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A

Lei do Aeroporto

```

1 <Laws xmlns:xi="http://www.w3.org/2001/XMLSchema" >
2
3   <LawOrganization id="airport" name="Santos_Dumont_Airport">
4     <!-- Role definition -->
5     <Role id="customer" />
6     <Role id="announcer" />
7     <Role id="seller" />
8     <Role id="bank" />
9
10    <!-- ++++++Scenes+++++ -->
11    <!-- ++++++Scenes+++++ -->
12    <!-- ++++++Scenes+++++ -->
13
14
15    <!-- ++++++Announcement Scene+++++ -->
16
17    <Scene id="announcement" time-to-live="10000">
18      <!-- 10 sec. -->
19      <Protocol id="announcement-protocol">
20        <Messages>
21          <Message id="m1" performative="request">
22            <Content>
23              <Entry key="hello" value="hello"/>
24            </Content>
25            <Sender role-ref="customer" role-instance="?" />
26            <Receivers>
27              <Receiver role-ref="announcer" role-instance="?" />
28            </Receivers>
29          </Message>
30          <Message id="m2" performative="inform">
31            <Content>
32              <!-- services must match a list where ; is the element
33                  separator-->
34              <Entry key="services" value="(.+;)*[^;]+"/>
35            </Content>
36            <Sender role-ref="announcer" role-instance="?" />
37            <Receivers>
38              <Receiver role-ref="customer" role-instance="?" />
39            </Receivers>
40          </Message>
41        </Messages>
42        <States>
43          <State id="s0" type="initial" label="Initial_State" />
44          <State id="s1" type="execution" label="Message_sent" />
45          <State id="s2" type="success" label="Response_answered" />
46        </States>
47        <Transitions>

```

```

47         <Transition id="t1" from="s0" to="s1" ref="m1" event-type="
           message_arrival" />
48         <Transition id="t2" from="s1" to="s2" ref="m2" event-type="
           message_arrival"/>
49     </Transitions>
50 </Protocol>
51 <Creators>
52     <Creator role_ref="customer"/>
53     <Creator role_ref="announcer"/>
54     <Creator role_ref="seller"/>
55     <Creator role_ref="bank"/>
56 </Creators>
57 <Entrance>
58     <Participant role_ref="customer" limit="1">
59         <State ref="s0"/>
60     </Participant>
61     <Participant role_ref="announcer" limit="1">
62         <State ref="s1"/>
63     </Participant>
64 </Entrance>
65 <Clock id="time-for-answering-hello" type="once" tick-period="5000">
66     <!-- 5 sec. -->
67     <Activations>
68         <Element ref="t1" event-type="transition_activation"/>
69     </Activations>
70     <Deactivations>
71         <Element ref="t2" event-type="transition_activation"/>
72     </Deactivations>
73 </Clock>
74 </Scene>
75
76 <!-- ++++++Selection Scene+++++-->
77
78 <Scene id="selection" time-to-live="60000">
79
80     <!-- 1 min. -->
81     <Protocol id="selection-protocol">
82         <Messages>
83             <Message id="m3" performative="request">
84                 <Content>
85                     <Entry key="service" value="."/ >
86                 </Content>
87                 <Sender role-ref="customer" role-instance="?" />
88                 <Receivers>
89                     <Receiver role-ref="announcer" role-instance="?" />
90                 </Receivers>
91             </Message>
92             <Message id="m4" performative="inform">
93                 <Content>
94                     <Entry key="products" value="(.;)*[^;]+"/>
95                 </Content>
96                 <Sender role-ref="announcer" role-instance="?" />
97                 <Receivers>
98                     <Receiver role-ref="customer" role-instance="?" />
99                 </Receivers>
100            </Message>
101            <Message id="m5" performative="request">
102                <Content>
103                    <Entry key="product" value="."/ >

```

```

104         </Content>
105         <Sender role-ref="customer" role-instance="?" />
106         <Receivers>
107             <Receiver role-ref="announcer" role-instance="?" />
108         </Receivers>
109     </Message>
110     <Message id="m6" performative="inform">
111         <Content>
112             <Entry key="sellers" value="(.;)*[^;]+"/>
113         </Content>
114         <Sender role-ref="announcer" role-instance="?" />
115         <Receivers>
116             <Receiver role-ref="customer" role-instance="?" />
117         </Receivers>
118     </Message>
119 </Messages>
120 <States>
121     <State id="s3" type="initial" label="Ready_to_ask_for_options"
122         />
123     <State id="s4" type="execution" label="List_of_products_
124         requested"/>
125     <State id="s5" type="execution" label="List_of_products_
126         informed"/>
127     <State id="s6" type="execution" label="List_of_sellers_
128         requested"/>
129     <State id="s7" type="success" label="List_of_sellers_informed"
130         />
131 </States>
132 <Transitions>
133     <Transition id="t3" from="s3" to="s4" ref="m3" event-type="
134         message_arrival"/>
135     <Transition id="t4" from="s4" to="s5" ref="m4" event-type="
136         message_arrival"/>
137     <Transition id="t5" from="s5" to="s6" ref="m5" event-type="
138         message_arrival">
139     <ActiveNorms>
140         <Norm ref="products"/>
141     </ActiveNorms>
142 </Transition>
143     <Transition id="t6" from="s6" to="s7" ref="m6" event-type="
144         message_arrival"/>
145 </Transitions>
146 <Norm type="permission" id="products">
147     <Assignee role-ref="seller" role-instance="?" />
148     <Activations>
149         <Element ref="t3" event-type="transition_activation"/>
150     </Activations>
151 </Norm>
152 </Protocol>
153 <Creators>
154     <Creator role_ref="customer"/>
155     <Creator role_ref="announcer"/>
156     <Creator role_ref="seller"/>
157     <Creator role_ref="bank"/>
158 </Creators>
159 <Entrance>
160     <Participant role_ref="customer" limit="1">
161         <State ref="s3"/>
162     </Participant>

```

```

154         <Participant role_ref="announcer" limit="1">
155             <State ref="s4"/>
156         </Participant>
157     </Entrance>
158 </Scene>
159
160 <!-- ++++++Negotiation Scene+++++-->
161
162 <Scene id="negotiation" time-to-live="infinity">
163
164     <Protocol id="negotiation-protocol">
165         <Messages>
166             <Message id="m7" performative="cfp">
167                 <Content>
168                     <Entry key="product" value="."/>
169                     <Entry key="price" value="\d+"/>
170                 </Content>
171                 <Sender role_ref="customer" role-instance="?" />
172                 <Receivers>
173                     <Receiver role_ref="seller" role-instance="?" />
174                 </Receivers>
175             </Message>
176             <Message id="m8" performative="propose">
177                 <Content>
178                     <Entry key="product" value="."/>
179                     <Entry key="price" value="\d+"/>
180                 </Content>
181                 <Sender role_ref="seller" role-instance="?" />
182                 <Receivers>
183                     <Receiver role_ref="customer" role-instance="?" />
184                 </Receivers>
185             </Message>
186             <Message id="m9" performative="accept-proposal">
187                 <Content>
188                     <Entry key="info" value=".*"/>
189                 </Content>
190                 <Sender role_ref="customer" role-instance="?" />
191                 <Receivers>
192                     <Receiver role_ref="seller" role-instance="?" />
193                 </Receivers>
194             </Message>
195             <Message id="m10" performative="inform">
196                 <Content>
197                     <Entry key="bank" value="."/>
198                 </Content>
199                 <Sender role_ref="seller" role-instance="?" />
200                 <Receivers>
201                     <Receiver role_ref="customer" role-instance="?" />
202                 </Receivers>
203             </Message>
204             <Message id="m11" performative="refuse">
205                 <Content>
206                     <Entry key="reason" value="."/>
207                 </Content>
208                 <Sender role_ref="seller" role-instance="?" />
209                 <Receivers>
210                     <Receiver role_ref="customer" role-instance="?" />
211                 </Receivers>
212             </Message>

```

```

213     <Message id="m12" performative="reject-proposal">
214         <Content>
215             <Entry key="reason" value="."/ >
216         </Content>
217         <Sender role-ref="customer" role-instance="?" />
218         <Receivers>
219             <Receiver role-ref="seller" role-instance="?" />
220         </Receivers>
221     </Message>
222     <Message id="m13" performative="cancel">
223         <Content>
224             <Entry key="reason" value="."/ >
225         </Content>
226         <Sender role-ref="seller" role-instance="?" />
227         <Receivers>
228             <Receiver role-ref="customer" role-instance="?" />
229         </Receivers>
230     </Message>
231 </Messages>
232 <States>
233     <State id="s8" type="initial" label="Ready_for_starting_
negotiations"/>
234     <State id="s9" type="execution" label="Call_for_proposal_
requested"/>
235     <State id="s10" type="execution" label="Proposal_sent"/>
236     <State id="s11" type="execution" label="Proposal_accepted"/>
237     <State id="s12" type="success" label="Bank_informed"/>
238     <State id="s13" type="failure" label="Refuse_sending_proposal"
/>
239     <State id="s14" type="failure" label="Proposal_rejected"/>
240     <State id="s15" type="failure" label="Too_long_time_to_decide"
/>
241 </States>
242 <Transitions>
243     <Transition id="t7" from="s8" to="s9" ref="m7" event-type="
message_arrival">
244         <Constraints>
245             <Constraint class="br.pucrio.inf.les.law.app.airport.
repairactions.EnforceValue">
246                 <Semantic>Gets value on price</Semantic>
247             </Constraint>
248         </Constraints>
249     </Transition>
250     <Transition id="t8" from="s9" to="s10" ref="m8" event-type="
message_arrival">
251         <Constraints>
252             <Constraint class="br.pucrio.inf.les.law.app.airport.
repairactions.EnforceValue">
253                 <Semantic>Enforces value on price</Semantic>
254             </Constraint>
255         </Constraints>
256     </Transition>
257     <Transition id="t9" from="s10" to="s11" ref="m9" event-type="
message_arrival"/>
258     <Transition id="t10" from="s11" to="s12" ref="m10" event-type="
message_arrival"/>
259     <Transition id="t11" from="s9" to="s13" ref="m11" event-type="
message_arrival"/>

```



```

260         <Transition id="t12" from="s10" to="s14" ref="m12" event-type=
           "message_arrival"/>
261         <Transition id="t13" from="s10" to="s15" ref="m13" event-type=
           "message_arrival">
262             <ActiveNorms>
263                 <Norm ref="seller-permission-to-cancel"/>
264             </ActiveNorms>
265         </Transition>
266     </Transitions>
267 </Protocol>
268 <Creators>
269     <Creator role_ref="customer"/>
270     <Creator role_ref="announcer"/>
271     <Creator role_ref="seller"/>
272     <Creator role_ref="bank"/>
273 </Creators>
274 <Entrance>
275     <Participant role_ref="customer" limit="1">
276         <State ref="s8"/>
277     </Participant>
278     <Participant role_ref="seller" limit="1">
279         <State ref="s9"/>
280     </Participant>
281 </Entrance>
282 <Clock id="time-to-decide" type="once" tick-period="20000">
283     <!-- 20 sec. -->
284     <Activations>
285         <Element ref="t8" event-type="transition_activation"/>
286     </Activations>
287     <Deactivations>
288         <Element ref="t9" event-type="transition_activation"/>
289         <Element ref="t12" event-type="transition_activation"/>
290     </Deactivations>
291 </Clock>
292 <Norm type="permission" id="seller-permission-to-cancel">
293     <Activations>
294         <Element ref="time-to-decide" event-type="clock_tick"/>
295     </Activations>
296 </Norm>
297 </Scene>
298
299 <!-- ++++++Payment Scene+++++>
300
301 <Scene id="payment" time-to-live="infinity">
302
303     <Protocol id="payment-protocol">
304         <Messages>
305             <Message id="m14" performative="request">
306                 <Content>
307                     <Entry key="amount" value="\d+"/>
308                     <Entry key="to" value="."/ >
309                 </Content>
310                 <Sender role_ref="customer" role-instance="?" />
311                 <Receivers>
312                     <Receiver role_ref="bank" role-instance="?" />
313                 </Receivers>
314             </Message>
315             <Message id="m15" performative="inform">
316                 <Content>

```

```

317         <Entry key="receipt" value="." />
318     </Content>
319     <Sender role-ref="bank" role-instance="?" />
320     <Receivers>
321         <Receiver role-ref="customer" role-instance="?" />
322     </Receivers>
323 </Message>
324 </Messages>
325 <States>
326     <State id="s16" type="initial" label="Ready_for_payment"/>
327     <State id="s17" type="execution" label="Payment_order_emitted"
328         />
329     <State id="s18" type="success" label="Receipt_sent"/>
330 </States>
331 <Transitions>
332     <Transition id="t14" from="s16" to="s17" ref="m14" event-type=
333         "message_arrival">
334         <ActiveNorms>
335             <Norm ref="permission-to-pay"/>
336         </ActiveNorms>
337     </Transition>
338     <Transition id="t15" from="s17" to="s18" ref="m15" event-type=
339         "message_arrival"/>
340 </Transitions>
341 </Protocol>
342 <Creators>
343     <Creator role-ref="customer"/>
344 </Creators>
345 <Entrance>
346     <Participant role-ref="customer" limit="1">
347         <State ref="s16"/>
348     </Participant>
349     <Participant role-ref="bank" limit="1">
350         <State ref="s17"/>
351     </Participant>
352 </Entrance>
353 </Scene>
354
355 <!-- ++++++Global Norms+++++ -->
356 <!-- ++++++Global Norms+++++ -->
357 <!-- ++++++Global Norms+++++ -->
358
359 <Norm type="permission" id="permission-to-pay">
360     <Activations>
361         <Element ref="negotiation" event-type="sucessful_scene_completion"
362             />
363     </Activations>
364     <Deactivations>
365         <Element ref="payment" event-type="sucessful_scene_completion"/>
366     </Deactivations>
367 </Norm>
368
369 </LawOrganization>
370 </Laws>

```

Listagem A.1: Lei do Aeroporto

B**Script para Aplicação do Aeroporto**

```
1 manager announcer customer UCI Cinemark Itau BB
2
3 manager: addLaw http://www.les.inf.puc-rio.br/xmlaw/airport.xml
4 set airportOrgId
5 $last.orgExecutionId
6
7 announcer:
8 enterOrg $airportOrgId
9 performRole $airportOrgId announcer
10
11 customer:
12 enterOrg $airportOrgId
13 performRole $airportOrgId customer
14
15 UCI:
16 enterOrg $airportOrgId
17 performRole $airportOrgId seller
18
19 Cinemark:
20 enterOrg $airportOrgId
21 performRole $airportOrgId seller
22
23 Itau:
24 enterOrg $airportOrgId
25 performRole $airportOrgId bank
26
27 BB:
28 enterOrg $airportOrgId
29 performRole $airportOrgId bank
30
31 #####
32 #####ANNOUNCEMENT SCENE#####
33 #####
34
35 customer:
36 startScene $airportOrgId announcement
37 set announcementSceneId $last.sceneExecutionId
38 enterScene $airportOrgId $announcementSceneId customer
39 msg m1 request
40 set m1.hello hello
41 set m1.orgExecutionId $airportOrgId
42 set m1.sceneExecutionId $announcementSceneId
43 set m1.receiver1 announcer
44 set m1.receiverRole1 announcer
45 set m1.senderRole customer
46 send $m1
47
48 announcer:
```

```

49 receive 0 rm1
50 enterScene $airportOrgId $announcementSceneId announcer
51 reply $rm1 m2 inform
52 set m2.services movies;date;food
53 send $m2
54
55 customer:
56 receive 0 rm2
57 assert $rm2.services movies;date;food
58
59 #####
60 #####SELECTION SCENE#####
61 #####
62
63 customer:
64 startScene $airportOrgId selection
65 set selectionScene $last.sceneExecutionId
66 enterScene $airportOrgId $selectionScene customer
67 msg m3 request
68 set m3.service movies
69 set m3.orgExecutionId $airportOrgId
70 set m3.sceneExecutionId $selectionScene
71 set m3.receiver1 announcer
72 set m3.receiverRole1 announcer
73 set m3.senderRole customer
74 send $m3
75
76 announcer:
77 receive 0 rm3
78 enterScene $airportOrgId $selectionScene announcer
79 reply $rm3 m4 inform
80 set m4.products IndianaJones;SpiderMan;StarWars
81 send $m4
82
83 customer:
84 receive 0 rm4
85 reply $rm4 m5
86 request set m5.product SpiderMan
87 send $m5
88
89 announcer:
90 receive 0 rm5
91 reply $rm5 m6 inform
92 set m6.sellers UCI;Cinemark
93 send $m6
94
95 customer:
96 receive 0 rm6
97 assert $rm6.sellers UCI;Cinemark
98
99 #####
100 #####NEGOTIATION SCENE#####
101 #####
102
103 customer:
104 startScene $airportOrgId negotiation
105 set negotiationScene $last.sceneExecutionId
106 enterScene $airportOrgId $negotiationScene customer
107 msg m7 cfp

```

```

108 set m7.product IndianaJones
109 set m7.price 10
110 set m7.orgExecutionId $airportOrgId
111 set m7.sceneExecutionId $negotiationScene
112 set m7.receiver1 UCI
113 set m7.receiverRole1 seller
114 set m7.senderRole customer
115 send $m7
116
117 UCI:
118 receive 0 rm7
119 enterScene $airportOrgId $negotiationScene seller
120 reply $rm7 m8 propose
121 set m8.product IndianaJones
122 set m8.price 8
123 send $m8
124
125 customer:
126 receive 0 rm8
127 reply $rm8 m9 accept-proposal
128 set m9.info ok
129 send $m9
130
131 UCI:
132 receive 0 rm9
133 reply $rm9 m10 inform
134 set m10.bank Itau
135 send $m10
136
137 customer:
138 receive 0 rm10
139 assert $m10.bank Itau
140
141 #####
142 #####PAYMENT SCENE#####
143 #####
144
145 customer:
146 startScene $airportOrgId payment
147 set paymentScene $last.sceneExecutionId
148 enterScene $airportOrgId $paymentScene
149 customer msg m14 request
150 set m14.amount 8
151 set m14.to UCI
152 set m14.orgExecutionId $airportOrgId
153 set m14.sceneExecutionId $paymentScene
154 set m14.receiver1 Itau
155 set m14.receiverRole1 bank
156 set m14.senderRole customer
157 send $m14
158
159 Itau:
160 receive 0 rm14
161 enterScene $airportOrgId $paymentScene bank
162 reply $rm14 m15 inform
163 set m15.receipt receiptkey=12345
164 send $m15
165
166 customer:

```

```
167 receive 0 rm15
168 assert $rm15.receipt receiptkey=12345
169
170 #####
171 #####DISCONNECTING AGENTS#####
172 #####
173
174 manager:
175 disconnect
176
177 announcer:
178 disconnect
179
180 customer:
181 disconnect
182
183 UCI:
184 disconnect
185
186 Cinemark:
187 disconnect
188
189 Itau:
190 disconnect
191
192 BB:
193 disconnect
```

Listagem B.1: Script para Lei do Aeroporto

C

Script para Teste de Carga da Aplicação SELIC

```

1  IFA[{execIndex}] IFB[{execIndex}]
2
3  IFA[{execIndex}]:
4  receive 0 startMsgIF1
5  set orgId $startMsgIF1.orgExecutionId
6  set OpCompPUAbertoScene $startMsgIF1.sceneExecutionId
7  enterOrg $orgId
8  performRole $orgId comprador
9
10 IFB[{execIndex}]:
11 receive 0 startMsgIF2
12 enterOrg $orgId
13 performRole $orgId vendedor
14
15 #####
16 #####OpCompPUAberto#####
17 #####
18
19 IFA[{execIndex}]:
20 enterScene $orgId $OpCompPUAbertoScene comprador
21 msg SEL1054tp4CompraMsg cfp
22 set SEL1054tp4CompraMsg.orgExecutionId $orgId
23 set SEL1054tp4CompraMsg.sceneExecutionId $OpCompPUAbertoScene
24 set SEL1054tp4CompraMsg.sender IFA[{execIndex}]
25 set SEL1054tp4CompraMsg.senderRole comprador
26 set SEL1054tp4CompraMsg.receiver1 selic
27 set SEL1054tp4CompraMsg.receiverRole1 selic
28 set SEL1054tp4CompraMsg.CodMsg SEL1054
29 set SEL1054tp4CompraMsg.TpCompr 04
30 set SEL1054tp4CompraMsg.NOPRET "┐"
31 send $SEL1054tp4CompraMsg
32
33 IFB[{execIndex}]:
34 enterScene $orgId $OpCompPUAbertoScene vendedor
35 msg SEL1054tp4VendaMsg cfp
36 set SEL1054tp4VendaMsg.orgExecutionId $orgId
37 set SEL1054tp4VendaMsg.sceneExecutionId $OpCompPUAbertoScene
38 set SEL1054tp4VendaMsg.sender IFB[{execIndex}]
39 set SEL1054tp4VendaMsg.senderRole vendedor
40 set SEL1054tp4VendaMsg.receiver1 selic
41 set SEL1054tp4VendaMsg.receiverRole1 selic
42 set SEL1054tp4VendaMsg.CodMsg SEL1054
43 set SEL1054tp4VendaMsg.TpCompr 04
44 set SEL1054tp4VendaMsg.NOPRET "┐"
45 send $SEL1054tp4VendaMsg
46
47 IFA[{execIndex}]:
48 receive 180 SEL1054AguardandoVendaMsgRcvd

```

```
49 receive 180SEL1054R1CompraMsgRcvd
50 disconnect
51
52 IFB[{execIndex}]:
53 receive 0 SEL1054R1VendaMsgRcvd
54 disconnect
```

Listagem C.1: Script para Teste de Carga

D

Lei de Murphy

A primeira Lei de Murphy diz que:

Se há duas ou mais formas de fazer alguma coisa e uma das formas resultar em catástrofe, então alguém a fará.

Era, então, um princípio de design defensivo. Por exemplo, não faça uma ficha de dois pinos simétricos e ponha o rótulo “Este lado para cima”; se realmente importa o lado pelo qual ela deve ser ligada, então você deve criar um design assimétrico para que ele não possa ser ligado erroneamente.

Edward A. Murphy foi um dos engenheiros que trabalhavam nos experimentos de foguetes que estavam a ser feitos pela Força Aérea Americana (USAF), em 1949, através do projeto MX981, para testar a tolerância humana à aceleração.

Um experimento envolvia um conjunto de 16 acelerômetros montados em diferentes partes do corpo de uma pessoa-teste (uma “cobaia”). Havia duas formas pelas quais cada sensor podia ser colado em sua base e alguém instalou metodicamente todos os 16 de maneira errada. Murphy então realizou pela primeira vez esse pronunciamento. Tal pronunciamento foi citado pela pessoa-teste Major John Paul Stapp em uma conferência de imprensa alguns dias mais tarde.

Dentro de meses a Lei de Murphy tinha se espalhado por várias culturas técnicas ligadas à engenharia aeroespacial. Antes que se passassem alguns anos, muitas variações da lei foram criadas pela imaginação popular. A maioria dessas modificações são do tipo “Se alguma coisa pode dar errado ela vai dar errado”, ou “O pão sempre cai com a manteiga para baixo”. Algumas vezes é chamada de lei da trapaça.

Fonte: Wikipedia - http://pt.wikipedia.org/wiki/Lei_de_Murphy