

Corticon #3 Port Clearance (Consolidated Solution)

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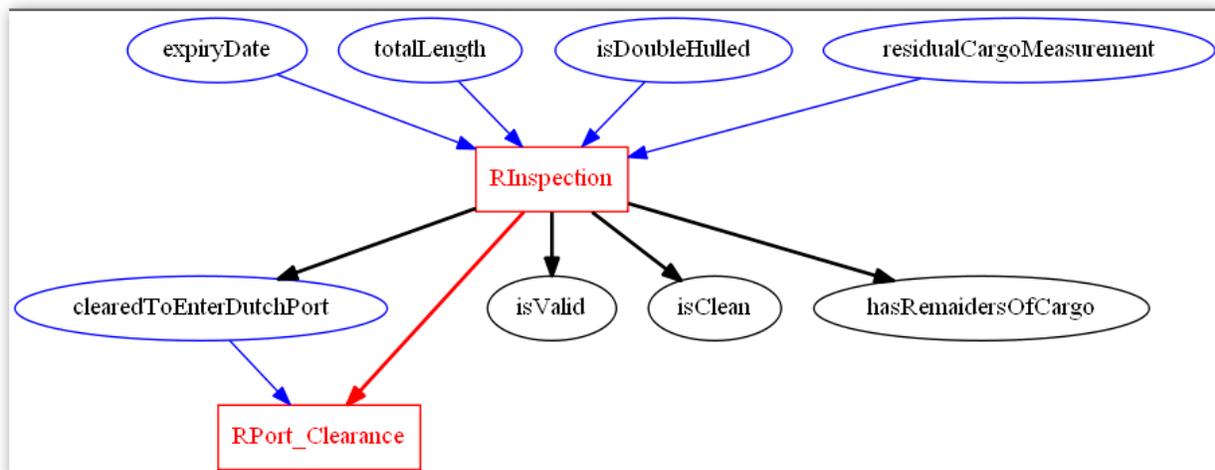
Consolidating the “As Specified” Decision model

We’ll discuss how the original model can be consolidated to make it smaller (this may or may not make it easier to maintain)

Consolidating the Rules

Note: It is possible to put all the rules in one sheet by testing the four attributes that are input to the decision. Effectively there are just five rules that implement the original ten rules.

Conditions	1	2	3	4	5
What's the total length of the ship	< 80	>= 80	>= 80	-	-
How much residual cargo does the hold have?	< 0.5	< 0.5	< 0.5	>= 0.5	-
Is the ship double hulled?	-	T	F	-	-
Does the ship have a valid certificate of registry?	T	T	-	-	F
Actions					
Post Message(s)	✉	✉	✉	✉	✉
The ship is cleared to enter a Dutch port	T	T	F	F	F
Remainders of Cargo	F	F	F	T	
Hold is clean	T	T	F	F	
Certificate is valid	T	T			F



Dealing with Bad data

Running the completeness checker will tell us that we do not have rules to deal with missing data

Conditions	1	2	3	4	5	6	7	8	9
What's the total length of the ship	< 80	>= 80	>= 80	-	-	null	-	>= 80	-
How much residual cargo does the hold have?	< 0.5	< 0.5	< 0.5	>= 0.5	-	-	null	-	-
Is the ship double hulled?	-	T	F	-	-	-	-	null	-
Does the ship have a valid certificate of registry?	> now	> now	-	-	<= now	-	-	-	null
Actions									
Post Message(s)	✉	✉	✉	✉	✉	✉	✉	✉	✉
The ship is cleared to enter a Dutch port	T	T	F	F	F				
Remainders of Cargo	F	F	F	T					
Hold is clean	T	T	F	F					
Certificate is valid	T	T			F				

We could also customize the rule statement messages:

Ref	Post	Alias	Text
			MAY ENTER A DUTCH PORT
1	Info	Ship	The ship is small since its length is less than 80 meters
2	Info	Ship	The ship is large since its length is at least 80 meters
1:2	Info	Ship	The ship's hold is clean since residual cargo is less than 0.5
1:2	Info	Ship	The ship has a certificate of registry that is valid because it has not yet expired
1:2	Info	Ship	The ship meets the safety requirement.
1:2	Info	Ship	The ship complies with the requirements of the Inspection for unloaded ships.
			MAY NOT ENTER A DUTCH PORT
3	Warning	Ship	The ship does not meet inspection requirements since it is large but not double hulled
4	Warning	Ship	The ship does not meet inspection requirements since it has residual cargo
5	Warning	Ship	The ship does not meet inspection requirements since it has an expired certificate
			INVALID DATA
6	Warning	Ship	Ship length is missing
7	Warning	Ship	Ship residual cargo measurement is missing
8	Warning	Ship	Ship isDouble Hulled is missing (required when ship is large)
9	Warning	Ship	Ship certificate date is missing

Input

- Ship [1] {data is missing}
 - certificateOfRegistry (CertificateOfRegistry) [1]
 - hold (Hold) [1]
- Ship [2] {data is missing}
 - totalLength [90.000000]
 - certificateOfRegistry (CertificateOfRegistry) [2]
 - hold (Hold) [2]

Output

- Ship [1] {data is missing}
 - certificateOfRegistry (CertificateOfRegistry) [1]
 - hold (Hold) [1]
- Ship [2] {data is missing}
 - totalLength [90.000000]
 - certificateOfRegistry (CertificateOfRegistry) [2]
 - hold (Hold) [2]

Properties Problems Error Log Search Rule Messages Natural Language Rule Statement

Severity	Message	Entity
Warning	[Inspection,6] Ship length is missing	Ship[1]
Warning	[Inspection,7] Ship residual cargo measurement is missing	Ship[1]
Warning	[Inspection,9] Ship certificate date is missing	Ship[1]
Warning	[Port_Clearance,3] It cannot be determined whether the ship may enter a Dutch port.	Ship[1]
Warning	[Inspection,7] Ship residual cargo measurement is missing	Ship[2]
Warning	[Inspection,8] Ship isDouble Hulled is missing (required when ship is large)	Ship[2]
Warning	[Inspection,9] Ship certificate date is missing	Ship[2]
Warning	[Port_Clearance,3] It cannot be determined whether the ship may enter a Dutch port.	Ship[2]

Appendix A The Rules (from RuleXpress)

1. Clean

***Statement** The hold of a ship must be considered clean if the hold does not contain remainders of cargo.

2. Clearance Dutch Port

***Statement** An unloaded ship may only enter a Dutch port if the ship complies with the requirements of the Inspection for unloaded ships.

3. Inspection requirements

***Statement** A ship must comply with the requirements of the Inspection for unloaded ships if the ship complies with all of the following:

- the ship meets the safety requirements for unloaded ships
- the ship has a certificate of registry that is valid.

4. Large ship

***Statement** A ship must be categorized as large if the total length of the ship is at least 80 meters.

5. Reminders of cargo

***Statement** A ship's hold contains remainders of cargo if the residual cargo measurement is higher than 0.5 mg dry weight per cm².

6. Safety requirements

***Statement** A ship only meets the safety requirements for unloaded ships if the ship complies with at least one of the following:

- the ship meets the safety requirements for small unloaded ships
- the ship meets the safety requirements for large unloaded ships.

7. Safety requirements large

***Statement** A ship only meets the safety requirements for large unloaded ships if the ship complies with all of the following:

- the ship is categorized as large
- the hold of the ship is clean
- the hold of the ship is double hulled.

8. Safety requirements small

***Statement** A ship only meets the safety requirements for small unloaded ships if the ship complies with all of the following:

- the ship is categorized as small
- the hold of the ship is clean.

9. Small ship

***Statement** A ship must be categorized as small if the total length of the ship is less than 80 meters.

10. Valid certificate of registry

***Statement** A ship's certificate of registry must be considered valid if the date up to which the registration is valid of the certificate of registry is after the current date.