semantically_similar
contained_by	Object401
subject_set	Object462
object_set	Object463
described_by	Object464

<Model_Element_Set>
Object472

Attribute/Reference	Literal/Instance
mapped_element	Object120
mapping_from	Object475

<Model_Element_Set>
Object473

Attribute/Reference	Literal/Instance
mapped_element	Object215
mapping_to	Object475

<Model_Element_Set_Mapping_Type>
Object474

Attribute/Reference	Literal/Instance
label	M-R-SPM mapping
describes	Object475

<Model_Element_Set_Mapping>
Object475

Attribute/Reference	Literal/Instance
degree	semantically_similar
contained_by	Object401
subject_set	Object472
object_set	Object473
described_by	Object474

Figure 11 — Object instances for the registration of the mapping between the Standard Process Model and the process model for ProjectABC

Table 2 provides the mapping between the Standard Process Model, expressed using the RDF graphical representation (Figure 2), and the equivalent process model for ProjectXYZ, which is also expressed using the RDF graphical representation (Figure 8). Table 2 also shows the degree of the mapping – see the description of Model_Element_Set_Mapping_Degree in ISO/IEC 19763-10.

Table 2 — Mapping between the Standard Process Model and ProjectXYZ

Standard Process Model	Type	ProjectXYZ	Relation (ISO/IEC 19763-10)
Business message identification (C3UI131)	Task	Business message identification (XYZ:C3UI131)	semantically_equivalent
Architecture design of steady operation (G1UI121)	Task	Architecture design of steady operation (XYZ: G1UI121)	semantically_equivalent
System configuration and environment design (F5UI111)	Task	System configuration and environment design (XYZ: F5UI111)	semantically_equivalent
Installation of hardware and software (F5PS111)	Task	Installation of hardware and software (XYZ: F5PS111)	semantically_equivalent
System configuration and environment test (F5PT111)	Task	System configuration and environment test (XYZ: F5PT111)	semantically_equivalent