

AB-SD Hybrid Model: Strategic Planning, Crisis & Cooptation

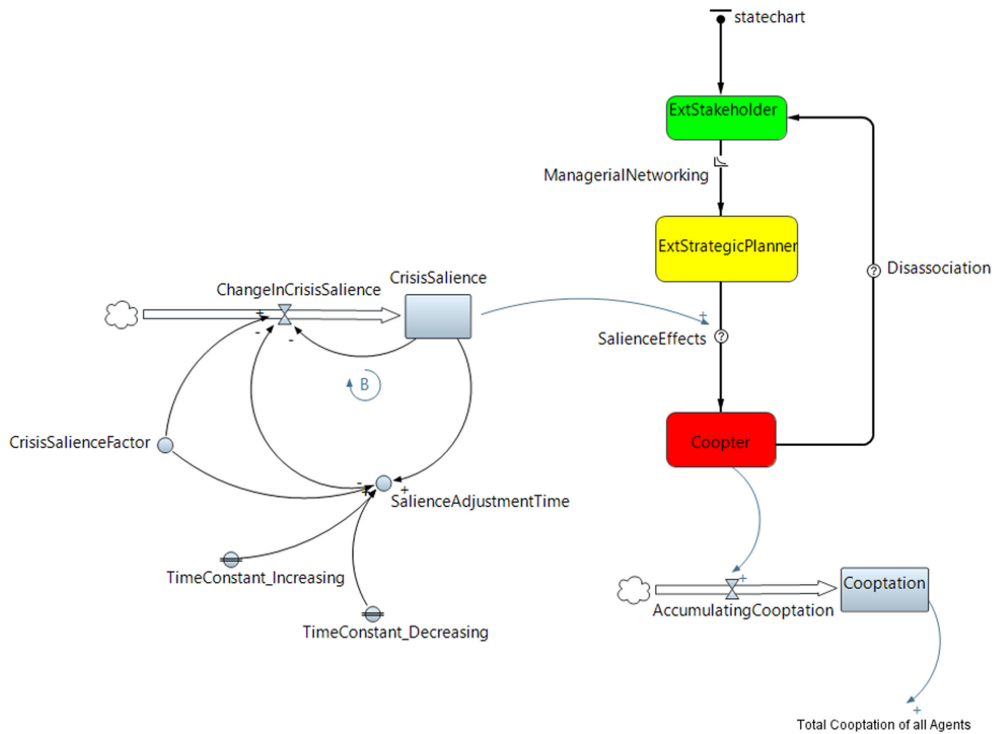
| Name | Value |
|-------------------------------|-----------------|
| General | |
| Model time units | months |
| Numerical methods | |
| Differential Equations Method | Euler |
| Algebraic Equations Method | Modified Newton |
| Mixed Equations Method | RK45+Newton |
| Absolute accuracy | 1.0E-5 |
| Time accuracy | 1.0E-5 |
| Relative accuracy | 1.0E-5 |
| Fixed time step | 0.001 |

Agent Type: ExternalStakeholder

| Name | Value |
|--|------------|
| Agent in flowcharts | |
| Use in flowcharts as | Agent |
| Dimensions and movement | |
| Speed | (10: MPS) |
| Rotate animation towards movement | true |
| Rotate vertically as well (along Z-axis) | true |
| Space and network | |
| Space Type | Continuous |
| Advanced Java | |
| Generic | false |

Parameter: CrisisSalienceFactor

| Name | Value |
|-----------------------|-------------------------|
| General | |
| Array | false |
| Default value | triangular (0, 100, 20) |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Text |
| Advanced | |
| Name | Value |
| System dynamics units | false |
| Save in snapshot | true |



State chart for the strategic planning practice/external networking AB submodel

Stock: CrisisSaliency

| Name | Value |
|-----------------------|---|
| General | |
| Equation mode | Classic |
| Initial value | 0 |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |
| Description | |
| Description | Saliency of crises: initially, 0 (no crises in memory). |

Description: Saliency of crises: initially, 0 (no crises in memory).

Dynamic Variable: SalienceAdjustmentTime

| Name | Value |
|-----------------------|--|
| General | |
| Formula | CrisisSalienceFactor >= CrisisSalience ? TimeConstant_Increasing : TimeConstant_Decreasing |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Dynamic Variable: TimeConstant_Decreasing

| Name | Value |
|-----------------------|--|
| General | |
| Value | 9 |
| Constant | true |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |
| Description | |
| Description | Time constant governing adjustment when output is decreasing |

Description: Time constant governing adjustment when output is decreasing

Dynamic Variable: CrisisSalienceFactor

| Name | Value |
|-----------------------|--------------------------|
| General | |
| Formula | main.fiscalResilienceGap |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Dynamic Variable: TimeConstant_Increasing

| Name | Value |
|---------|-------|
| General | |
| Value | 3 |

Dynamic Variable: TimeConstant_Increasing

| Name | Value |
|-----------------------|---|
| General | |
| Constant | true |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |
| Description | |
| Description | Time constant that characterizes the adjustment when the output is increasing (when delay X exceeds or equals the output X'). |

Flow: ChangeInCrisisSalience

| Name | Value |
|-----------------------|---|
| General | |
| Formula | $(\text{CrisisSalienceFactor} - \text{CrisisSalience}) / \text{SalienceAdjustmentTime}$ |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Stock: Cooptation

| Name | Value |
|-----------------------|---------|
| General | |
| Equation mode | Classic |
| Initial value | 0 |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Flow: AccumulatingCooptation

| Name | Value |
|-----------------------|--------------------------------|
| General | |
| Formula | inState(Coopter) ? 10 : 0 |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Statechart Entry Point: statechart

| Name | Value |
|-----------------|-------|
| General | |
| Logging | true |
| Show at runtime | true |
| Show name | true |

Transition: ManagerialNetworking

| Name | Value |
|--------------|------------------------------------|
| General | |
| Rate | (main.NetworkingIndex : PER_MONTH) |
| Trigger type | Rate |
| Show name | true |

Transition: SalienceEffects

| Name | Value |
|--------------|---------------------|
| General | |
| Condition | CrisisSalience > 40 |
| Trigger type | Condition |
| Show name | true |

Transition: Disassociation

| Name | Value |
|--------------|---------------------|
| General | |
| Condition | CrisisSalience < 60 |
| Trigger type | Condition |
| Show name | true |

State: ExtStakeholder

| Name | Value |
|--------------|---------------------------------|
| General | |
| Exit action | |
| Entry action | shapeBody.setFill-color(yellow) |
| Fill color | white |
| Show name | true |

State: ExtStrategicPlanner

| Name | Value |
|--------------|--------------------------------|
| General | |
| Entry action | shapeBody.setFill-color(lime); |
| Fill color | white |
| Show name | true |

State: Coopter

| Name | Value |
|--------------|-------------------------------|
| General | |
| Exit action | Cooptation = 0; |
| Entry action | shapeBody.setFill-color(red); |
| Fill color | white |
| Show name | true |

Data Set: CooptationDS

| Name | Value |
|---------------------------------|------------------------------|
| General | |
| Dataset Samples To Keep | 500 |
| Axis Data Vertical Y Axis | Cooptation |
| Axis Data Freeze X Axis | true |
| Show at runtime | true |
| Show name | true |
| Data update | |
| Analysis auto update | true |
| ANALYSIS_UPDATE_TIME_PROPERTIES | - Recurring Event Properties |
| Logging | true |

Data Set: CrisisSalienceDS

| Name | Value |
|---------------------------------|------------------------------|
| General | |
| Dataset Samples To Keep | 500 |
| Axis Data Vertical Y Axis | CrisisSalience |
| Axis Data Freeze X Axis | true |
| Show at runtime | true |
| Show name | true |
| Data update | |
| Analysis auto update | true |
| ANALYSIS_UPDATE_TIME_PROPERTIES | - Recurring Event Properties |
| Logging | true |

Group: person

| Name | Value |
|-------------------|---------|
| General | |
| Show at runtime | true |
| Lock | false |
| Embedded icon | false |
| Public | true |
| Position and size | |
| x | 0.0 |
| y | 0.0 |
| z | 0.0 |
| Rotation | 0.0 |
| Advanced | |
| Show in | 2D only |
| Show name | false |

Curve: shapeBody

| Name | Value |
|--------------------------------------|-------|
| General | |
| Polyline closed | true |
| Show at runtime | true |
| Lock | false |
| Public | true |
| Appearance | |
| Fill color | black |
| Line width | 1.0 |
| Line style | SOLID |
| Position and size | |
| x | -2.0 |
| y | -7.0 |
| Advanced | |
| Control points are set automatically | true |
| Show name | false |

Link to agents: connections

| Name | Value |
|--|------------|
| General | |
| Show at runtime | true |
| Show name | true |
| Communication | |
| Message type | Object |
| Animation | |
| Draw line | false |
| Agent Type: Main | |
| Name | Value |
| Use in flowcharts as | Agent |
| Dimensions and movement | |
| Speed | (10 : MPS) |
| Rotate animation towards movement | true |
| Rotate vertically as well (along Z-axis) | false |
| Space and network | |
| Space Type | Continuous |
| Dynamic: Width | 500 |
| Dynamic: Height | 500 |
| Dynamic: z Height | 0 |
| Layout Type | Random |
| Layout Type Apply On Startup | true |
| Network type | Random |
| Network Type Apply On Startup | true |
| Connections per agent | 2 |
| Enable steps | false |
| Advanced Java | |
| Generic | false |

Parameter: TimeForStrategicInterventions

| Name | Value |
|--------------------------------|--------|
| General | |
| Array | false |
| Default value | 12 |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Slider |
| Parameter Editor Minimum Value | 0 |
| Parameter Editor Maximum Value | 60 |
| Advanced | |
| System dynamics units | true |
| Unit | months |
| Save in snapshot | true |

Parameter: StartingFiscalResilience

| Name | Value |
|--------------------------------|--------|
| General | |
| Array | false |
| Default value | 50 |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Slider |
| Parameter Editor Minimum Value | 0 |
| Parameter Editor Maximum Value | 100 |

Parameter: TimeForPlanningGoal

| Name | Value |
|--------------------------------|--------|
| General | |
| Array | false |
| Default value | 1 |
| Name | Value |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Slider |
| Parameter Editor Minimum Value | 0 |
| Parameter Editor Maximum Value | 60 |

Parameter: InitialStrategicGoal

| Name | Value |
|--------------------------------|--------|
| General | |
| Array | false |
| Default value | 150 |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Slider |
| Parameter Editor Minimum Value | 0 |
| Parameter Editor Maximum Value | 100 |
| Advanced | |
| System dynamics units | true |
| Unit | dmls |
| Save in snapshot | true |

Parameter: NetworkingIndex

| Name | Value |
|-----------------------|--------------------|
| General | |
| Array | false |
| Default value | normal(3.28, 0.94) |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Text |
| Advanced | |
| System dynamics units | false |
| Save in snapshot | true |

Parameter: DisassociationRate

| Name | Value |
|-----------------------|--------------------|
| General | |
| Array | false |
| Default value | triangular(1,10,3) |
| Type | double |
| Show at runtime | true |
| Show name | true |
| Value editor | |
| Editor control | Text |
| Advanced | |
| System dynamics units | false |
| Save in snapshot | true |

Function: fiscalResilienceLevel

| Name | Value |
|-----------------------|--------------------------------|
| General | |
| Return type | double |
| Return type: | Returns value |
| Show at runtime | true |
| Show name | true |
| Function body | |
| Body | return fiscalResilienceOutput; |
| Advanced | |
| Access type | default |
| System dynamics units | false |

Table Function: tableFunction

| Name | Value |
|-----------------------|-------------|
| General | |
| Out of range behavior | Extrapolate |
| Interpolation | Linear |
| Show at runtime | true |
| Show name | true |
| Table data | |
| Load From Database | false |
| Advanced | |
| Access type | public |
| System dynamics units | false |

Table Data:

| Argument | Value |
|----------|-------|
| -5.0 | 132.0 |
| -4.0 | 138.0 |
| -3.0 | 142.0 |
| -2.0 | 148.0 |
| -1.0 | 150.0 |
| 0.0 | 145.0 |
| 1.0 | 135.0 |
| 2.0 | 125.0 |
| 3.0 | 115.0 |

Table Data:

| Argument | Value |
|----------|-------|
| 4.0 | 100.0 |
| 5.0 | 95.0 |
| 6.0 | 85.0 |

Table Function: tableFunction2

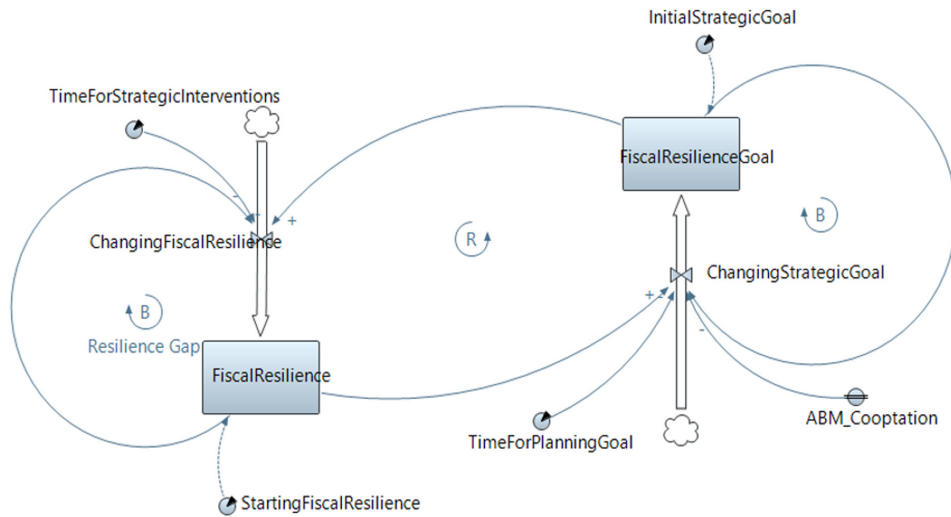
| Name | Value |
|-----------------------|---------------------------------|
| General | |
| Out of range behavior | Extrapolate |
| Interpolation | Linear |
| Show at runtime | true |
| Show name | true |
| Table data | |
| Load From Database | true |
| Values Query | - Database Table Function Query |
| Advanced | |
| Access type | public |
| System dynamics units | false |

Table Data:

| Argument | Value |
|----------|-------|
| -5.0 | 132.0 |
| -4.0 | 138.0 |
| -3.0 | 142.0 |
| -2.0 | 148.0 |
| -1.0 | 150.0 |
| 0.0 | 145.0 |
| 1.0 | 135.0 |
| 2.0 | 125.0 |
| 3.0 | 115.0 |
| 4.0 | 100.0 |
| 5.0 | 95.0 |
| 6.0 | 85.0 |

Event: UpdateABM_Cooptation

| Name | Value |
|--------------------------|---|
| General | |
| Logging | true |
| EVENT_TIMEOUT_PROPERTIES | - Recurring Event Properties |
| Mode | Cyclic |
| Trigger type | Timeout |
| Show at runtime | false |
| Show name | true |
| Action | |
| Action | ABM_Cooptation = externalStakeholders.NumberCooptation(); |



Stock-and-flow diagram for the organizational-level performance SD submodel

Flow: *ChangingFiscalResilience*

| Name | Value |
|-----------------------|--|
| General | |
| Formula | $(\text{FiscalResilienceGoal} - \text{FiscalResilience}) / \text{TimeForStrategicInterventions}$ |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | true |
| Unit | dmls/months |
| Description | |
| Description | The net inflow a fraction of the discrepancy between the desired and actual state each period. The adjustment time determines what fraction of the gap is corrected each period. |

Stock: FiscalResilienceGoal

| Name | Value |
|-----------------------|---|
| General | |
| Equation mode | Classic |
| Initial value | InitialStrategicGoal |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | true |
| Unit | dmls/months |
| Description | |
| Description | The memory of crises. Initially 0 (no crises in memory) |

Flow: ChangingStrategicGoal

| Name | Value |
|-----------------------|--|
| General | |
| Formula | $((\text{FiscalResilience} - \text{FiscalResilienceGoal}) * (\text{ABM_Cooptation} / \text{externalStakeholders.size()})) / \text{TimeForPlanningGoal}$ |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Stock: FiscalResilience

| Name | Value |
|-----------------------|--|
| General | |
| Equation mode | Classic |
| Initial value | StartingFiscalResilience |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | true |
| Unit | dmls |
| Description | |
| Description | The state of the system accumulates its net inflow rate. |

Dynamic Variable: ABM_Cooptation

| Name | Value |
|-----------------------|-------|
| General | |
| Value | 0 |
| Constant | true |
| Name | Value |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Flow: ChangingFiscalResilience

| Name | Value |
|-----------------------|--|
| General | |
| Formula | $(\text{FiscalResilienceGoal} - \text{FiscalResilience}) / \text{TimeForStrategicInterventions}$ |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | true |
| Unit | dmls/months |
| Description | |
| Description | The net inflow a fraction of the discrepancy between the desired and actual state each period. The adjustment time determines what fraction of the gap is corrected each period. |

Flow: ChangingStrategicGoal

| Name | Value |
|-----------------------|--|
| General | |
| Formula | $((\text{FiscalResilience} - \text{FiscalResilienceGoal}) * (\text{ABM_Cooptation} / \text{externalStakeholders.size()})) / \text{TimeForPlanningGoal}$ |
| Constant | false |
| External | false |
| Array | false |
| Show at runtime | true |
| Public | false |
| Show name | true |
| Advanced | |
| System dynamics units | false |

Flow: ChangingStrategicGoal

| Title | Type | Dataset / Value | Point Style | Color | Line | Width | Interpolation |
|-----------------------|---------|------------------|-------------|------------|------|-------|---------------|
| Cooptation | dataset | ABM_CooptationDS | NONE | darkOrange | true | 1.0 | LINEAR |
| Average Crisis Memory | value | | NONE | slateBlue | true | 1.0 | LINEAR |

Time Stack Chart: chart

| Name | Value |
|---------------------------------|------------------------------|
| General | |
| Lock | false |
| Public | true |
| Data update | |
| Analysis auto update | true |
| ANALYSIS_UPDATE_TIME_PROPERTIES | - Recurring Event Properties |
| Dataset Samples To Keep | 60 |
| Scale | |
| Time window | 60 |
| Time | model time units |
| Vertical scale | Auto |
| Appearance | |
| Labels horizontal position | DEFAULT |
| Labels vertical position | DEFAULT |
| Label format | Model time units |
| Labels Text Color | darkGray |
| Chart Area Grid Color | darkGray |
| Position and size | |
| x | 0.0 |
| Width | 300.0 |
| y | 100.0 |
| Height | 310.0 |
| Legend | |
| Show legend | true |
| Legend size | 70.0 |
| Legend text color | black |
| Chart area | |
| Chart Area: X Offset | 50.0 |
| Chart Area: Width | 220.0 |
| Chart Area: Y Offset | 30.0 |
| Chart Area: Height | 180.0 |
| Chart Area: Background Color | white |
| Chart area border color | black |

Plot Items:

| Title | Type | Dataset / Value | Color |
|---|-------|---|--------|
| External Network Stakeholders | value | externalStakeholders. NumberExternalStakeholder() | yellow |
| Strategic Planners (External Stakeholders) | value | externalStakeholders. NumberExternalStrategicPlanner() | lime |
| Coopting Stakeholders (External) | value | externalStakeholders.NumberCoopter() | red |

Data Set: FiscalResilienceDS

| Name | Value |
|---------------------------------|------------------------------|
| General | |
| Dataset Samples To Keep | 2000 |
| Axis Data Vertical Y Axis | FiscalResilience |
| Axis Data Freeze X Axis | true |
| Show at runtime | true |
| Show name | true |
| Data update | |
| Analysis auto update | true |
| ANALYSIS_UPDATE_TIME_PROPERTIES | - Recurring Event Properties |
| Logging | true |

Data Set: FiscalResilienceGoalDS

| Name | Value |
|---------------------------------|------------------------------|
| General | |
| Dataset Samples To Keep | 2000 |
| Axis Data Vertical Y Axis | FiscalResilienceGoal |
| Axis Data Freeze X Axis | true |
| Show at runtime | true |
| Show name | true |
| Data update | |
| Analysis auto update | true |
| ANALYSIS_UPDATE_TIME_PROPERTIES | - Recurring Event Properties |
| Logging | true |

Data Set: ABM_CooptationDS

| Name | Value |
|---------------------------------|------------------------------|
| General | |
| Dataset Samples To Keep | 2000 |
| Axis Data Vertical Y Axis | ABM_Cooptation |
| Axis Data Freeze X Axis | true |
| Show at runtime | true |
| Show name | true |
| Data update | |
| Analysis auto update | true |
| ANALYSIS_UPDATE_TIME_PROPERTIES | - Recurring Event Properties |
| Logging | true |

Agent Presentation: externalStakeholders_presentation

| Name | Value |
|---|--------------------------|
| General | |
| Show at runtime | true |
| Public | true |
| Position and size | |
| x | 310.0 |
| y | 110.0 |
| z | 0.0 |
| Rotation | 0.0 |
| Scale | Automatically calculated |
| Advanced | |
| Show in | 2D and 3D |
| Draw agent with offset to this position | true |
| Show name | false |

Simulation Experiment: Simulation

| Name | Value |
|--|---|
| General | |
| Maximum available memory | 512 |
| Agent type | Main |
| Model time | |
| Execution mode | Real time with scale |
| Real time scale | 1.0 |
| Stop option | Never |
| Initial time | 0.0 |
| Initial date | Sun Nov 17 00:00:00 GMT 2019 |
| Randomness | |
| Random Number Generation Type | Random seed (unique simulation runs) |
| Selection mode for simultaneous events | LIFO (in the reverse order of scheduling) |
| Window | |
| Title | StrategicPlanningTheoryExample : Simulation |
| Enable zoom and panning | true |
| Enable developer panel | true |
| Show developer panel on start | false |
| Advanced | |
| Load root from snapshot | false |