Borrowing Decision with Mitigation Criteria

Decision Management Challenge October 2014

A solution created in Oracle Policy Automation

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Introduction

The following solution to the Decision Management Challenge October 2014 consists of executable rules created in Oracle Policy Automation. The rules as you see them are executable and are accomponied by a testreport that shows the outcomes of the given testcases for ABC Bank and Bank One.

The rules are changed to show how easy changes can be made to adapt to changing business rules. The author does not have extensive financial knowledge and begs the knowledgable reader's pardon for a change that may not seem a very sensible one.

The rules can be deployed in a website with automatic screen generation (included in this report) or with screens tailored to the customer's needs or as a determination server handling milions of transactions conforming to very competitive performance. The rules can also be deployed as a webservice or integrated in any other platform such as Oracle Fusion or RightNow.

This solution has been created in exactly 2 hours and 11 minutes including testing and formatting this report.

Initial Rules

Decision Rule

the transaction passes if

the transaction passes rule #1
and
the transaction passes rule #2

Substantial rules

Rule #1New Borrowings cannot exceed 30% of Total Assets

the transaction passes rule #1 if

the new borrowings do not exceed 30% of total assets
or
the transaction satisfies the mitigation criteria for rule #1

the transaction satisfies the mitigation criteria for rule #1 if

the executive committee flag = "Y"
and
the executive committee exposure override is set to a percentage higher than the new borrowings/total assets ratio

Rule #2New Borrowings cannot exceed 1-4 Threshold

the transaction passes rule #2 if

the new borrowings do not exceed the 1-4 threshold
or
the transaction satisfies the mitigation criteria for rule #2

the transaction satisfies the mitigation criteria for rule #2 if

the new borrowings is less than the non-repo collateral available for the customer

Interpretation rules

the new borrowings exceed 30% of total assets if

the new borrowings / the total assets > 0.3

the new borrowings exceed the 1-4 threshold if

the new borrowings > the 1-4 threshold

the executive committee exposure override is set to a percentage higher than the new borrowings/total assets ratio

the executive committee exposure override > the new borrowings / the total assets

the new borrowings is less than the non-repo collateral available for the customer

the new borrowings < the non-repo collateral

Changed Rules

Decision Rule

the transaction passes if

the transaction passes rule #1
and
the transaction passes rule #2

Substantial rules

Rule #1New Borrowings cannot exceed 30% of Total Assets

the transaction passes rule #1 if

the new borrowings do not exceed 30% of total assets
or
the transaction satisfies the mitigation criteria for rule #1

the transaction satisfies the mitigation criteria for rule #1 if

the executive committee flag = "Y"
and
the executive committee exposure override is set to a percentage higher than the new borrowings/total assets ratio

Rule #2New Borrowings cannot exceed 1-4 Threshold

the transaction passes rule #2 if

the new borrowings do not exceed the 1-4 threshold
or
the transaction satisfies the mitigation criteria for rule #2

Following rule has been changed by adding a condition to the mitigation criteria

the transaction satisfies the mitigation criteria for rule #2 if

the new borrowings is less than the non-repo collateral available for the customer
or
both

> the new borrowings do not exceed twice the non-repo collateral
> and
> the non-repo collateral constitutes only government bonds

Interpretation rules

the new borrowings exceed 30% of total assets if

the new borrowings / the total assets > 0.3

the new borrowings exceed the 1-4 threshold if

the new borrowings > the 1-4 threshold

the executive committee exposure override is set to a percentage higher than the new borrowings/total assets ratio

the executive committee exposure override > the new borrowings / the total assets

the new borrowings is less than the non-repo collateral available for the customer

the new borrowings < the non-repo collateral

Following rule has been added to support the change in the second rule

the new borrowings exceed twice the non-repo collateral if

the new borrowings / the non-repo collateral > 2

Testcases

Initial Rules

All testcases perform as expected.

Summary

Test cases		Attributes	
Number of test cases:	4	**Number of outcomes:**	4 (**4** significant)
Test cases passed:	4 (100%)	**Matching outcomes:**	**4** (100% of total). Of these, **4** (100 % of matching) matched exactly and **0** (0 % of matching) matched after allowance for defined thresholds.
Test cases failed:	0 (0%)	**Different outcomes:**	0 (0%)
Test cases ignored:	0 (0%)	**Ignored outcomes:**	0 (0%)
Test cases with errors:	0 (0%)		

Test case comparison results

Cases	Entities	Outcomes	Expected	Actual
Case FAIL Customer ABC Bank Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	the transaction passes	False	False
Case PASS Customer ABC Bank Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	the transaction passes	True	True
Case FAIL Customer Bank One Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	the transaction passes	False	False
Case PASS Customer Bank One Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	the transaction passes	False	False

Changed Rules

Under the changed rules the transaction that earlier failed do now pass. The changed outcomes are red because the expected results have deliberately not been changed to highlight the change.

Summary

Test cases		Attributes	
Number of test cases:	4	**Number of outcomes:**	4 (**4** significant)
Test cases passed:	1 (25%)	**Matching outcomes:**	**1** (25% of total). Of these, **1** (100 % of matching) matched exactly and **0** (0 % of matching) matched after allowance for defined thresholds.
Test cases failed:	3 (75%)	**Different outcomes:**	3 (75%)
Test cases ignored:	0 (0%)	**Ignored outcomes:**	0 (0%)
Test cases with errors:	0 (0%)		

Test case comparison results

Cases	Entities	Outcomes	Expected	Actual
Case FAIL Customer ABC Bank Fail (1 out of 1 items)	global[global 1]	the transaction passes	**False**	**True**
Case PASS Customer ABC Bank Pass (1 exact, 0 threshold and 0 ignored)	global[global 1]	the transaction passes	True	True
Case FAIL Customer Bank One Fail (1 out of 1 items)	global[global 1]	the transaction passes	**False**	**True**
Case PASS Customer Bank One	global[global 1]	the transaction passes	**False**	**True**

Testcase data example

Case FAIL Customer ABC Bank

Below testcase data show the case for ABC Bank with the new borrowings set to 5,000,000.

Under the initial rules this case failed rule #2 as the new borrowings exceed the 1-4 threshold and the transaction does not satisfy the mitigation criteria for rule #2.

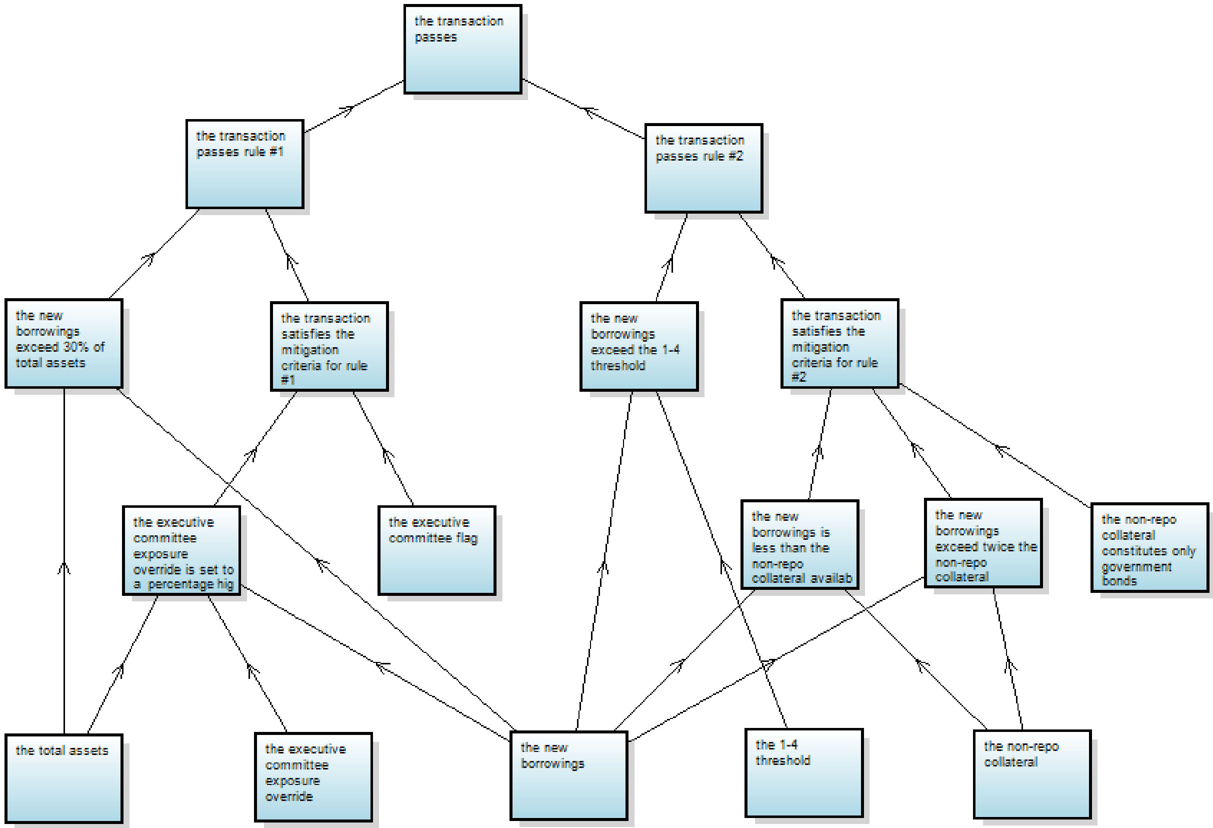
Under the changed rules however the transaction passes. The explanation in the form of an inference tree is shown below.

Name	Value	Text
Base Attributes:		
total_assets	20000000.0	The total assets are $20,000,000.00.
executive_committee_flag	Y	The executive committee flag is Y.
executive_committee_exposure_ov...	0.35	The executive committee exposure override is 0.35.
threshold1_4	1000000.0	The 1-4 threshold is $1,000,000.00.
non_repo_collateral	2500000.0	The non-repo collateral is $2,500,000.00.
new_borrowings	5000000.0	The new borrowings are $5,000,000.00.
b4@Properties_Properties_xsrc	True	The non-repo collateral constitutes only government bonds.
Inferrable Attributes:		
new_borrowings_exceed_30_of_to...	False	The new borrowings do not exceed 30% of total assets.
new_borrowings_exceed_1_4_thre...	True	The new borrowings exceed the 1-4 threshold.
transaction_passes	True [False]	The transaction passes.
b2@Rules_Rules_doc	True	The transaction passes rule #1.
b3@Rules_Rules_doc	True	The transaction passes rule #2.
b5@Rules_Rules_doc	True	The transaction satisfies the mitigation criteria for rule #1.
b6@Rules_Rules_doc	True	The executive committee exposure override is set to a percentage higher than the new borrowings/total assets ratio.
b8@Rules_Rules_doc	True	The transaction satisfies the mitigation criteria for rule #2.
b9@Rules_Rules_doc	False	The new borrowings is not less than the non-repo collateral available for the customer.
b10@Rules_Rules_doc	False	The new borrowings do not exceed twice the non-repo collateral.

- The transaction passes.
  - The transaction passes rule #1.
    - The new borrowings do not exceed 30% of total assets.
      - The new borrowings are $5,000,000.00.
      - The total assets are $20,000,000.00.
    - The transaction satisfies the mitigation criteria for rule #1.
      - The executive committee flag is Y.
      - The executive committee exposure override is set to a percentage higher than the new borrowings/total assets ratio.
        - The executive committee exposure override is 0.35.
        - The new borrowings are $5,000,000.00.
        - The total assets are $20,000,000.00.
  - The transaction passes rule #2.
    - The transaction satisfies the mitigation criteria for rule #2.
      - The new borrowings do not exceed twice the non-repo collateral.
        - The new borrowings are $5,000,000.00.
        - The non-repo collateral is $2,500,000.00.
      - The non-repo collateral constitutes only government bonds.

Decision model

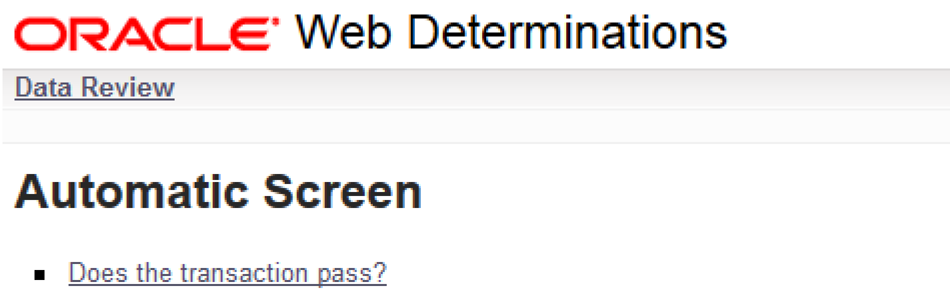
The complete rule structure can be visualized as a decision model. The changed rules have been visualized in the image below.



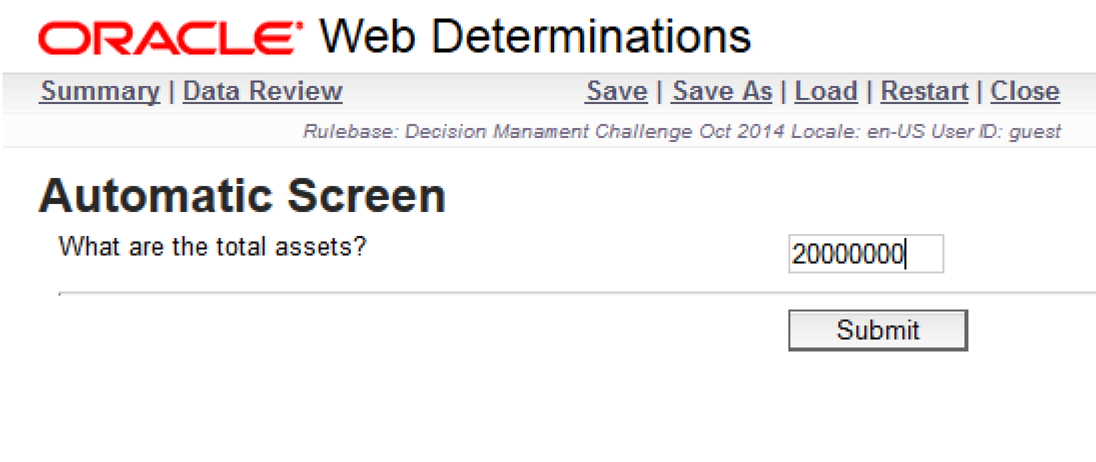
The solution in OPA Webdeterminations

Below are the screens that are automatically generated by OPA Webdeterminations and shows how each testcase can also be executed through a webinterface.

Initial screen showing the decision to be made:



Then several screens follow to enter the data needed to make the decision. (not all screens are included here)



After all data has been submitted the result is shown as follows: