Part 2: Object model, rules and service definition

In this part, the contents of the project for the challenge can be found.

Normally, ALEF would make a nice and tidy export in either Excel of HTML, but the use of the English language makes it necessary to make screenshots of ALEF instead. This causes some glitches in formatting, unfortunately.

Object model

The colors mark the different types:

Type	Color
Objecttype	Purple
Characteristic	Brown
Attribute	Green
Dark blue	Role in fact type

A domain is used to re-use a specific datatype. For example: A domain with whole numbers, currency Euro, can be called My Euro and be reused throughout the model. This was done here for the type of organ, the decisions for Offer and Block and the next action code.

Objectmodel Object model

Objecttype the Message

    << ... >>

Objecttype the Block

is	in fallback phase	characteristic (adjective);
is	accepted	characteristic (adjective);
	all organs in block accepted	characteristic (posessive);
	all organs in block declined	characteristic (posessive);
	one organ in block accepted	characteristic (posessive);
	one organ completely declined	characteristic (posessive);
the	number of offers in block	Numeric (round number);
the	number of offers in block status waiting	Numeric (round number);
the	number of offers in block status accepted	Numeric (round number);
the	number of offers in block status completely declined	Numeric (round number);
the	previous priority	Numeric (round number);
the	previous decision	decisions;

Objecttype the Offer

is	waiting on other organ in block	characteristic (adjective);
is	completely declined	characteristic (adjective);
is	accepted	characteristic (adjective);
the	previous priority	Numeric (round number);
the	previous decision (mv: previous decisions) decisions;	

Objecttype the Organ

    the type organ types;

Objecttype the Candidate (bezield)

the	eligible candidate	characteristic;
the	receiving candidate	characteristic;
the	name	text;
the	priority	Numeric (round number);
the	organ type needed	*organ types*;

Objecttype the Transplant centre

the	eligible transplant centre	characteristic;
the	receiving transplant centre	characteristic;
the	name	text;
the	priority	Numeric (round number);

Objecttype the Next action

the	next action code	*next action codes*;
the	next action text	*action message*;

Domain action message is of type text

Domain organ types is of type Enumeration
> heart
> lung

Domain decisions is of type Enumeration
> accepted
> declined
> partially accepted

Domain next action codes is of type Enumeration
> Actions for offers exhausted. Proceed to fall back phase
> Contact candidate with offer of organ
> Send organ in offer to candidate
> Hold offer while waiting for other offers in block
> Offer block to transplant center
> Offer remaining organs in block to transplant center
> Send organ in block to transplant center
> Send block to transplant center
> Block completely declined. Challenge does not state what to do next
> Actions for organ(s) in block exhausted. Challenge does not state what to do next

Fact types

Objectmodel Fact types

Binairy facttype Message contains block
the message with block   Message
the block within message   Block
one message with block contains *one* block within message

Binairy facttype Block contains offers
the block with offers   Block
the offer in block (mv: offers in block) Offer
one block with offers contains *more* offers in block

Binairy facttype Next action for block
the block of action   Block
the action for block (mv: actions for block) Next action
one block of action   *more* actions for block

Binairy facttype Offer of organ
the organ in offer   Organ
the offer of organ (mv: offers of organs) Offer
one organ in offer is offered as *one* offer of organ

Binairy facttype Next action for offer
the offer of action   Offer
the action for offer   Next action
one offer of action   *one* action for offer

Binairy facttype Candidiate in transplant centre
the Candidate in transplant centre (mv: candidates in transplant centre) Candidate
the transplant centre of candidate (mv: transplant centres of candidate) Transplant centre
more candidates in transplant centre are treated in *one* transplant centre of candidate

Binairy facttype Message contains transplant centre
the message with transplant centre   Message
the transplant centre within message (mv: transplant centres within message) Transplant centre
one message with transplant centre contains *more* transplant centres within message

Binairy facttype Message contains candidate
the message with candidate   Message
the candidate within message (mv: candidates within message) Candidate
one message with candidate contains *more* candidates within message

Binairy facttype Offer to receiving candidate

> the offer to receiving candidate   Offer
> the receiving candidate of offer   Candidate

one   offer to receiving candidate is sent to one   receiving candidate of offer

Binairy facttype Offer to eligible candidate

> the offer to eligible candidate   Offer
> the eligible candidate to contact with offer   Candidate

one   offer to eligible candidate is offered to one   eligible candidate to contact with offer

Binairy facttype Block to eligible transplant centre

> the block to eligible transplant centre   Block
> the eligible transplant centre to contact with block   Transplant centre

one   block to eligible transplant centre is offered to one   eligible transplant centre to contact with block

Binairy facttype Block to receiving transplant centre

> the block to receiving transplant centre   Block
> the receiving transplant centre of block   Transplant centre

one   block to receiving transplant centre is offered to one   receiving transplant centre of block

Binairy facttype Partially accepted block to transplant centre

> the block partly to receiving transplant centre   Block
> the receiving transplant centre of part of block   Transplant centre

one   block partly to receiving transplant centre is offered to one   receiving transplant centre of part of block

Binairy facttype Organ in partially accepted block for action

> the organ in partially accepted block   Organ
> the next action for organ in partially accepted block   Next action

one   organ in partially accepted block is offered to one   next action for organ in partially accepted block

Rules

Rulegroup nitialisation rules

Rule previous priority offer 01
    validity   always

> The previous priority of an Offer should be set at 0.

Rule previous priority block 01
    validity   always

> The previous priority of a Block should be set at 0.

For Offer

Rulegroup Next action for offer to candidate

Rule next action for offer 01
    validity   always

> An offer to eligible candidate has action for offer with next action code equal to 'Contact candidate with offer of organ' and
> next action text equal to "Contact «the name of eligible candidate to contact with offer of the offer to eligible candidate» at
>   «the name of transplant centre of candidate of eligible candidate to contact with offer of the offer to eligible candidate» with offer of
>   «the type of organ in offer of the offer to eligible candidate»"
> if block with offers of the offer to eligible candidate is not in fallback phase.

Rule next action for offer 02
    validity   always

> An Offer has action for offer with next action code equal to 'Actions for offers exhausted. Proceed to fall back phase' and
> next action text equal to "Actions for offers exhausted. Proceed to fall back phase"
> if all of following conditions are met:
> - block with offers of the Offer is not in fallback phase
> - the Offer is not waiting on other organ in block
> - the count of eligible candidate to contact with offer of the Offer is equal to 0
> - the count of receiving candidate of offer of the Offer is equal to 0
> - the previous priority of the Offer is equal to the count of
>   candidates within message of message with block of block with offers of the Offer which meets the following condition:
>   •• the organ type needed of the candidate within message is equal to the type of organ in offer of the Offer...

Rule next action for offer 03

validity   always

An offer to receiving candidate has action for offer with next action code equal to 'Send organ in offer to candidate' and

next action text equal to "Send «the type of organ in offer of the offer to receiving candidate» to

«the name of receiving candidate of offer of the offer to receiving candidate» at «the name of his transplant centre of candidate» "

if block with offers of the offer to receiving candidate is not in fallback phase.

Rule next action for offer 04

validity   always

An Offer has action for offer with next action code equal to 'Hold offer while waiting for other offers in block' and

next action text equal to "Offer needs to wait for decisions on other offers of organs in block."

if all of following conditions are met:
- block with offers of the Offer is not in fallback phase
- the Offer is waiting on other organ in block.

Rulegroup Candidate selection for action

Rule fact creation eligible candidate to contact with offer 01

validity   always

eligible candidate to contact with offer of an Offer is

candidate within message of message with block of block with offers of the Offer

if all of following conditions are met:
- the candidate within message is a(n) eligible candidate
- the type of organ in offer of the Offer is equal to the organ type needed of the candidate within message.

Rule eligible candidate 01

validity   always

A Candidate is an eligible candidate

if exactly one of the offers in block of block within message of his message with candidate meets all of following conditions:
- the offer in block meets exactly one of the following conditions:
  - • the previous decision of the offer in block is equal to 'declined'
  - • the previous decision of the offer in block be empty
- the type of organ in offer of the offer in block is equal to his organ type needed
- his priority is equal to the previous priority of the offer in block plus
  1.

Rule fact creation receiving candidiate with offer 01

    validity   always

> receiving candidate of offer of an Offer is
>
> candidate within message of   message with block of   block with offers of the Offer
>
> if all of following conditions are met:
>
>   • the candidate within message is a(n) receiving candidate
>
>   • the type of   organ in offer of the Offer is equal to the organ type needed of the candidate within message.

Rule receiving candidiate 01

    validity   always

> A Candidate is a receiving candidate
>
> if exactly one of the offers in block of   block within message of his message with candidate meets all of following conditions:
>
>   • the previous decision of the offer in block is equal to 'accepted'
>
>   • the type of   organ in offer of the offer in block is equal to his organ type needed
>
>   • his priority is equal to the previous priority of the offer in block.

Rulegroup Offer status accepted

Rule offer accepted 01

    validity   always

> An Offer is accepted
>
> if the previous decision of the Offer is equal to 'accepted'.

Rulegroup Offer status completely declined

Rule offer completely declined 01

    validity   always

> An Offer is completely declined
>
> if the Offer meets all of following conditions:
>
>   • the previous decision of the Offer is equal to 'declined'
>
>   • the previous priority of the Offer is equal to the count of
>
>   candidates within message of   message with block of   block with offers of the Offer which meets the following condition:
>
>   •• his organ type needed is equal to the type of   organ in offer of the Offer...

Rulegroup Offer status waiting on other organ in block

Rule offer waiting on other organ in block 01

    validity   always

> An Offer is waiting on other organ in block
>
> if the Offer meets all of following conditions:
>
>   • the number of offers in block of   block with offers of the Offer is greater than 1
>
>   • the Offer is completely declined
>
>   • the number of offers in block status accepted of the block with offers plus
>
>   the number of offers in block status completely declined of the block with offers
>
>   is less than the number of offers in block of the block with offers.

For Block

Rulegroup Next action for block

Rule next action 01
   validity always

> A Block has action for block with next action code equal to 'Offer block to transplant center' and
> next action text equal to "Contact «the name of eligible transplant centre to contact with block of the Block» with offer of block "
> if the Block meets all of following conditions:
> - the Block has not one organ completely declined
> - the Block has not all organs in block declined
> - the Block has not one organ in block accepted
> - the Block is not accepted
> - the Block is in fallback phase.

Rule next action 02
   validity always

> A Block has action for block with next action code equal to 'Offer remaining organs in block to transplant center' and
> next action text equal to "Contact «the name of eligible transplant centre to contact with block of the Block»
>   with offer of remaining organs in block "
> if the Block meets all of following conditions:
> - the Block has one organ in block accepted
> - the Block has not one organ completely declined
> - the Block is in fallback phase.

Rule next action 03a
   validity always

> A Block has action for block with next action code equal to 'Send block to transplant center' and
> next action text equal to "Send block of organs to«the name of receiving transplant centre of block of the Block» "
> if the Block meets all of following conditions:
> - the Block is accepted
> - the Block is in fallback phase.

Rule next action 03b
   validity always

> A Block has action for block with next action code equal to 'Send organ in block to transplant center'
> if the Block meets all of following conditions:
> - the Block has one organ in block accepted
> - the Block is in fallback phase.

Rule next action text for partially accepted organ

    validity   always

The next action text of a Next action should be set at "Send organ «the type of organ in partially accepted block of the Next action» to «the name of receiving transplant centre of part of block of block of action of the Next action» "
if the next action code of the Next action is equal to 'Send organ in block to transplant center'.

Rule next action 04

    validity   always

A Block has action for block with next action code equal to 'Block completely declined. Challenge does not state what to do next' and next action text equal to "Block of organs declined by all transplant centres. Please advise."
if the Block meets all of following conditions:
- the Block has all organs in block declined
- the Block is in fallback phase.

Rule next action 05

    validity   always

A Block has action for block with next action code equal to 'Actions for organ(s) in block exhausted. Challenge does not state what to do next' and next action text equal to "Block of organs partially accepted. Other organs in block declined by all transplant centres. Please advise."
if the Block meets all of following conditions:
- the Block has one organ completely declined
- the Block is in fallback phase.

Rulegroup All organs in block accepted

Rule all organs in block accepted 01

    validity   always

A Block has all organs in block accepted
if the previous decision of the Block is equal to 'accepted'.

Rulegroup Block status accepted

Rule Block with one organ accepted
validity   always

A Block has one organ in block accepted
if all of following conditions are met:
- the count of receiving transplant centre of part of block of the Block is equal to 1
- the Block is in fallback phase.

Rule Block completely accepted
validity   always

A Block is accepted
if all of following conditions are met:
- the count of receiving transplant centre of block of the Block is equal to 1
- the count of receiving transplant centre of part of block of the Block is equal to 0
- the count of eligible transplant centre to contact with block of the Block is equal to 0
- the Block is in fallback phase.

Rulegroup Block status completely declined

Rule Block completely declined
validity   always

A Block has all organs in block declined
if all of following conditions are met:
- the count of eligible transplant centre to contact with block of the Block is equal to 0
- the count of receiving transplant centre of block of the Block is equal to 0
- the count of receiving transplant centre of part of block of the Block is equal to 0
- the previous priority of the Block is equal to the count of transplant centres within message of message with block of the Block
- the Block is in fallback phase.

Rulegroup Block status one organ completely declined

Rule Block completely declined
validity   always

A Block has one organ completely declined
if all of following conditions are met:
- the count of eligible transplant centre to contact with block of the Block is equal to 0
- the count of receiving transplant centre of part of block of the Block is equal to 1
- the previous priority of the Block is equal to the count of transplant centres within message of message with block of the Block
- the Block is in fallback phase.

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Rulegroup Organ selection for partially accepted Block

Rule fact creation for organ type in next action 01
　　validity　always

> organ in partially accepted block of a Next action is
> organ in offer of offer in block of block of action of the Next action
> if all of following conditions are met:
> - the previous decision of the offer in block is equal to 'accepted'
> - the previous decision of the block of action is equal to 'partially accepted'
> - the next action code of the Next action is equal to 'Send organ in block to transplant center'.

Rulegroup Transplant centre selection for action

Rule fact creation eligible transplant centre to contact with block 01
　　validity　always

> eligible transplant centre to contact with block of a Block is
> transplant centre within message of message with block of the Block
> if all of following conditions are met:
> - the transplant centre within message is a(n) eligible transplant centre
> - the Block is in fallback phase.

Rule eligible TC 01
　　validity　always

> A Transplant centre is an eligible transplant centre
> if block within message of message with transplant centre of the Transplant centre meets all of following conditions:
> - the block within message meets exactly one of the following conditions:
>   - the previous decision of the block within message is equal to 'partially accepted'
>   - the previous decision of the block within message is equal to 'declined'
>   - the previous decision of the block within message be empty
> - the priority of the Transplant centre is equal to (the previous priority of the block within message plus 1).

Rule fact creation receiving transplant centre to contact with block 01
　　validity　always

> receiving transplant centre of block of a Block is
> transplant centre within message of message with block of the Block
> if all of following conditions are met:
> - the transplant centre within message is a(n) receiving transplant centre
> - the previous decision of the Block is equal to 'accepted'.

Rule fact creation receiving transplant centre to contact with block 02
　　validity　always

> receiving transplant centre of part of block of a Block is
> transplant centre within message of message with block of the Block
> if all of following conditions are met:
> - the transplant centre within message is a(n) receiving transplant centre
> - the previous decision of the Block is equal to 'partially accepted'.

Rule receiving transplant centre 01
   validity   always

A Transplant centre is a receiving transplant centre
if   block within message of message with transplant centre of the Transplant centre meets all of following conditions:
    • the block within message meets exactly one of the following conditions:
      •• the previous decision of the block within message is equal to 'accepted'
      •• the previous decision of the block within message is equal to 'partially accepted'
    • the priority of the Transplant centre is equal to the previous priority of the block within message.