Decision Rules

The questionnaire contains 4 sections. Section 1 contains two general questions and a brief description of decision mining. Section 2-4, each contains a decision mining use case and three decision rule versions for each use case.

1. Which domain are you working in?

2. Do you have experience with process mining?

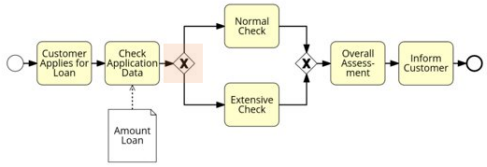
   Markieren Sie nur ein Oval.

   - ( ) No
   - ( ) Yes, 5 years or less
   - ( ) Yes, longer than 5 years
   - ( ) Sonstiges: _____

What is Decision Mining?

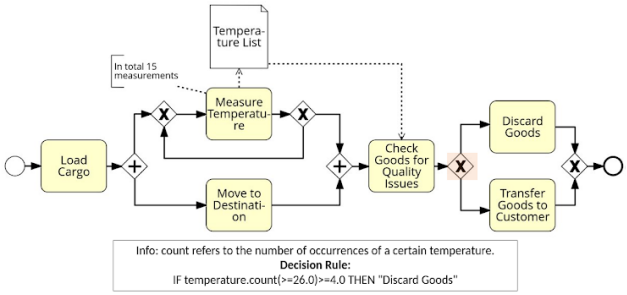
- Decision Mining is about analyzing decision points and the corresponding decision rules
- Using available data elements e.g., from the event log
- Example of a decision rule for the highlighted decision point:

Decision Rule
„IF Amount Loan <= 80.000 THEN Normal Check ELSE Extensive Check"



Section 2/4: Logistics Process - Temperature Measurement

Decision Rule Version 1/3



Definitions of used terms

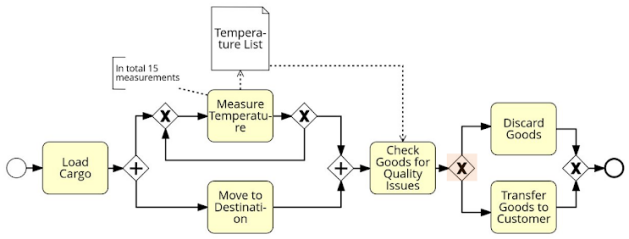
understandable - the decision rule as a whole is easy to comprehend
interpretable - the names of the data element used in the rules are easy to comprehend
concise - the decision rule is presented without including redundant or unnecessary information
complete - all necessary data elements are part of the rule and all possible cases are covered
consistent - there are no contradictions in the decision rule
useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

3. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

Decision Rule Version 2/3



Info: Temperature List is split into 5 intervals, for each interval maximum is calculated.
Decision Rule:
IF temperature_intervall1_max > 25.5 AND temperature_intervall2_max > 25.5 AND temperature_intervall4_max > 25.5 THEN "Discard Goods"

Definitions of used terms (repeated for ease of use)

understandable - the decision rule as a whole is easy to comprehend
interpretable - the names of the data element used in the rules are easy to comprehend
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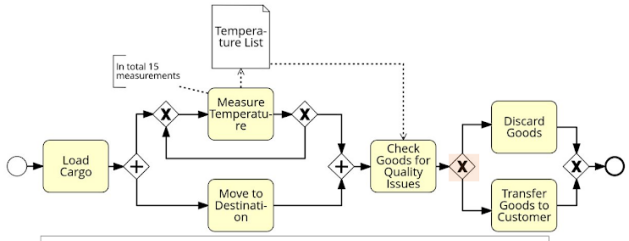
4. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

Decision Rule Version 3/3



Info: temperature_quantile refers to the x percent quantile of measurements, temperature_change_quantiles refers to the change in the standard variation btw the different quantiles.
Decision Rule:
IF temperature__quantile__q_0.8 > 25.90 AND temperature__change_quantiles__f_agg_"var"__isabs_True__qh_1.0__ql_0.6 <= 27.67 THEN "Discard Goods"

Definitions of used terms (repeated for ease of use)
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useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

5. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

6. Which of the presented rules (Rule Version 1-3) for this scenario is the most useful decision rule for the presented scenario? And why?

Info: count refers to the number of occurrences of a certain temperature.
Decision Rule Version 1:
IF temperature.count(>=26.0)>=4.0 THEN "Discard Goods"

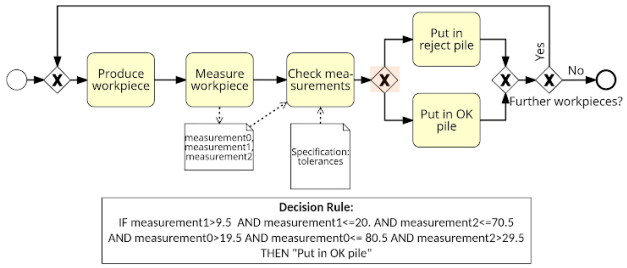
Info: Temperature List is split into 5 intervals, for each interval maximum is calculated.
Decision Rule Version 2:
IF temperature_intervall1_max > 25.5 AND temperature_intervall2_max > 25.5 AND temperature_intervall4_max > 25.5 THEN "Discard Goods"

Info: temperature_quantile refers to the x percent quantile of measurements, temperature_change_quantiles refers to the change in the standard variation btw the different quantiles.
Decision Rule Version 3:
IF temperature__quantile__q_0.8 > 25.90 AND temperature__change_quantiles__f_agg_"var"__isabs_True__qh_1.0__ql_0.6 <= 27.67 THEN "Discard Goods"

7. Any Comments?

Section 3/4: Manufacturing Process - Quality Control

Decision Rule Version 1/3



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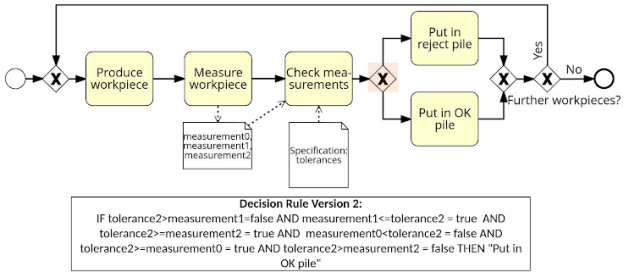
consistent - there are no contradictions in the decision rule
useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

8. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

Decision Rule Version 2/3



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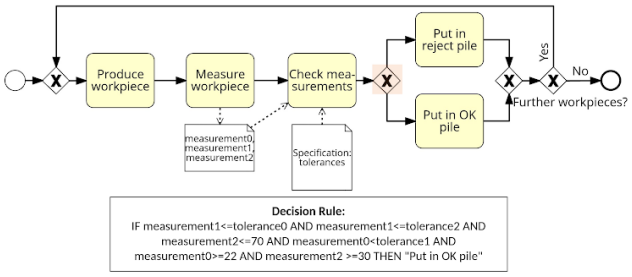
useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

9. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

Decision Rule Version 3/3



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useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

10. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

11. Which of the presented rules (Rule Version 1-3) for this scenario is the most useful decision rule for the presented scenario? And why?

Decision Rule Version 1:
IF measurement1>9.5 AND measurement1<=20. AND measurement2<=70.5 AND measurement0>19.5 AND measurement0<= 80.5 AND measurement2>29.5 THEN "Put in OK pile"

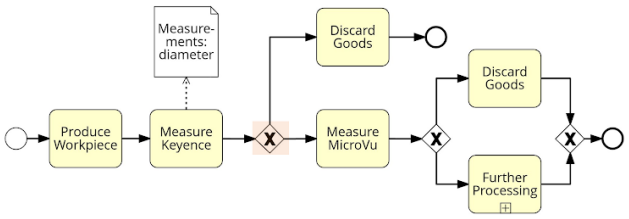
Decision Rule Version 2:
IF tolerance2>measurement1=false AND measurement1<=tolerance2 = true AND tolerance2>=measurement2 = true AND measurement0<tolerance2 = false AND tolerance2>=measurement0 = true AND tolerance2>measurement2 = false THEN "Put in OK pile"

Decision Rule Version 3:
IF measurement1<=tolerance0 AND measurement1<=tolerance2 AND measurement2<=70 AND measurement0<tolerance1 AND measurement0>=22 AND measurement2 >=30 THEN "Put in OK pile"

12. Any Comments?

Section 4/4: Manufacturing Process - Quality Control II

Decision Rule Version 1/3



Info: Diameter Measurements split into 10 intervals.
Decision Rule:
IF diameter_intervall2_percentchange > 0.16 THEN "Discard Goods"

Definitions of used terms (repeated for ease of use)
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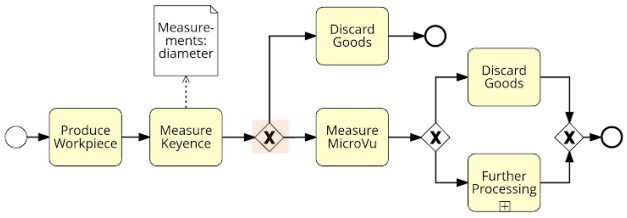
interpretable - the names of the data element used in the rules are easy to comprehend
concise - the decision rule is presented without including redundant or unnecessary information
complete - all necessary data elements are part of the rule and all possible cases are covered
consistent - there are no contradictions in the decision rule
useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

13. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

Decision Rule Version 2/3



Info: casename is the instance identifier, diameter.last is the last measurement.
Decision Rule:
IF casename<= 2242.5 AND casename<= 2179 AND casename<= 1932.5 AND diameter.last<= 27.25 THEN "Discard Goods"

Definitions of used terms (repeated for ease of use)

understandable - the decision rule as a whole is easy to comprehend
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concise - the decision rule is presented without including redundant or unnecessary information
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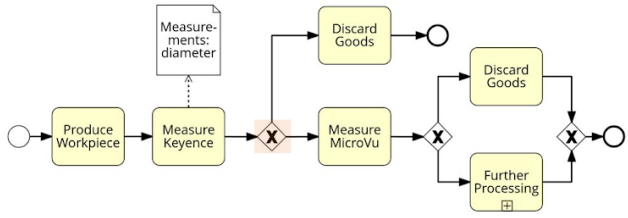
consistent - there are no contradictions in the decision rule
useful - the rule is applicable and relevant for the use case
credible - the decision rule is plausible - it does the job intended by the process designer

14. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?					
Interpretable?					
Concise?					
Complete?					
Consistent?					
Useful?					
Credible?					

Decision Rule Version 3/3



Info: count refers to the number of occurrences of a specific diameter.
Decision Rule:
IF diameter.count(>=38.28)>=3.0 AND diameter.count(>=39.78)>=4.0 AND diameter.count(>=39.8)>=4.0 == False THEN "Discard Goods"

Definitions of used terms (repeated for ease of use)

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15. Rate each statement from 1 (I strongly disagree) to 5 (I strongly agree). The stated decision rule is...

Markieren Sie nur ein Oval pro Zeile.

	1 (strongly disagree)	2	3	4	5 (strongly agree)
Understandable?	◯	◯	◯	◯	◯
Interpretable?	◯	◯	◯	◯	◯
Concise?	◯	◯	◯	◯	◯
Complete?	◯	◯	◯	◯	◯
Consistent?	◯	◯	◯	◯	◯
Useful?	◯	◯	◯	◯	◯
Credible?	◯	◯	◯	◯	◯

16. Which of the presented rules (Rule Version 1-3) for this scenario is the most useful decision rule for the presented scenario? And why?

Info: Diameter Measurements split into 10 intervals.
Decision Rule Version 1:
IF diameter_intervall2_percentchange > 0.16 THEN "Discard Goods"

Info: casename is the instance identifier, diameter.last is the last measurement.
Decision Rule Version 2:
IF casename<= 2242.5 AND casename<= 2179 AND casename<= 1932.5 AND diameter.last<= 27.25 THEN "Discard Goods"

Info: count refers to the number of occurrences of a specific diameter.
Decision Rule Version 3:
IF diameter.count(>=38.28)>=3.0 AND diameter.count(>=39.78)>=4.0 AND diameter.count(>=39.8)>=4.0 == False THEN "Discard Goods"

17. Any Comments?