

02291 System Integration

Introduction to DMN: Solutions to exercises

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Exercise 1

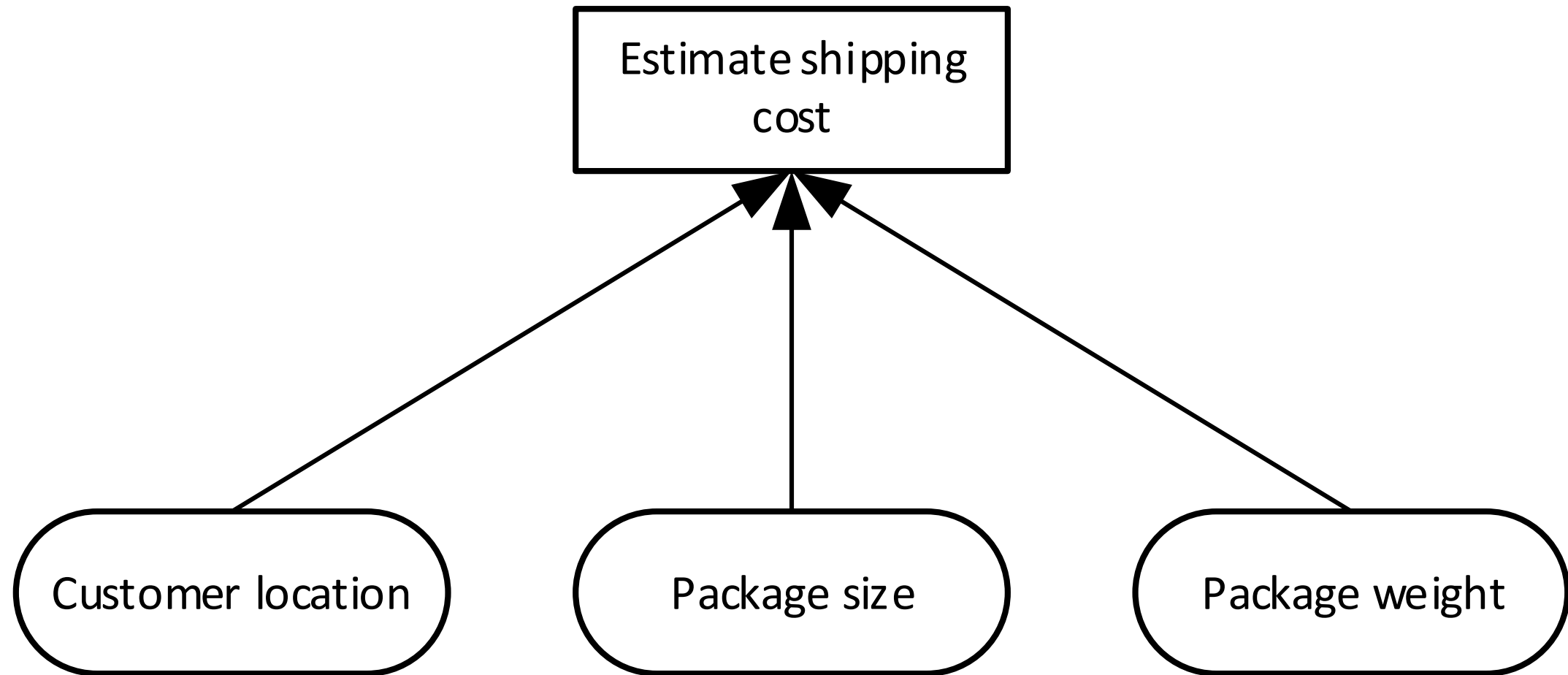
The decision task “Estimate shipping cost” of Example 3 is organized as it follows:

- If the customer is in EMEA, the weight of the package is lower than 10 Kg, and the volume of the package is smaller than 10 cm³, then the cost amounts to 100 DKK. Otherwise, the cost is 300 DKK.
- If the customer is in America or APAC, the weight of the package is lower than 5 Kg, and the volume of the package is smaller than 7 cm³, then the cost amounts to 200 DKK. If the weight of the package is greater than 20 Kg, and the volume of the package is bigger than 30 cm³, then the cost amounts to 2000 DKK. Otherwise, the cost amounts to 1000 DKK.

Implement this task with DMN:

- Draw the DMN diagram of this task
- Implement the decision with a decision table that uses the First (F) hit policy.
- Modify that decision table to use the Any (A) hit policy instead.
- Modify that decision table to use the Unique (U) hit policy instead.

Exercise 1 – DMN diagram



Exercise 1 – First decision table

Estimate shipping cost (F)	Customer location {EMEA, APAC, America}	Package weight [0,50]	Package volume [0,100]	Shipping cost [0,1000] 1000>0
1	EMEA	< 10	< 10	100
2	EMEA	-	-	300
3	-	< 5	< 7	200
4	-	> 20	> 30	2000
5	-	-	-	1000

Exercise 1 – Any decision table

Estimate shipping cost (A)	Customer location {EMEA, APAC, America}	Package weight [0,50]	Package volume [0,100]	Shipping cost [0,1000] 1000>0
1	EMEA	< 10	< 10	100
2	EMEA	>= 10	-	300
3	EMEA	-	>= 10	300
4	APAC	< 5	< 7	200
5	APAC	> 20	> 30	2000
6	APAC	>= 5	<= 30	1000
7	APAC	<= 20	>= 7	1000
8	America	< 5	< 7	200
9	America	> 20	> 30	2000
10	America	>= 5	<= 30	1000
11	America	<= 20	>= 7	1000

Exercise 1 – Unique decision table

Estimate shipping cost (U)	Customer location {EMEA, APAC, America}	Package weight [0,50]	Package volume [0,100]	Shipping cost [0,1000] 1000>0
1	EMEA	< 10	< 10	100
2	EMEA	>= 10	< 10	300
3	EMEA	< 10	>= 10	300
4	EMEA	>= 10	>= 10	300
5	APAC	< 5	< 7	200
6	APAC	> 20	> 30	2000
7	APAC	>= 5	<= 30	1000
8	APAC	<= 20	> 30	1000
9	APAC	< 5	[7,30]	1000
10	America	< 5	< 7	200
11	America	> 20	> 30	2000
12	America	>= 5	<= 30	1000
13	America	<= 20	> 30	1000
14	America	< 5	[7,30]	1000

Exercise 2

- Given the following decision table:

Determine discount (?)	Fidelity level {gold, silver, bronze}	Items bought [0,100]	Total value [0,100000]	Discount [0,30] 30>0
1	Gold	> 2	-	30
2	Gold	-	-	10
3	Silver	-	> 10000	20
4	Silver	> 2	-	10
5	Bronze	> 2	> 1000	10

- Which single hit policies would not cause any violation?
- Would all the previously identified hit policies lead to the same outcome?
- Is the table complete?

Exercise 2

- Given the following decision table:

Determine discount (?)	Fidelity level {gold, silver, bronze}	Items bought [0,100]	Total value [0,100000]	Discount [0,30] 30>0
1	Gold	> 2	-	30
2	Gold	-	-	10
3	Silver	-	> 10000	20
4	Silver	> 2	-	10
5	Bronze	> 2	> 1000	10

- Which single hit policies would not cause any violation? **First and Priority**
 - Rules 1 and 2, 3 and 4 could hold simultaneously (thus violating Unique) and would give different results (thus violating Any)

Exercise 2

- Given the following decision table:

Determine discount (?)	Fidelity level {gold, silver, bronze}	Items bought [0,100]	Total value [0,100000]	Discount [0,30] 30>0
1	Gold	> 2	-	30
2	Gold	-	-	10
3	Silver	-	> 10000	20
4	Silver	> 2	-	10
5	Bronze	> 2	> 1000	10

- Would all the previously identified hit policies lead to the same outcome? **Yes**
 - When 1 and 2 hold, First would select 1, giving 30% discount. Priority would also select 1 since 10 has lower priority than 30 (i.e., $10 < 30$).
 - When 3 and 4 hold, First would select 3, giving 20% discount. Priority would Priority would also select 3 since 10 has lower priority than 20 (i.e., $10 < 20$).

Exercise 2

- Given the following decision table:

Determine discount (?)	Fidelity level {gold, silver, bronze}	Items bought [0,100]	Total value [0,100000]	Discount [0,30] 30>0
1	Gold	> 2	-	30
2	Gold	-	-	10
3	Silver	-	> 10000	20
4	Silver	> 2	-	10
5	Bronze	> 2	> 1000	10

- Is the table complete? **No**
 - Discount is not specified for Silver customers with 2 or less items bought and 10000 DKK or less total value.
 - Discount is not specified for Bronze customers with 2 or less items bought or 1000 DKK or less total value.