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Contents

1	Introduction	7
1.1	Overview	7
1.2	Purpose and recipients of the document	7
1.3	Application Domain	7
1.4	Definitions, acronyms and abbreviations	7
1.5	Document structure	7
2	General Description	9
2.1	Domain Stakeholders	9
2.2	System's Actors	10
2.3	Use Cases Model	10
2.3.1	Use Cases	10
2.3.2	Use Case Instance(s)	13
3	Environment Model	17
3.1	Environment model view(s)	17
3.2	Actors and Interfaces Descriptions	17
3.2.1	actCoordinator Actor	17
4	Concept Model	19
4.1	PrimaryTypes-Classes	19
4.1.1	Local view 04	19
4.2	PrimaryTypes-Datatypes	19
4.2.1	Local view 05	19
4.3	Concept Model Types Descriptions	20
4.3.1	Primary types - Class types descriptions	20
4.3.2	Primary types - Datatypes types descriptions	20
4.3.3	Primary types - Association types descriptions	21
4.3.4	Primary types - Aggregation types descriptions	21
4.3.5	Secondary types - Class types descriptions	21
4.3.6	Secondary types - Datatypes types descriptions	21
4.3.7	Secondary types - Association types descriptions	21
4.3.8	Secondary types - Aggregation types descriptions	21
4.3.9	Secondary types - Composition types descriptions	21
5	Operation Model	23
5.1	Environment - Out Interface Operation Scheme for actCoordinator	23
5.1.1	Operation Model for oeAddMedia	23
5.1.2	Operation Model for oeChooseMedia	23
5.1.3	Operation Model for oeCloseCrisis	24

5.1.4	Operation Model for oeRemoveMedia	25
5.1.5	Operation Model for oeSendToMedia	25
5.1.6	Operation Model for oeShareByCrisis	26
5.2	Environment - Actor Operation Schemes	26
5.3	Primary Types - Operation Schemes for Classes	26
5.4	Primary Types - Operation Schemes for Datatypes	26
5.5	Primary Types - Operation Schemes for Enumerations	26
5.6	Secondary Types - Operation Schemes for Classes	26
5.7	Secondary Types - Operation Schemes for Datatypes	26
5.8	Secondary Types - Operation Schemes for Enumerations	27
6	Test Model(s)	29
7	Additional Constraints	31
A	Undocumented Messir Specification Elements	33
A.1	Undocumented Use Cases	33
A.1.1	Undocumented Use Cases - Summary Level	33
A.1.2	Undocumented Use Cases - User-Goal Level	33
A.1.3	Undocumented Use Cases - Subfunction Level	33
A.2	Undocumented Use Case Instances	34
A.2.1	Undocumented Use Case Instances - User-Goal Level	34
A.3	Undocumented Actors	34
A.4	Undocumented Primary Types	34
A.4.1	Undocumented Primary Classe Types	34
A.4.2	Undocumented Primary Datatype Types	34
A.4.3	Undocumented Primary Enumeration Types	35
A.5	Undocumented Primary Type Relationships	35
A.5.1	Undocumented Primary Type Associations	35
A.6	Undocumented Secondary Types	35
A.6.1	Undocumented Secondary Datatype Types	35
A.7	Undocumented Operation Specifications	35
B	Messir Specification Files Listing	39
B.1	File /src-gen/messir-spec/.views.msir	39
B.2	File /src-gen/messir-spec.../environment-actCoordinator-oeAddMedia.msir	39
B.3	File /src-gen/messir-spec.../environment-actCoordinator-oeChooseMedia.msir	39
B.4	File /src-gen/messir-spec.../environment-actCoordinator-oeCloseCrisis.msir	40
B.5	File /src-gen/messir-spec.../environment-actCoordinator-oeRemoveMedia.msir	40
B.6	File /src-gen/messir-spec.../environment-actCoordinator-oeSendToMedia.msir	40
B.7	File /src-gen/messir-spec.../environment-actCoordinator-oeShareByCrisis.msir	41
B.8	File /src-gen/messir-spec/environment/environment.msir	41
B.9	File /src-gen/messir-spec/concepts.../primarytypes-associations.msir	43
B.10	File /src-gen/messir-spec/concepts/primarytypes-classes/primarytypes-classes.msir	44
B.11	File /src-gen/messir-spec/concepts.../primarytypes-datatypes.msir	46
B.12	File /src-gen/messir-spec/concepts.../secondarytypes-associations.msir	48
B.13	File /src-gen/messir-spec/concepts.../secondarytypes-classes.msir	48
B.14	File /src-gen/messir-spec/concepts.../secondarytypes-datatypes.msir	48
B.15	File /src-gen/messir-spec/tests/tests.msir	49
B.16	File /src-gen.../usecaseinstance-ugManageCrisis-uciugManageCrisis.msir	49

B.17	File /src-gen.../usecaseinstance-ugManageSharing-uciugManageSharing.ms	50
B.18	File /src-gen/messir-spec/usecases/usecases.ms	50

List of Figures

2.1	lu.uni.lassy.excalibur.icrash-spec Use Case Diagram: uc-suGlobalCrisisHandling	10
2.2	lu.uni.lassy.excalibur.icrash-spec Use Case Diagram: uc-ugManageCrisis	12
2.3	lu.uni.lassy.excalibur.icrash-spec Use Case Diagram: uc-ugManageSharing	13
2.4	lu.uni.lassy.excalibur.icrash-spec Sequence Diagram: uci-uciugManageCrisis	14
2.5	lu.uni.lassy.excalibur.icrash-spec Sequence Diagram: uci-uciugManageSharing	15
4.1	Concept Model - PrimaryTypes-Classes local view 04 - local view of the ctMedia primary cl	19
4.2	Concept Model - PrimaryTypes-Datatypes local view 05 -	19

Listings

B.1	Messir Spec. file .views.msr.	39
B.2	Messir Spec. file environment-actCoordinator-oeAddMedia.msr.	39
B.3	Messir Spec. file environment-actCoordinator-oeChooseMedia.msr.	39
B.4	Messir Spec. file environment-actCoordinator-oeCloseCrisis.msr.	40
B.5	Messir Spec. file environment-actCoordinator-oeRemoveMedia.msr.	40
B.6	Messir Spec. file environment-actCoordinator-oeSendToMedia.msr.	41
B.7	Messir Spec. file environment-actCoordinator-oeShareByCrisis.msr.	41
B.8	Messir Spec. file environment.msr.	41
B.9	Messir Spec. file primarytypes-associations.msr.	43
B.10	Messir Spec. file primarytypes-classes.msr.	44
B.11	Messir Spec. file primarytypes-datatypes.msr.	46
B.12	Messir Spec. file secondarytypes-associations.msr.	48
B.13	Messir Spec. file secondarytypes-classes.msr.	48
B.14	Messir Spec. file secondarytypes-datatypes.msr.	48
B.15	Messir Spec. file tests.msr.	49
B.16	Messir Spec. file usecaseinstance-ugManageCrisis-uciugManageCrisis.msr.	49
B.17	Messir Spec. file usecaseinstance-ugManageSharing-uciugManageSharing.msr.	50
B.18	Messir Spec. file usecases.msr.	50

Chapter 1

Introduction

1.1 Overview

1.2 Purpose and recipients of the document

1.3 Application Domain

1.4 Definitions, acronyms and abbreviations

1.5 Document structure

Chapter 2

General Description

2.1 Domain Stakeholders

2.2 System's Actors

The objective of this section is not to provide the full requirement elicitation document in this section but to reuse a part of this document to provide a informal introduction to the **Messip** specification of the system under development. The use case model is made of a use case diagrams modelling abstractly and informally the actors and their use cases together with a set of use cases descriptions. In addition, those diagrams and description tables are adapted to the **Messip** specification since actor and messages names together with parameters are partly adapted to be consistent with the specification identifiers (see [1] for more details).

2.3 Use Cases Model

This section contains the use cases elicited during the requirements elicitation phase. The use cases are textually described as suggested by the **Messip** method and inspired by the standard Cokburn template [2].

2.3.1 Use Cases

2.3.1.1 summary-suGlobalCrisisHandling

Figure 2.1 the actCoordinator's goal is to monitor the alerts received and the corresponding crisis in order to act as necessary to handle the crisis. Also to manage a list of media.

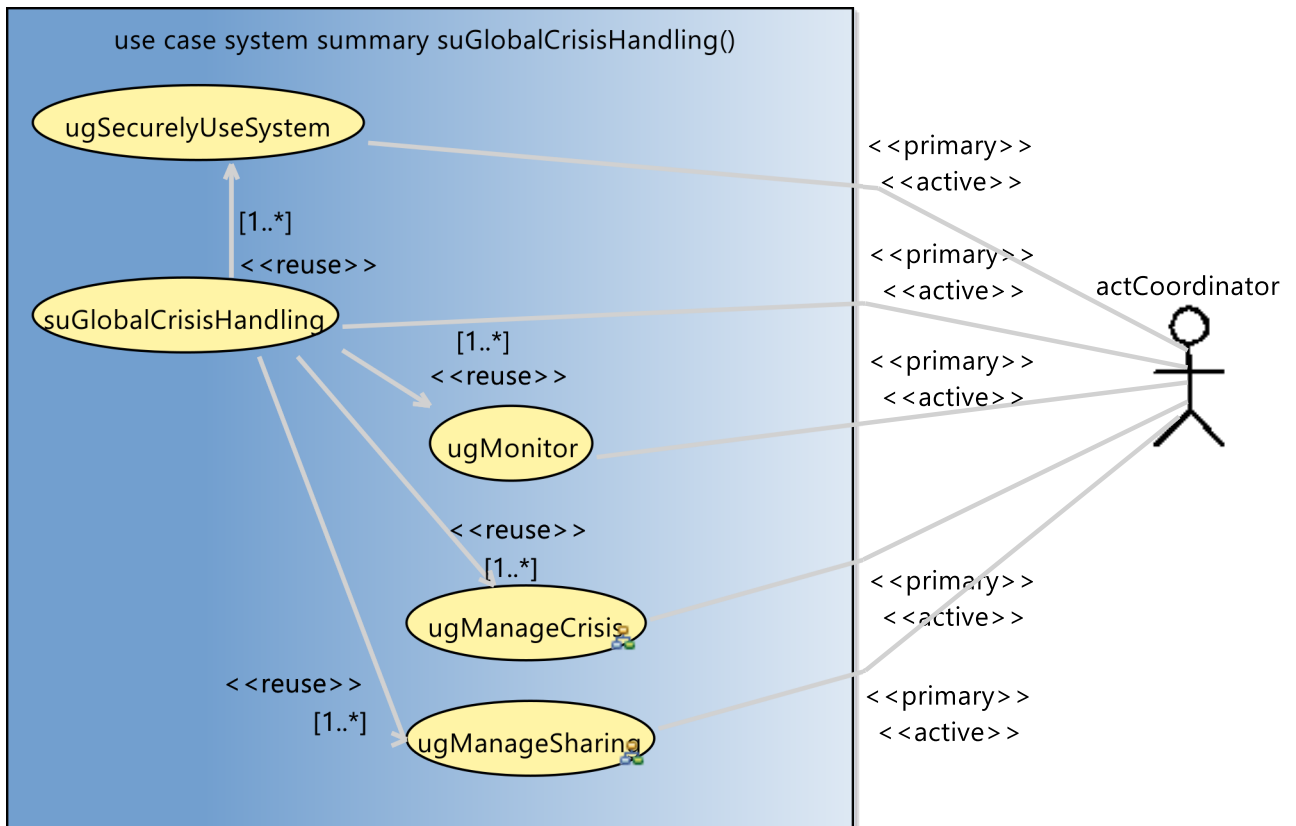


Figure 2.1:

2.3.1.2 usergoal-ugManageCrisis

Figure 2.2 The actCoordinator's goal is to get the detailed list of existing crisis or alerts to decide on next actions to undertake, for example to determine whether they are suitable to be sent to special media and send them.

2.3.1.3 usergoal-ugManageSharing

Figure 2.3 actCoordinator's goal consists in management of the list of media, namely, addition and removal of specialized media in the table

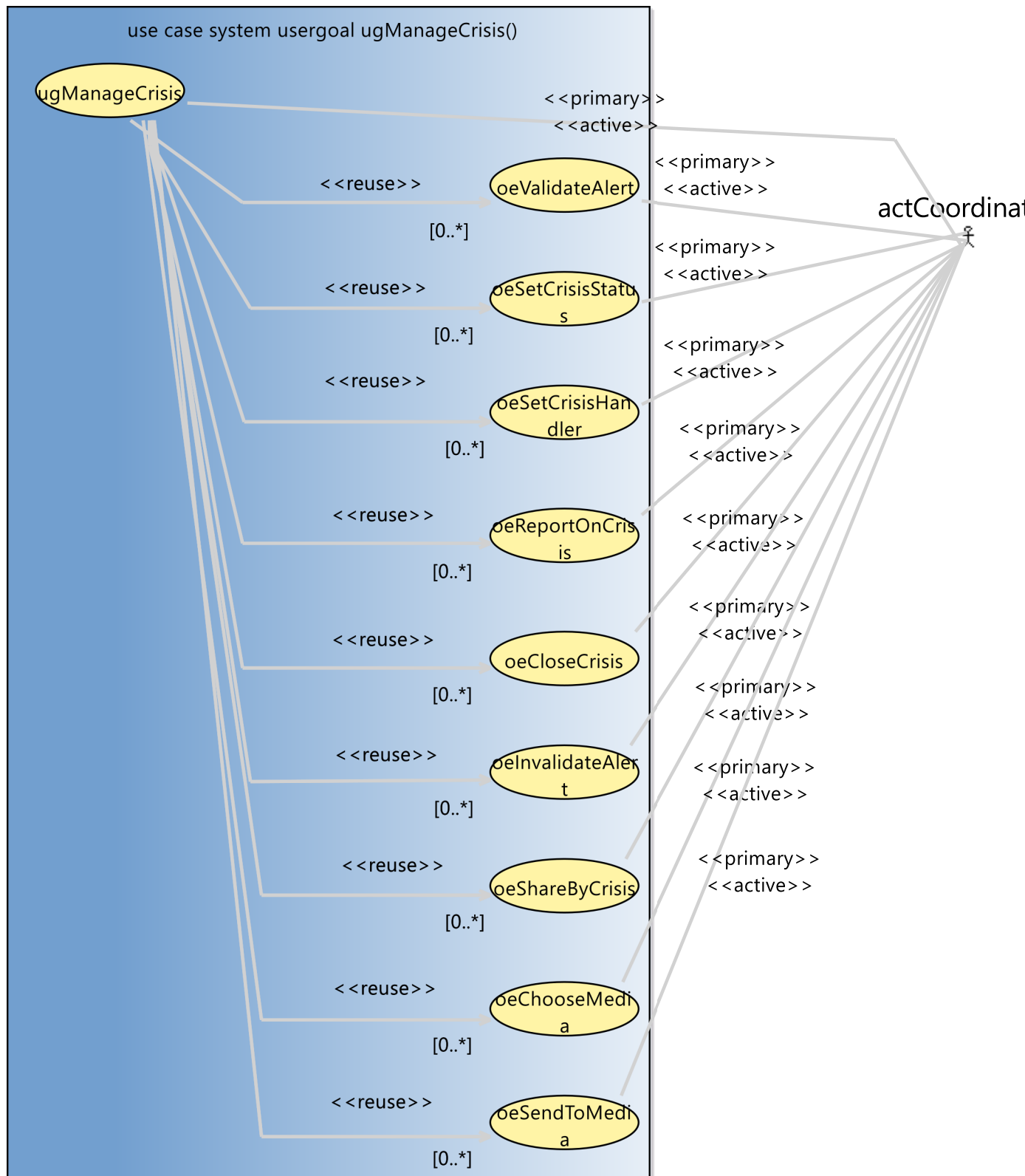


Figure 2.2:

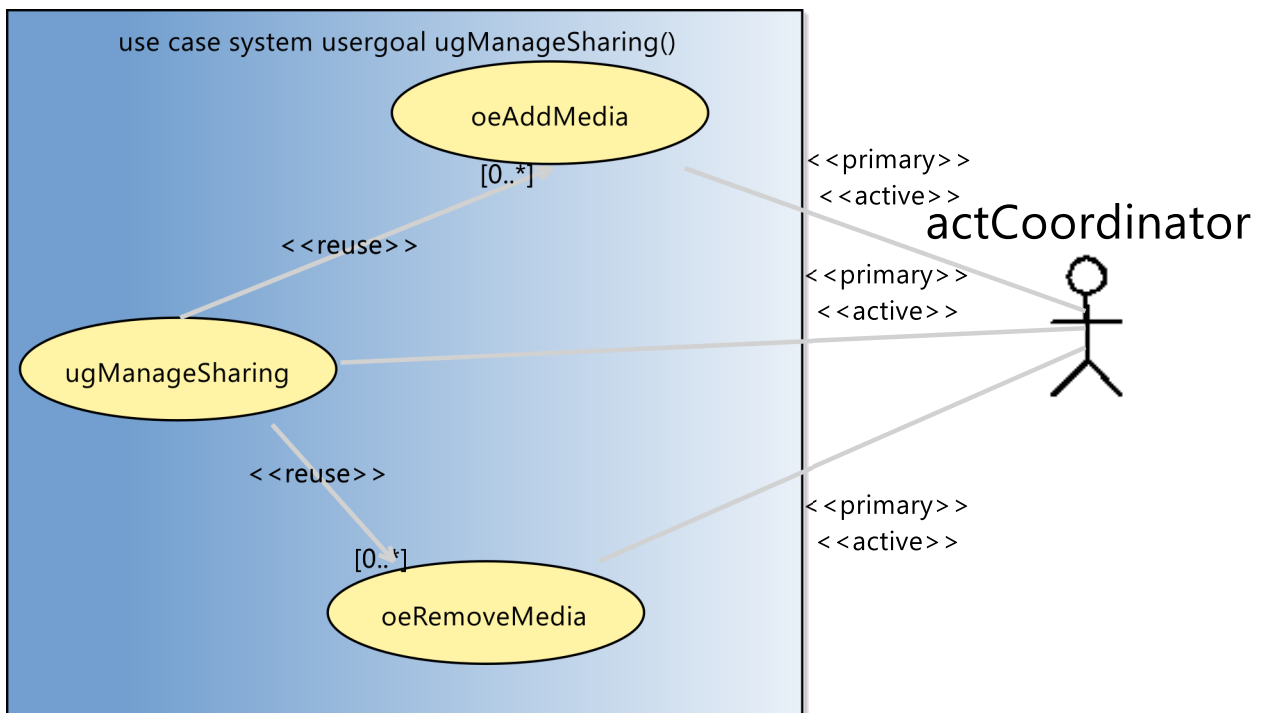


Figure 2.3:

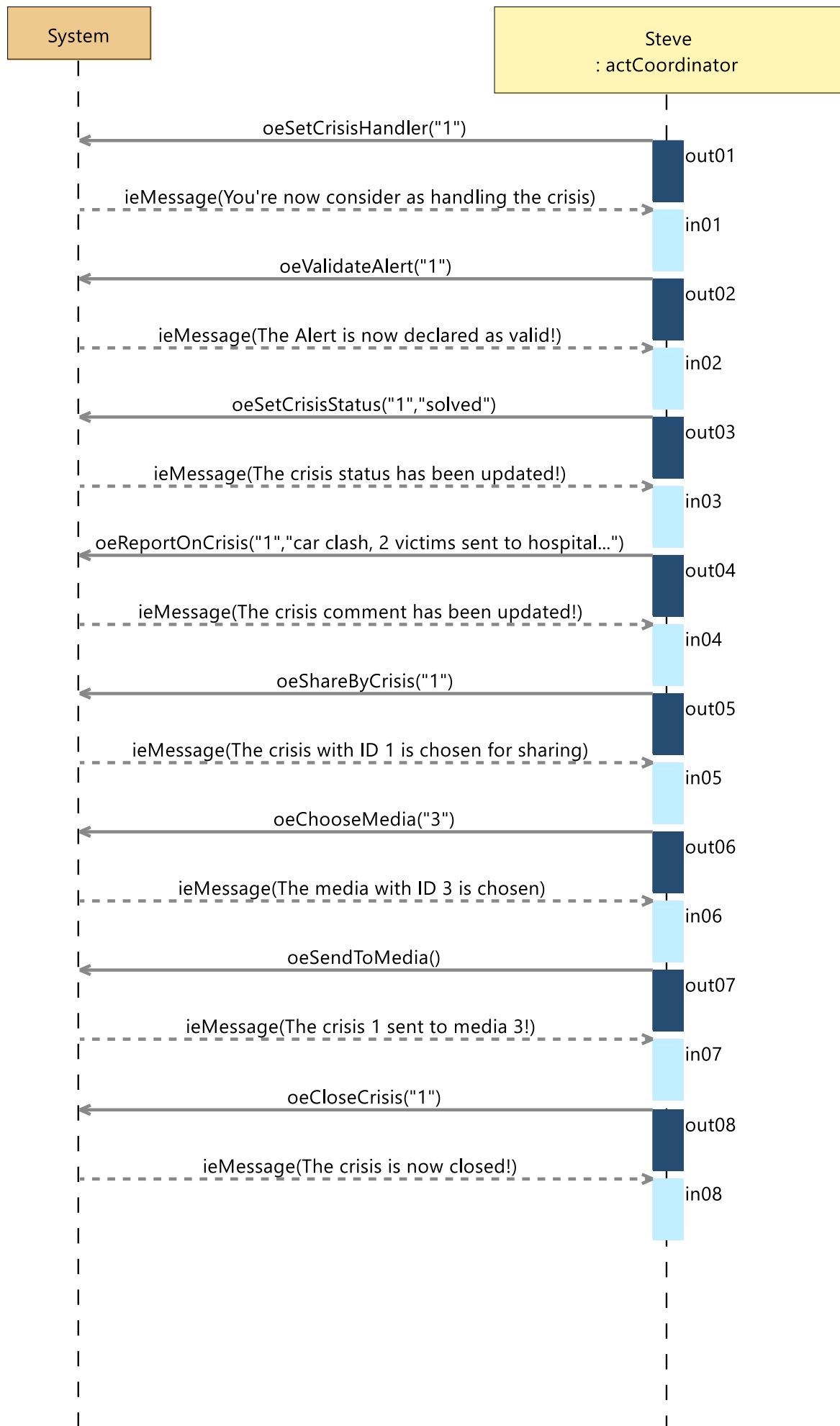
2.3.2 Use Case Instance(s)

2.3.2.1 Use-Case Instance - `uciugManageCrisis:ugManageCrisis`

Figure 2.4 Simple use case instance for the user goal `ugManageCrisis` illustrating a simple interaction scenario primarily handled by an coordinator in a concrete situation. Begins after the Coordinator got set of crises and when he sets crisis handler. he logs in the system until the full handling of all the existing crisis. After handling of crisis Coordinator determines a category of crisis and marks it for sharing with specific media

2.3.2.2 Use-Case Instance - `uciugManageSharing:ugManageSharing`

Figure 2.5 use case instance for the user goal `ugManageSharing` illustrates a simple example of scenario handled by an coordinator for management of the list of media in a concrete situation.



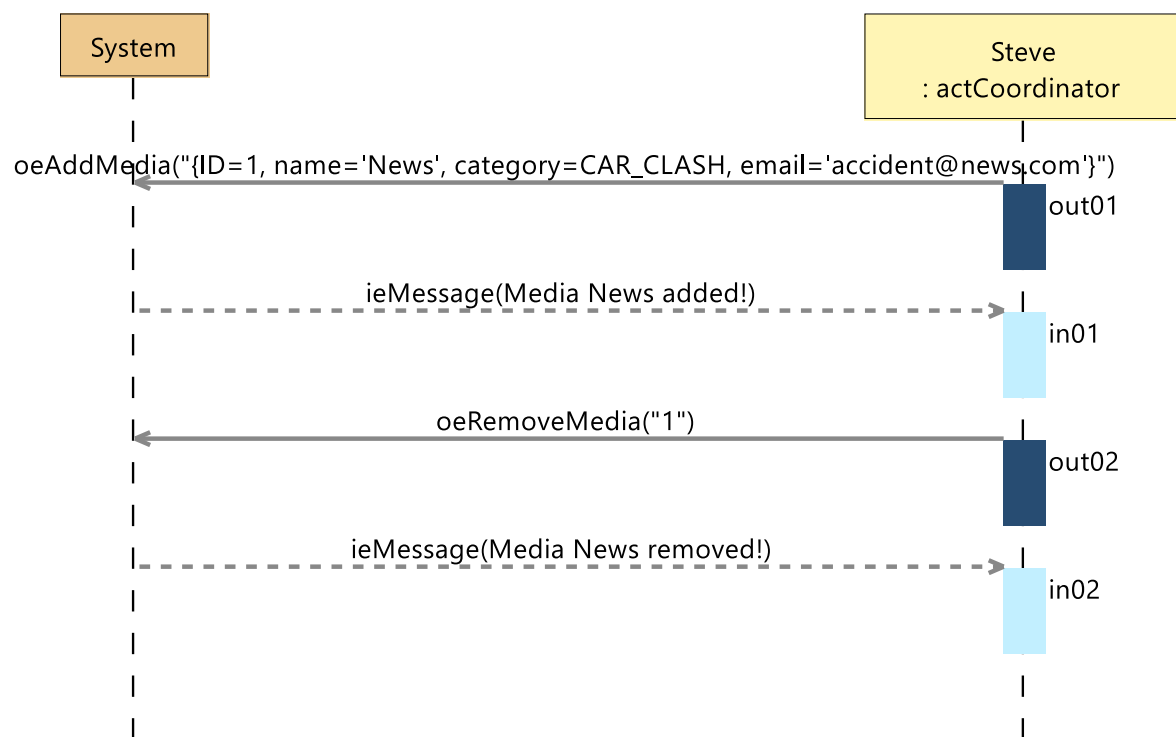


Figure 2.5:

Chapter 3

Environment Model

3.1 Environment model view(s)

There are no view(s) for the **Messip** environment model.

3.2 Actors and Interfaces Descriptions

We provide for the given views the description of the actors together with their associated input and output interface descriptions.

3.2.1 actCoordinator Actor

ACTOR	
actCoordinator	
represents actor responsible of handling one or several crisis for the <i>iCrash</i> system.	
Extends	
lu.uni.lassy.excalibur.icrash.spec.environment.actAuthenticated	
OutputInterfaces	
OUT 1	oeInvalidateAlert(AdtAlertID:dtAlertID):ptBoolean sent to indicate that an alert should be considered as closed.
OUT 2	oeCloseCrisis(AdtCrisisID:dtCrisisID):ptBoolean sent to indicate that a crisis should be considered as closed.
OUT 3	oeGetAlertsSet(AetAlertStatus:etAlertStatus):ptBoolean sent to request all the ctAlert instances having a specific status.
OUT 4	oeGetCrisisSet(AetCrisisStatus:etCrisisStatus):ptBoolean sent to request all the ctCrisis instances having a specific status.
OUT 5	oeSetCrisisHandler(AdtCrisisID:dtCrisisID):ptBoolean sent to declare himself as been the handler of a crisis having the specified id.
OUT 6	oeReportOnCrisis(AdtCrisisID:dtCrisisID, AdtComment:dtComment):ptBoolean sent to update the textual information available for a specific handled crisis.
OUT 7	oeSetCrisisStatus(AdtCrisisID:dtCrisisID, AetCrisisStatus:etCrisisStatus):ptBoolean sent to define the handling status of a specific crisis.
OUT 8	oeSetCrisisType(AdtCrisisID:dtCrisisID, AetCrisisType:etCrisisType):ptBoolean sent to define the gravity type of a specific crisis.
OUT 9	oeValidateAlert(AdtAlertID:dtAlertID):ptBoolean

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... Actor table continuation

	sent to indicate that a specific alert is not a fake.
OUT 10	oeAddMedia(ActMedia:ctMedia):ptBoolean sent to indicate that a new media were added.
OUT 11	oeRemoveMedia(AdtMediaID:dtMediaID):ptBoolean sent to indicate that specific media were removed.
OUT 12	oeShareByCrisis(AdtCrisisID:dtCrisisID):ptBoolean sent to indicate that crises were chosen to share.
OUT 13	oeChooseMedia(AdtMediaID:dtMediaID):ptBoolean sent to indicate that specific media were chosen to share.
OUT 14	oeSendToMedia():ptBoolean sent to indicate that crises descriptions were sent to media.
<i>InputInterfaces</i>	
IN 1	ieSendAnAlert(ActAlert:ctAlert):ptBoolean allows for receiving a requested ctAlert instance.
IN 2	ieSendACrisis(ActCrisis:ctCrisis):ptBoolean allows for receiving a requested ctCrisis instance.

Chapter 4

Concept Model

4.1 PrimaryTypes-Classes

4.1.1 Local view 04

Figure 4.1 shows the local view of the ctMedia primary class type.

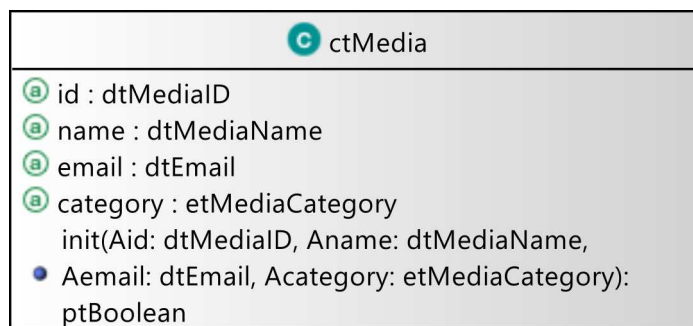


Figure 4.1: Concept Model - PrimaryTypes-Classes local view 04. local view of the ctMedia primary class type.

4.2 PrimaryTypes-Datatypes

4.2.1 Local view 05

Figure 4.2 used to determine which category of media waits specific crisis description

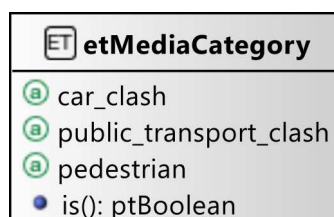


Figure 4.2: Concept Model - PrimaryTypes-Datatypes local view 05. .

4.3 Concept Model Types Descriptions

This section provides the textual descriptions of all the types defined in the concept model and that can be part of the graphical views provided.

4.3.1 Primary types - Class types descriptions

The table below is providing comments on the graphical views given for the class types of the primary types. Type logical operations are precisely specified in the operation model.

CLASSES	
<i>ctMedia</i>	
determine instance of specific media	
attribute	category: etMediaCategory
attribute	email: dtEmail
attribute	id: dtMediaID
attribute	name: dtMediaName
operation	init(Aid:dtMediaID, Aname:dtMediaName, Aemail:dtEmail, Acategory:etMediaCategory):ptBoolean

4.3.2 Primary types - Datatypes types descriptions

The table below is providing comments on the graphical views given for the datatype types of the primary types.

DATATYPES	
<i>dtEmail</i>	
primary data type for email of specific media	
<i>extends</i>	dtString
operation	is():ptBoolean
<i>dtMediaID</i>	
primary data type for media id	
<i>extends</i>	dtString
operation	is():ptBoolean
<i>dtMediaName</i>	
primary data type for media name	
<i>extends</i>	dtString
operation	is():ptBoolean

ENUMERATIONS

continues in next page ...

...Enumerations table continuation

<i>etMediaCategory</i> used to determine which category of media waits specific crisis description.	
operation	is():ptBoolean

4.3.3 Primary types - Association types descriptions

There are no association types for the primary types.

4.3.4 Primary types - Aggregation types descriptions

There are no aggregation types for the primary types.

4.3.4.1 Primary types - Composition types descriptions

There are no composition types for the primary types.

4.3.5 Secondary types - Class types descriptions

There are no elements in this category in the system analysed.

4.3.6 Secondary types - Datatypes types descriptions

There are no elements in this category in the system analysed.

4.3.7 Secondary types - Association types descriptions

There are no association types for the secondary types.

4.3.8 Secondary types - Aggregation types descriptions

There are no aggregation types for the secondary types.

4.3.9 Secondary types - Composition types descriptions

There are no composition types for the secondary types.

Chapter 5

Operation Model

This section contains the operation schemes of each operation defined in either an actor, its output interface, in a primary or secondary type (class, datatype or enumeration types). The **Messip** OCL code listing is joined to the comment table.

5.1 Environment - Out Interface Operation Scheme for actCoordinator

5.1.1 Operation Model for oeAddMedia

The oeAddMedia operation has the following properties:

OPERATION	
oeAddMedia adding to common list of media	
Parameters	
1	ActMedia: ctMedia instance of media for adding to common list
Return type	
ptBoolean	
Pre-Condition (protocol)	
PreP 1	the system is started
PreP 2	the actor logged previously and did not log out ! (i.e. the associated ctCoordinator instance is considered logged)
Pre-Condition (functional)	
PreF 1	none
Post-Condition (functional)	
PostF 1	actCoordinator is informed about the finished adding operation
Post-Condition (protocol)	
PostP 1	none

5.1.2 Operation Model for oeChooseMedia

The oeChooseMedia operation has the following properties:

OPERATION	
<i>oeChooseMedia</i>	
selection of the specific media from the list to share with them	
<i>Parameters</i>	
1	AdtMediaID: dtMediaID chosen media id
<i>Return type</i>	
ptBoolean	
<i>Pre-Condition (protocol)</i>	
PreP 1	the system is started
PreP 2	the actor logged previously and did not log out ! (i.e. the associated ctCoordinator instance is considered logged)
<i>Pre-Condition (functional)</i>	
PreF 1	it is supposed that there exist at least one of the media with the appropriate category in the list
PreF 2	it assumes that you have selected the appropriate crisis
<i>Post-Condition (functional)</i>	
PostF 1	actCoordinator is informed about the choosing media
<i>Post-Condition (protocol)</i>	
PostP 1	none

5.1.3 Operation Model for oeCloseCrisis

The `oeCloseCrisis` operation has the following properties:

OPERATION	
<i>oeCloseCrisis</i>	
sent to indicate that a crisis should be considered as closed.	
<i>Parameters</i>	
1	AdtCrisisID: dtCrisisID the identification information used to determine the crisis to close
<i>Return type</i>	
ptBoolean	
<i>Pre-Condition (protocol)</i>	
PreP 1	the system is started
PreP 2	the actor logged previously and did not log out ! (i.e. the associated ctCoordinator instance is considered logged)
<i>Pre-Condition (functional)</i>	
PreF 1	it is supposed that there exist one ctCrisis instance with the same <code>id</code> attribute value as the one provided by the coordinator actor who wants to close.
<i>Post-Condition (functional)</i>	
PostF 1	the ctCrisis class instance having the provided id is considered closed in the post state.
PostF 2	There is no handler declared in the system as associated to the crisis.
PostF 3	all the alert instances associated to this crisis do not belong any more to the system's post state.
PostF 4	the coordinator actor is informed about the satisfaction of its request.
<i>Post-Condition (protocol)</i>	

continues in next page ...

... Operation table continuation

PostP 1	none
---------	------

5.1.4 Operation Model for oeRemoveMedia

The oeRemoveMedia operation has the following properties:

OPERATION	
oeRemoveMedia	
removing media from the common list	
Parameters	
1	AdtMediaID: dtMediaID remove the media from passed media id
Return type	
ptBoolean	
Pre-Condition (protocol)	
PreP 1	the system is started
PreP 2	the actor logged previously and did not log out ! (i.e. the associated ctCoordinator instance is considered logged)
Pre-Condition (functional)	
PreF 1	it is supposed that there exist at least one media in the list
Post-Condition (functional)	
PostF 1	actCoordinator is informed about the finished removing operation
Post-Condition (protocol)	
PostP 1	none

5.1.5 Operation Model for oeSendToMedia

The oeSendToMedia operation has the following properties:

OPERATION	
oeSendToMedia	
sent information about chosen crises to selected media	
Return type	
ptBoolean	
Pre-Condition (protocol)	
PreP 1	the system is started
PreP 2	the actor logged previously and did not log out ! (i.e. the associated ctCoordinator instance is considered logged)
Pre-Condition (functional)	
PreF 1	it is supposed that there exist at least one of the media with the appropriate category in the list
PreF 2	it assumes that have already been selected crises and the corresponding media
Post-Condition (functional)	
PostF 1	actCoordinator is informed about the sending information about crises
Post-Condition (protocol)	
PostP 1	none

5.1.6 Operation Model for oeShareByCrisis

The `oeShareByCrisis` operation has the following properties:

OPERATION	
<i>oeShareByCrisis</i> sent to indicate that crisis was chosen to share.	
<i>Parameters</i>	
1	AdtCrisisID: dtCrisisID marked crisis id (may list)
<i>Return type</i>	
ptBoolean	
<i>Pre-Condition (protocol)</i>	
PreP 1	the system is started
PreP 2	the actor logged previously and did not log out ! (i.e. the associated ctCoordinator instance is considered logged)
<i>Pre-Condition (functional)</i>	
PreF 1	it is supposed that there exist at least one of the media with the appropriate category in the list
<i>Post-Condition (functional)</i>	
PostF 1	actCoordinator is informed about the chosen crises for sharing
<i>Post-Condition (protocol)</i>	
PostP 1	none

5.2 Environment - Actor Operation Schemes

There are no elements in this category in the system analysed.

5.3 Primary Types - Operation Schemes for Classes

There are no elements in this category in the system analysed.

5.4 Primary Types - Operation Schemes for Datatypes

There are no elements in this category in the system analysed.

5.5 Primary Types - Operation Schemes for Enumerations

There are no elements in this category in the system analysed.

5.6 Secondary Types - Operation Schemes for Classes

There are no elements in this category in the system analysed.

5.7 Secondary Types - Operation Schemes for Datatypes

There are no elements in this category in the system analysed.

5.8 Secondary Types - Operation Schemes for Enumerations

There are no elements in this category in the system analysed.

Chapter 6

Test Model(s)

There are no elements in this category in the system analysed.

Chapter 7

Additional Constraints

Appendix A

Undocumented Messir Specification Elements

A.1 Undocumented Use Cases

A.1.1 Undocumented Summary Level Use Cases

- `lu.uni.lassy.excalibur.icrash.spec.usecases.suGlobalCrisisHandling`

A.1.2 Undocumented User-Goal Level Use Cases

- `lu.uni.lassy.excalibur.icrash.spec.usecases.ugManageCrisis`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.ugManageSharing`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.ugMonitor`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.ugSecurelyUseSystem`

A.1.3 Undocumented Subfunction Level Use Cases

- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeAddMedia`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeChooseMedia`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeCloseCrisis`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeGetAlertsSet`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeGetCrisisSet`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeInvalidateAlert`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeRemoveMedia`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeReportOnCrisis`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeSendToMedia`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeSetCrisisHandler`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeSetCrisisStatus`

- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeShareByCrisis`
- `lu.uni.lassy.excalibur.icrash.spec.usecases.oeValidateAlert`

A.2 Undocumented Use Case Instances

A.2.1 Undocumented User-Goal Level Use Case Instances

- `usecases.uciugManageSharing.uciugManageSharing`
- `usecases.uciugManageCrisis.uciugManageCrisis`

A.3 Undocumented Actors

- `lu.uni.lassy.excalibur.icrash.spec.environment.actActivator`
- `lu.uni.lassy.excalibur.icrash.spec.environment.actAdministrator`
- `lu.uni.lassy.excalibur.icrash.spec.environment.actAuthenticated`
- `lu.uni.lassy.excalibur.icrash.spec.environment.actComCompany`
- `lu.uni.lassy.excalibur.icrash.spec.environment.actMsrCreator`

A.4 Undocumented Primary Types

A.4.1 Undocumented Primary Classe Types

- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctAdministrator`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctAlert`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctAuthenticated`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctCoordinator`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctCrisis`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctHuman`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctState`

A.4.2 Undocumented Primary Datatype Types

- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtAlertID`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtComment`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtCoordinatorID`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtCrisisID`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtGPSLocation`
- `lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtLatitude`

- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtLogin
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtLongitude
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtPassword
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtPhoneNumber

A.4.3 Undocumented Primary Enumeration Types

- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etAlertStatus
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etCrisisStatus
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etCrisisType
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etHumanKind

A.5 Undocumented Primary Relationships

A.5.1 Undocumented Primary Type Associations

- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations.assctAlertctCrisis
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations.assctAlertctHuman
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations.assctAuthenticatedactAuthenticated
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations.assctCoordinatoractCoordinator
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations.assctCrisisctCoordinator
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations.assctHumanactComCompany

A.6 Undocumented Secondary Types

A.6.1 Undocumented Secondary Datatype Types

- lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.datatypes.dtSMS

A.7 Undocumented Operation Specifications

- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctAlert.isSentToCoordinator
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctCrisis.handlingDelayPassed
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctCrisis.isAllocatedIfPossible
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctCrisis.isSentToCoordinator
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctCrisis.maxHandlingDelayPassed
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes.ctHuman.isAcknowledged
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtAlertID.is

- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtComment.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtCoordinatorID.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtCrisisID.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtEmail.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtGPSLocation.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtGPSLocation.isNearTo
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtLatitude.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtLogin.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtLongitude.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtMediaID.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtMediaName.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtPassword.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.dtPhoneNumber.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etAlertStatus.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etCrisisStatus.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etCrisisType.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etHumanKind.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes.etMediaCategory.is
- lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.datatypes.dtSMS.is
- lu.uni.lassy.excalibur.icrash.spec.environment.actActivator.outactActivator.oeSetClock
- lu.uni.lassy.excalibur.icrash.spec.environment.actActivator.outactActivator.oeSolicitCrisisHandling
- lu.uni.lassy.excalibur.icrash.spec.environment.actAdministrator.outactAdministrator.oeAddCoordinator
- lu.uni.lassy.excalibur.icrash.spec.environment.actAdministrator.outactAdministrator.oeDeleteCoordinator
- lu.uni.lassy.excalibur.icrash.spec.environment.actAuthenticated.outactAuthenticated.oeLogin
- lu.uni.lassy.excalibur.icrash.spec.environment.actAuthenticated.outactAuthenticated.oeLogout
- lu.uni.lassy.excalibur.icrash.spec.environment.actComCompany.outactComCompany.oeAlert
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeGetAlertsSet
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeGetCrisisSet
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeInvalidateAlert
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeReportOnCrisis

- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeSetCrisisHandler
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeSetCrisisStatus
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeSetCrisisType
- lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.oeValidateAlert
- lu.uni.lassy.excalibur.icrash.spec.environment.actMsrCreator.outactMsrCreator.oeCreateSystemAndEnvironm

Appendix B

Messir Specification Files Listing

B.1 File ./src-gen/messir-spec/.views.msr

```
1 //
2 //DON'T TOUCH THIS FILE !!!
3 //
4 package uuid6972196d7b104531a20b45e09943cd53 {
5   Concept Model {}
6 }
```

Listing B.1: Messir Spec. file .views.msr.

B.2 File ./src-gen/messir-spec/operations/environment/environment-actCoordinator-oeAddMedia.msr

```
1 package lu.uni.lassy.excalibur.icrash.spec.environment.operations.actCoordinator.outactCoordinator.
   oeAddMedia {
2
3   import lu.uni.lassy.messir.libraries.primitives
4   import lu.uni.lassy.messir.libraries.math
5   import lu.uni.lassy.messir.libraries.string
6   import lu.uni.lassy.messir.libraries.calendar
7   import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes
8
9   Operation Model {
10
11   operation: lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.
       oeAddMedia(ActMedia:ctMedia):ptBoolean{
12   // include below the specification information (pre,post or ocl or prolog)
13
14   }
15 }
16 }
```

Listing B.2: Messir Spec. file environment-actCoordinator-oeAddMedia.msr.

B.3 File ./src-gen/messir-spec/operations/environment/environment-actCoordinator-oeChooseMedia.msr

```
1 package lu.uni.lassy.excalibur.icrash.spec.environment.operations.actCoordinator.outactCoordinator.
   oeChooseMedia {
2
3   import lu.uni.lassy.messir.libraries.primitives
4   import lu.uni.lassy.messir.libraries.math
5   import lu.uni.lassy.messir.libraries.string
6   import lu.uni.lassy.messir.libraries.calendar
7   import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
```

```

8
9 Operation Model {
10
11 operation: lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.
    oeChooseMedia(AdtMediaID:dtMediaID):ptBoolean{
12 // include below the specification information (pre,post or ocl or prolog)
13
14 }
15 }
16 }

```

Listing B.3: Messir Spec. file environment-actCoordinator-oeChooseMedia.msr.

B.4 File ./src-gen/messir-spec/operations/environment/environment-actCoordinator-oeCloseCrisis.msr

```

1 package lu.uni.lassy.excalibur.icrash.spec.environment.operations.actCoordinator.outactCoordinator.
    oeCloseCrisis {
2
3 import lu.uni.lassy.messir.libraries.primitives
4 import lu.uni.lassy.messir.libraries.math
5 import lu.uni.lassy.messir.libraries.string
6 import lu.uni.lassy.messir.libraries.calendar
7 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
8
9 Operation Model {
10
11 operation: lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.
    oeCloseCrisis(AdtCrisisID:dtCrisisID):ptBoolean{
12 // include below the specification information (pre,post or ocl or prolog)
13
14 }
15 }
16 }

```

Listing B.4: Messir Spec. file environment-actCoordinator-oeCloseCrisis.msr.

B.5 File ./src-gen/messir-spec/operations/environment/environment-actCoordinator-oeRemoveMedia.msr

```

1 package lu.uni.lassy.excalibur.icrash.spec.environment.operations.actCoordinator.outactCoordinator.
    oeRemoveMedia {
2
3 import lu.uni.lassy.messir.libraries.primitives
4 import lu.uni.lassy.messir.libraries.math
5 import lu.uni.lassy.messir.libraries.string
6 import lu.uni.lassy.messir.libraries.calendar
7 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
8
9 Operation Model {
10
11 operation: lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.
    oeRemoveMedia(AdtMediaID:dtMediaID):ptBoolean{
12 // include below the specification information (pre,post or ocl or prolog)
13
14 }
15 }
16 }

```

Listing B.5: Messir Spec. file environment-actCoordinator-oeRemoveMedia.msr.

B.6 File ./src-gen/messir-spec/operations/environment/environment-actCoordinator-oeSendToMedia.msr

B.7. FILE /SRC-GEN/MESSIR-SPEC.../ENVIRONMENT-ACTCOORDINATOR-OESHAREBYCRISIS.MSR41

```
1 package lu.uni.lassy.excalibur.icrash.spec.environment.operations.actCoordinator.outactCoordinator.
   oeSendToMedia {
2
3 import lu.uni.lassy.messir.libraries.primitives
4 import lu.uni.lassy.messir.libraries.math
5 import lu.uni.lassy.messir.libraries.string
6 import lu.uni.lassy.messir.libraries.calendar
7
8 Operation Model {
9
10 operation: lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.
   oeSendToMedia():ptBoolean{
11 // include below the specification information (pre,post or ocl or prolog)
12
13 }
14 }
15 }
```

Listing B.6: Messir Spec. file environment-actCoordinator-oeSendToMedia.msr.

B.7 File ./src-gen/messir-spec/operations/environment/environment-actCoordinator-oeShareByCrisis.msr

```
1 package lu.uni.lassy.excalibur.icrash.spec.environment.operations.actCoordinator.outactCoordinator.
   oeShareByCrisis {
2
3 import lu.uni.lassy.messir.libraries.primitives
4 import lu.uni.lassy.messir.libraries.math
5 import lu.uni.lassy.messir.libraries.string
6 import lu.uni.lassy.messir.libraries.calendar
7 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
8
9 Operation Model {
10
11 operation: lu.uni.lassy.excalibur.icrash.spec.environment.actCoordinator.outactCoordinator.
   oeShareByCrisis(AdtCrisisID:dtCrisisID):ptBoolean{
12 // include below the specification information (pre,post or ocl or prolog)
13
14 }
15 }
16 }
```

Listing B.7: Messir Spec. file environment-actCoordinator-oeShareByCrisis.msr.

B.8 File ./src-gen/messir-spec/environment/environment.msr

```
1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:39 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.environment {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.math
10 import lu.uni.lassy.messir.libraries.primitives
11 import lu.uni.lassy.messir.libraries.string
12 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations
13 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes
14 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
15 import lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.datatypes
16
17 Environment Model {
18
19 actor actMsrCreator role rnactMsrCreator cardinality [1..1] {
20
21 operation init():ptBoolean
```

```

22
23   input interface inactMsrCreator {
24   }
25   output interface outactMsrCreator {
26       operation oeCreateSystemAndEnvironment(AqtyComCompanies:ptInteger ):ptBoolean
27   }
28   }
29
30   actor actAdministrator
31       role rnactAdministrator
32       cardinality [1..1]
33       extends actAuthenticated {
34
35       operation init():ptBoolean
36
37       output interface outactAdministrator{
38
39           operation oeAddCoordinator(
40               AdtCoordinatorID:dtCoordinatorID ,
41               AdtLogin:dtLogin ,
42               AdtPassword:dtPassword ):ptBoolean
43
44           operation oeDeleteCoordinator(
45               AdtCoordinatorID:dtCoordinatorID ):ptBoolean
46       }
47
48       input interface inactAdministrator{
49
50           operation ieCoordinatorAdded():ptBoolean
51           operation ieCoordinatorDeleted():ptBoolean
52       }
53   }
54
55   actor actCoordinator
56       role rnactCoordinator
57       cardinality [0..*]
58       extends actAuthenticated{
59
60       operation init():ptBoolean
61
62       output interface outactCoordinator{
63           operation oeInvalidateAlert(AdtAlertID:dtAlertID ):ptBoolean
64           operation oeCloseCrisis(AdtCrisisID:dtCrisisID ):ptBoolean
65           operation oeGetAlertsSet(AetAlertStatus:etAlertStatus ):ptBoolean
66           operation oeGetCrisisSet(AetCrisisStatus:etCrisisStatus ):ptBoolean
67           operation oeSetCrisisHandler(AdtCrisisID:dtCrisisID ):ptBoolean
68           operation oeReportOnCrisis(
69               AdtCrisisID:dtCrisisID ,
70               AdtComment:dtComment
71           ):ptBoolean
72           operation oeSetCrisisStatus(
73               AdtCrisisID:dtCrisisID ,
74               AetCrisisStatus:etCrisisStatus
75           ):ptBoolean
76           operation oeSetCrisisType(
77               AdtCrisisID:dtCrisisID ,
78               AetCrisisType:etCrisisType
79           ):ptBoolean
80           operation oeValidateAlert(AdtAlertID:dtAlertID ):ptBoolean
81
82           operation oeAddMedia(ActMedia:ctMedia):ptBoolean
83           operation oeRemoveMedia(AdtMediaID:dtMediaID):ptBoolean
84           operation oeShareByCrisis(AdtCrisisID:dtCrisisID):ptBoolean
85           operation oeChooseMedia(AdtMediaID:dtMediaID):ptBoolean
86           operation oeSendToMedia():ptBoolean
87       }
88
89       input interface inactCoordinator{
90           operation ieSendAnAlert(ActAlert:ctAlert ):ptBoolean
91           operation ieSendACrisis(ActCrisis:ctCrisis ):ptBoolean

```

```

92     }
93 }
94
95 actor actComCompany role rnactComCompany cardinality [0..*]{
96     operation init():ptBoolean
97
98     output interface outactComCompany{
99         operation oeAlert(
100             AetHumanKind:etHumanKind ,
101             AdtDate:dtDate ,
102             AdtTime:dtTime ,
103             AdtPhoneNumber:dtPhoneNumber ,
104             AdtGPSLocation:dtGPSLocation ,
105             AdtComment:dtComment
106         ):ptBoolean
107     }
108 }
109
110 input interface inactComCompany{
111     operation ieSmsSend(AdtPhoneNumber:dtPhoneNumber ,
112         AdtSMS:dtSMS
113     ):ptBoolean
114 }
115 }
116
117 actor actAuthenticated role rnactAuthenticated cardinality [0..*]{
118
119     operation init():ptBoolean
120
121     output interface outactAuthenticated{
122         operation oeLogin(AdtLogin:dtLogin , AdtPassword:dtPassword ):ptBoolean
123         operation oeLogout():ptBoolean
124     }
125
126     input interface inactAuthenticated{
127         operation ieMessage(AMessage:ptString):ptBoolean
128     }
129 }
130
131 actor actActivator[proactive] role rnactActivator cardinality [1..1]{
132
133     operation init():ptBoolean
134
135     output interface outactActivator{
136         proactive operation oeSollicitateCrisisHandling():ptBoolean
137         proactive operation oeSetClock(AcurrentClock:dtDateAndTime ):ptBoolean
138     }
139
140     input interface inactActivator{
141     }
142 }
143 }
144 }

```

Listing B.8: Messir Spec. file environment.msr.

B.9 File `./src-gen/messir-spec/concepts/primarytypes-associations/primarytypes-associations.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:38 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.math

```

```

10 import lu.uni.lassy.messir.libraries.primitives
11 import lu.uni.lassy.messir.libraries.string
12 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes
13 import lu.uni.lassy.excalibur.icrash.spec.environment
14
15 Concept Model {
16
17   Primary Types{
18
19 // Internal
20
21 association assctAlertctCrisis
22   ctAlert(rnAlerts)[1..*]
23   ctCrisis (rnTheCrisis)[1..1]
24
25 association assctAlertctHuman
26   ctAlert(rnSignaled)[1..*]
27   ctHuman (rnSignaler)[1..1]
28
29 association assctCrisisctCoordinator
30   ctCrisis(rnHandled)[0..*]
31   ctCoordinator(rnHandler)[0..1]
32
33 // With Actors
34
35   association assctHumanactComCompany
36     ctHuman(rnctHuman)[0..*]
37     actComCompany(rnactComCompany)[1..1]
38
39   association assctCoordinatoractCoordinator
40     ctCoordinator(rnctCoordinator)[1..1]
41     actCoordinator(rnactCoordinator)[1..1]
42
43   association assctAuthenticatedactAuthenticated
44     ctAuthenticated(rnctAuthenticated)[1..1]
45     actAuthenticated(rnactAuthenticated)[1..1]
46
47   }
48 }
49 }

```

Listing B.9: Messir Spec. file primarytypes-associations.msr.

B.10 File `./src-gen/messir-spec/concepts/primarytypes-classes/primarytypes-classes.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:38 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.math
10 import lu.uni.lassy.messir.libraries.primitives
11 import lu.uni.lassy.messir.libraries.string
12 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.associations
13 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
14 import lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.datatypes
15 import lu.uni.lassy.excalibur.icrash.spec.environment
16
17 Concept Model {
18
19   Primary Types{
20
21     state class ctState {
22       attribute nextValueForAlertID:dtInteger

```

B.10. FILE /SRC-GEN/MESSIR-SPEC/CONCEPTS/PRIMARYTYPES-CLASSES/PRIMARYTYPES-CLASSE

```
23  attribute nextValueForCrisisID:dtInteger
24  attribute clock:dtDateAndTime
25  attribute crisisReminderPeriod:dtSecond
26  attribute maxCrisisReminderPeriod:dtSecond
27  attribute vpLastReminder:dtDateAndTime
28  attribute vpStarted:ptBoolean
29
30  operation init( AnextValueForAlertID:dtInteger,
31                  AnextValueForCrisisID:dtInteger,
32                  Aclock:dtDateAndTime,
33                  AcrisisReminderPeriod:dtSecond ,
34                  AmaxCrisisReminderPeriod:dtSecond ,
35                  AvpLastReminder:dtDateAndTime ,
36                  AvpStarted:ptBoolean ): ptBoolean
37  }
38
39  class ctAlert role rnctAlert cardinality [0..*]{
40  attribute id:dtAlertID
41  attribute status: etAlertStatus
42  attribute location:dtGPSLocation
43  attribute instant:dtDateAndTime
44  attribute comment:dtComment
45
46  operation init( Aid:dtAlertID ,
47                  Astatus:etAlertStatus ,
48                  Alocation:dtGPSLocation ,
49                  Ainstant:dtDateAndTime ,
50                  Acomment:dtComment ):ptBoolean
51  operation isSentToCoordinator(AactCoordinator:actCoordinator ):ptBoolean
52
53  }
54
55  class ctCrisis role rnctCrisis cardinality [0..*]{
56  attribute id:dtCrisisID
57  attribute type:etCrisisType
58  attribute status: etCrisisStatus
59  attribute location:dtGPSLocation
60  attribute instant:dtDateAndTime
61  attribute comment:dtComment
62
63  operation init(
64      Aid:dtCrisisID ,
65      Atype:etCrisisType ,
66      Astatus:etCrisisStatus ,
67      Alocation:dtGPSLocation ,
68      Ainstant:dtDateAndTime ,
69      Acomment:dtComment ):ptBoolean
70
71  operation handlingDelayPassed():ptBoolean
72  operation maxHandlingDelayPassed():ptBoolean
73  operation isSentToCoordinator(AactCoordinator:actCoordinator ):ptBoolean
74  operation isAllocatedIfPossible():ptBoolean
75  }
76
77  class ctHuman role rnctHuman cardinality [0..*]{
78  attribute id:dtPhoneNumber
79  attribute kind:etHumanKind
80
81  operation init(
82      Aid:dtPhoneNumber ,
83      Akind:etHumanKind ):ptBoolean
84  operation isAcknowledged():ptBoolean
85  }
86
87  class ctAuthenticated
88  role rnctAuthenticated
89  cardinality [0..*]{
90
91  attribute login:dtLogin
92  attribute pwd: dtPassword
```

```

93     attribute vpIsLogged:ptBoolean
94
95     operation init(
96         Alogin:dtLogin ,
97         Apwd:dtPassword ):ptBoolean
98     }
99
100    class ctCoordinator
101        role rnctCoordinator
102        cardinality [0..*]
103        extends ctAuthenticated{
104
105        attribute id:dtCoordinatorID
106
107        operation init(
108            Aid:dtCoordinatorID ,
109            Alogin:dtLogin ,
110            Apwd:dtPassword ):ptBoolean
111        }
112
113    class ctAdministrator
114        role rnctAdministrator
115        cardinality [1..1]
116        extends ctAuthenticated{
117
118        operation init(
119            Alogin:dtLogin ,
120            Apwd:dtPassword ):ptBoolean
121        }
122
123    class ctMedia
124        role rnctMedia
125        cardinality [0..*] {
126
127        attribute id:dtMediaID
128        attribute name:dtMediaName
129        attribute email:dtEmail
130        attribute category:etMediaCategory
131
132        operation init(
133            Aid:dtMediaID ,
134            Aname:dtMediaName ,
135            Aemail:dtEmail ,
136            Acategory:etMediaCategory):ptBoolean
137        }
138    }
139 }
140 }
141 }

```

Listing B.10: Messir Spec. file primarytypes-classes.msr.

B.11 File `./src-gen/messir-spec/concepts/primarytypes-datatypes/primarytypes-datatypes.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:38 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.math
10 import lu.uni.lassy.messir.libraries.primitives
11 import lu.uni.lassy.messir.libraries.string
12
13 Concept Model {

```

```

14
15 Primary Types {
16
17     datatype dtAlertID extends dtString {
18         operation is():ptBoolean
19     }
20     datatype dtCrisisID extends dtString {
21         operation is():ptBoolean
22     }
23     datatype dtLogin extends dtString {
24         operation is():ptBoolean
25     }
26     datatype dtPassword extends dtString {
27         operation is():ptBoolean
28     }
29     datatype dtCoordinatorID extends dtString {
30         operation is():ptBoolean
31     }
32     datatype dtPhoneNumber extends dtString {
33         operation is():ptBoolean
34     }
35     datatype dtComment extends dtString {
36         operation is():ptBoolean
37     }
38     datatype dtLatitude extends dtReal {
39         operation is():ptBoolean
40     }
41     datatype dtLongitude extends dtReal {
42         operation is():ptBoolean
43     }
44     datatype dtGPSLocation {
45         attribute latitude: dtLatitude
46         attribute longitude: dtLongitude
47         operation is():ptBoolean
48         operation isNearTo(AGPSLocation:dtGPSLocation ):ptBoolean
49     }
50
51     datatype dtMediaID extends dtString {
52         operation is():ptBoolean
53     }
54     datatype dtMediaName extends dtString {
55         operation is():ptBoolean
56     }
57     datatype dtEmail extends dtString {
58         operation is():ptBoolean
59     }
60
61     enum etCrisisStatus {
62         constants["pending", "handled", "solved","closed"]
63         operation is():ptBoolean
64     }
65     enum etAlertStatus {
66         constants["pending", "valid", "invalid"]
67         operation is():ptBoolean
68     }
69     enum etCrisisType {
70         constants["small", "medium", "huge"]
71         operation is():ptBoolean
72     }
73     enum etHumanKind {
74         constants["witness", "victim", "anonymous"]
75         operation is():ptBoolean
76     }
77     enum etMediaCategory{
78         constants["car_clash", "public_transport_clash", "pedestrian"]
79         operation is():ptBoolean
80     }
81 }
82 }

```

83 }

Listing B.11: Messir Spec. file primarytypes-datatypes.msr.

B.12 File `./src-gen/messir-spec/concepts/secondarytypes-associations/secondarytypes-associations.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:38 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.associations {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.primitives
10 import lu.uni.lassy.messir.libraries.math
11 import lu.uni.lassy.messir.libraries.string
12
13 Concept Model {
14
15 Secondary Types {
16
17 }
18 }
19 }

```

Listing B.12: Messir Spec. file secondarytypes-associations.msr.

B.13 File `./src-gen/messir-spec/concepts/secondarytypes-classes/secondarytypes-classes.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:38 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.classes {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.string
10 import lu.uni.lassy.messir.libraries.math
11 import lu.uni.lassy.messir.libraries.primitives
12
13 Concept Model {
14
15 Secondary Types {
16
17 }
18 }
19 }

```

Listing B.13: Messir Spec. file secondarytypes-classes.msr.

B.14 File `./src-gen/messir-spec/concepts/secondarytypes-datatypes/secondarytypes-datatypes.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:39 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.concepts.secondarytypes.datatypes {

```



```

7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.math
10 import lu.uni.lassy.messir.libraries.primitives
11 import lu.uni.lassy.messir.libraries.string
12
13 Concept Model {
14
15   Secondary Types {
16     datatype dtSMS {
17       attribute value: ptString
18       operation is():ptBoolean
19     }
20   }
21 }
22 }
23 }

```

Listing B.14: Messir Spec. file secondarytypes-datatypes.msr.

B.15 File ./src-gen/messir-spec/tests/tests.msr

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:39 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.tests {
7
8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.string
10 import lu.uni.lassy.messir.libraries.math
11 import lu.uni.lassy.messir.libraries.primitives
12
13 Test Model {
14
15 }
16
17 }

```

Listing B.15: Messir Spec. file tests.msr.

B.16 File ./src-gen/messir-spec/usecases/usecaseinstance-ugManageCrisis-uciugManageCrisis.msr

```

1 package usecases.uciugManageCrisis {
2 import lu.uni.lassy.excalibur.icrash.spec.usecases
3 import lu.uni.lassy.excalibur.icrash.spec.environment
4 import lu.uni.lassy.excalibur.icrash.spec.usecases
5
6 Use Case Model {
7
8   use case instance uciugManageCrisis : ugManageCrisis{
9     actors {
10       Steve:actCoordinator
11     }
12     use case steps {
13       Steve executed instanceof subfunction oeSetCrisisHandler("1"){
14         ieMessage("You're now consider as handling the crisis") returned to Steve
15       }
16
17       Steve executed instanceof subfunction oeValidateAlert("1"){
18         ieMessage("The Alert is now declared as valid!") returned to Steve
19       }
20
21       Steve executed instanceof subfunction oeSetCrisisStatus("1", "solved") {
22         ieMessage("The crisis status has been updated!") returned to Steve

```

```

23     }
24
25     Steve executed instance of subfunction oeReportOnCrisis("1", "car clash, 2 victims sent to
        hospital...") {
26         ieMessage("The crisis comment has been updated!") returned to Steve
27     }
28
29     Steve executed instance of subfunction oeShareByCrisis("1") {
30         ieMessage("The crisis with ID 1 is chosen for sharing") returned to Steve
31     }
32
33     Steve executed instance of subfunction oeChooseMedia("3") {
34         ieMessage("The media with ID 3 is chosen") returned to Steve
35     }
36
37     Steve executed instance of subfunction oeSendToMedia() {
38         ieMessage("The crisis 1 sent to media 3!") returned to Steve
39     }
40
41     Steve executed instance of subfunction oeCloseCrisis("1") {
42         ieMessage("The crisis is now closed!") returned to Steve
43     }
44
45     }
46 }
47 }
48 }

```

Listing B.16: Messir Spec. file usecaseinstance-ugManageCrisis-uciugManageCrisis.msr.

B.17 File `./src-gen/messir-spec/usecases/usecaseinstance-ugManageSharing-uciugManageSharing.msr`

```

1 package usecases.uciugManageSharing {
2 import lu.uni.lassy.excalibur.icrash.spec.usecases
3 import lu.uni.lassy.excalibur.icrash.spec.environment
4
5 Use Case Model {
6
7     use case instance uciugManageSharing : ugManageSharing {
8         actors {
9             Steve : actCoordinator
10        }
11        use case steps {
12            Steve executed instance of subfunction oeAddMedia("{ID=1, name='News', category=CAR_CLASH, email
                ='accident@news.com'}") {
13                ieMessage("Media News added!") returned to Steve
14            }
15            Steve executed instance of subfunction oeRemoveMedia("1") {
16                ieMessage("Media News removed!") returned to Steve
17            }
18        }
19    }
20 }
21 }

```

Listing B.17: Messir Spec. file usecaseinstance-ugManageSharing-uciugManageSharing.msr.

B.18 File `./src-gen/messir-spec/usecases/usecases.msr`

```

1 /*
2 * @author Kseniya
3 * @date Wed Nov 09 14:31:38 MSK 2016
4 */
5
6 package lu.uni.lassy.excalibur.icrash.spec.usecases {
7

```

```

8 import lu.uni.lassy.messir.libraries.calendar
9 import lu.uni.lassy.messir.libraries.math
10 import lu.uni.lassy.messir.libraries.primitives
11 import lu.uni.lassy.messir.libraries.string
12 import lu.uni.lassy.excalibur.icrash.spec.environment
13 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.classes
14 import lu.uni.lassy.excalibur.icrash.spec.concepts.primarytypes.datatypes
15
16 Use Case Model {
17
18 //-----
19 use case system subfunction oeAddMedia(ActMedia:ctMedia) {
20     actor actCoordinator[primary,active]
21     returned messages {
22         ieMessage(AMessage) returned to actCoordinator
23     }
24 }
25
26 //-----
27 use case system subfunction oeRemoveMedia(AdtMediaID:dtMediaID) {
28     actor actCoordinator[primary,active]
29     returned messages {
30         ieMessage(AMessage) returned to actCoordinator
31     }
32 }
33
34 //-----
35 use case system subfunction oeShareByCrisis(AdtCrisisID:dtCrisisID) {
36     actor actCoordinator[primary,active]
37     returned messages {
38         ieMessage(AMessage) returned to actCoordinator
39     }
40 }
41
42 //-----
43 use case system subfunction oeChooseMedia(AdtMediaID:dtMediaID) {
44     actor actCoordinator[primary,active]
45     returned messages {
46         ieMessage(AMessage) returned to actCoordinator
47     }
48 }
49
50 //-----
51 use case system subfunction oeSendToMedia() {
52     actor actCoordinator[primary,active]
53     returned messages {
54         ieMessage(AMessage) returned to actCoordinator
55     }
56 }
57
58 //-----
59 //-----
60 //-----
61
62 use case system usergoal ugManageSharing() {
63     actor actCoordinator[primary,active]
64
65     reuse oeAddMedia[0..*]
66     reuse oeRemoveMedia[0..*]
67
68     step a: actCoordinator executes oeAddMedia
69     step b: actCoordinator executes oeRemoveMedia
70
71 }
72
73 //-----
74 //-----
75 //-----
76
77 //-----

```

```

78 use case system subfunction oeValidateAlert(AdtAlertID:dtAlertID) {
79     actor actCoordinator[primary,active]
80     returned messages {
81         ieMessage(AMessage) returned to actCoordinator
82     }
83 }
84
85 //-----
86 use case system subfunction oeSetCrisisStatus(AdtCrisisID:dtCrisisID ,AetCrisisStatus:
87     etCrisisStatus) {
88     actor actCoordinator[primary,active]
89     returned messages {
90         ieMessage(AMessage) returned to actCoordinator
91     }
92 }
93 //-----
94 use case system subfunction oeSetCrisisHandler(AdtCrisisID:dtCrisisID) {
95     actor actCoordinator[primary,active]
96     actor actCoordinator[secondary,passive]
97     actor actComCompany[secondary,passive,multiple]
98     returned messages {
99         ieMessage(AMessage)
100         returned to actCoordinator
101         ieSendAnAlert(ActAlert)
102         returned to actCoordinator
103         ieSmsSend(AdtPhoneNumber,AdtSMS)
104         returned to actComCompany
105     }
106 }
107
108 //-----
109 use case system subfunction oeCloseCrisis(AdtCrisisID:dtCrisisID) {
110     actor actCoordinator[primary,active]
111     returned messages {
112         ieMessage(AMessage) returned to actCoordinator
113     }
114 }
115
116 //-----
117 use case system subfunction oeReportOnCrisis(AdtCrisisID:dtCrisisID,AdtComment:dtComment) {
118     actor actCoordinator[primary,active]
119     returned messages {
120         ieMessage(AMessage) returned to actCoordinator
121     }
122 }
123
124 //-----
125 use case system subfunction oeInvalidateAlert(AdtAlertID:dtAlertID) {
126     actor actCoordinator[primary,active]
127     actor actComCompany[secondary,passive]
128     returned messages {
129         ieMessage(AMessage) returned to actCoordinator
130     }
131 }
132
133 //-----
134 //-----
135 //-----
136 use case system usergoal ugManageCrisis() {
137     actor actCoordinator[primary, active]
138
139     reuse oeValidateAlert[0..*]
140     reuse oeSetCrisisStatus[0..*]
141     reuse oeSetCrisisHandler[0..*]
142     reuse oeReportOnCrisis[0..*]
143     reuse oeCloseCrisis[0..*]
144     reuse oeInvalidateAlert[0..*]
145     reuse oeShareByCrisis[0..*]
146     reuse oeChooseMedia[0..*]

```

```

147 reuse oeSendToMedia[0..*]
148
149 step a: actCoordinator executes oeValidateAlert
150 step b: actCoordinator executes oeSetCrisisStatus
151 step c: actCoordinator executes oeSetCrisisHandler
152 step d: actCoordinator executes oeReportOnCrisis
153 step f: actCoordinator executes oeCloseCrisis
154 step g: actCoordinator executes oeInvalidateAlert
155 step h: actCoordinator executes oeShareByCrisis
156 step i: actCoordinator executes oeChooseMedia
157 step k: actCoordinator executes oeSendToMedia
158
159 ordering constraint "managing a crisis is doing one of the indicated use cases."
160 }
161
162 //-----
163 //-----
164 //-----
165
166 //-----
167 use case system subfunction oeGetAlertsSet(AetAlertStatus:etAlertStatus) {
168     actor actCoordinator[primary,active]
169     returned messages {
170         ieSendAnAlert(ActAlert) returned to actCoordinator
171     }
172 }
173 //-----
174 use case system subfunction oeGetCrisisSet(AetCrisisStatus:etCrisisStatus){
175     actor actCoordinator[primary,active]
176     returned messages {
177         ieSendACrisis(ActCrisis) returned to actCoordinator
178     }
179 }
180
181 //-----
182 //-----
183 //-----
184
185 use case system usergoal ugMonitor() {
186     actor actCoordinator[primary,active]
187
188     reuse oeGetCrisisSet[0..*]
189     reuse oeGetAlertsSet[0..*]
190
191     step a: actCoordinator executes oeGetAlertsSet
192     step b: actCoordinator executes oeGetCrisisSet
193 }
194
195 //-----
196 //-----
197 //-----
198
199 use case system usergoal ugSecurelyUseSystem() {
200     actor actCoordinator[primary,active]
201     // TODO
202 }
203
204 //-----
205 //-----
206 //-----
207
208 use case system summary suGlobalCrisisHandling() {
209     actor actCoordinator[primary,active]
210
211     reuse ugSecurelyUseSystem[1..*]
212     reuse ugMonitor[1..*]
213     reuse ugManageCrisis[1..*]
214     reuse ugManageSharing[1..*]
215
216     step a: actCoordinator executes ugSecurelyUseSystem

```

```
217  step b: actCoordinator executes ugMonitor
218  step c: actCoordinator executes ugManageCrisis
219  step d: actCoordinator executes ugManageSharing
220
221  ordering constraint "steps (a) (b) (c) and (d) executions are interleaved
222    (steps (b) (c) and (d) have their protocol constrained by steps of (a))."
223  ordering constraint "steps (a) (b) (c) and (d) can be executed multiple times."
224  }
225
226  }
227
228 }
```

Listing B.18: Messir Spec. file usecases.msr.

Bibliography

- [1] Guelfi, N.: Messir: A Scientific Method for the Software Engineer. to be published (2017)
- [2] Armour, F., Miller, G.: Advanced Use Case Modeling: Software Systems. Addison-Wesley (2001)