Model Equations

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Attention to Stakeholders Favoring A  =
      INTEG( - change in attention ,
          1
             - INI ATTENTION TO STAKEHOLDER FAVORING B )
           Units: Dmnl
                              Orientation towards the stakeholders favoring the 'old' strategy A.

Attention to Stakeholders Favoring B  =
      INTEG( change in attention ,
          INI ATTENTION TO STAKEHOLDER FAVORING B )
           Units: Dmnl
                              Orientation towards the stakeholders favoring the 'new' strategy B.

change in attention  =
      ( ABS ( pcvd pressure from stakeholders favoring B
                * effect of attention to B on change )
          - pcvd pressure from stakeholders favoring A
                * effect of attention to A on change )
          * "fract. change in attention per pressure p.a."
           Units: Dmnl/Year

change in performance  =
      ( indicated performance
          - Performance )
          / TIME FOR CHANGING PERFORMANCE
           Units: performance unit/Year

change in strategy  =
      ( pcvd pressure from stakeholders favoring B
          * effect of B on change
          - pcvd pressure from stakeholders favoring A
                * effect of A on change )
          * "fract. change per pcvd pressure p.a."
           Units: Dmnl/Year

confidence effect of performance  =
      WITH LOOKUP( pcvd adequacy of performance ,
         ([(0,0)-(1.2,1)],(0,0),(0.2,0.04),(0.4,0.14),(0.5,0.22),(0.6,0.33)
         ,(0.7,0.5),(0.8,0.75),(0.9,0.95),(0.95,0.985),(1,1),(1.2,1) ) )
           Units: Dmnl
                              Effect by which performance inadequacies increase the management
                              team's openness to change. Minor inadequacies have less than
                              proportional effect, but the effect on openness quickly rises
                              before it slowly approaches the limit of a fully open
                              organization in the case of organizational collapse.

desired performance  =
      SMOOTH ( Performance ,
          TIME TO ADJUST DESD PERFORMANCE )
           Units: performance unit
                              Floating goal of desired performance.
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desired quality A by stakeholders favoring A  =
      SMOOTH ( quality A ,
         TIME TO ADJUST DESIRED QUALTIY )
          Units: quality unit
                              Floating goal of desired quality A.

desired quality B  =
      diffusion of B in remaining market
          * "REF.QUALITY B OF STRATEGY B"
          + ( 1
              - diffusion of B in remaining market )
              * "REF. QUALITY B OF STRATEGY A"
          Units: quality unit
                              Expectations by customers/stakeholders.

DEVELOPMENT OF STRATEGY B  =
      WITH LOOKUP( Time ,
        ([(0,0)-(50,1)],(0,0),(5,0),(10,0.18),(15,0.57),(20,0.9),(22,0.97)
        ,(24,1),(50,1) ))
          Units: Dmnl
                              Invention of strategy B.

DEVELOPMENT OF STRATEGY B QUICK  =
      WITH LOOKUP( Time ,
        ([(0,0)-(50,1)],(0,0),(7,0),(12,1),(50,1) ) )
          Units: Dmnl
                              Quicker invention, or different reference group.

diffusion of B in remaining market  =
      SMOOTH3 ( DEVELOPMENT OF STRATEGY B
              * ( 1
                  - SWITCH QUICK DEVELOPMENT )
              + SWITCH QUICK DEVELOPMENT
                  * DEVELOPMENT OF STRATEGY B QUICK ,
          TIME TO DIFFUSE B IN REMAINING MARKET )
          Units: Dmnl
                              Adoption of strategy B in market.

effect of A on change  =
      WITH LOOKUP( Orientation to Strategy A ,
        ([(0,0)-(1,1)],(0,1),(0.5,1),(0.75,0.95),(0.9,0.75),(0.95,0.5),
        (0.99,0.01),(1,0) ) )
          Units: Dmnl
                              Limit to the willingness to further react to pressure.

effect of attention to A on change  =
      WITH LOOKUP( Attention to Stakeholders Favoring A ,
        ([(0,0)-(1,1)],(0,1),(0.25,1),(0.5,0.95),(0.8,0.75),(0.9,0.5),(0.96,0.04)
        ,(0.98,0.005),(1,0) ) )
          Units: Dmnl
                              Limit to the willingness to further react to pressure.
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effect of attention to B on change =
WITH LOOKUP(Attention to Stakeholders Favoring B ,
([(0,0)-(1,1)],(0,1),(0.25,1),(0.5,0.95),(0.8,0.75),(0.9,0.5),(0.96,0.04)
,(0.98,0.005),(1,0)))
Units: Dmnl
Limit to the willingness to further react to pressure.

effect of B on change =
WITH LOOKUP(Orientation to Strategy B ,
([(0,0)-(1,1)],(0,1),(0.5,1),(0.75,0.95),(0.9,0.75),(0.95,0.5),
(0.99,0.01),(1,0)))
Units: Dmnl
Limit to the willingness to further react to pressure.

effect of change on inertia =
WITH LOOKUP(ABS (change in strategy) ,
([(0,0)-(0.5,7)],(0,1),(0.05,1.4),(0.1,2.4),(0.15,4.2),(0.2,5.4)
,(0.3,6.2),(0.5,6.5)))
Units: Dmnl
Small changes have an underproportional effect on consistency loss. This allows an organization to change very slowly without disruption in its internal consistency. The consistency decrease from change represents turnover rates which became higher, but it also captures changes in the people's thinking even if they remain in the organization.

effect of openness on change =
WITH LOOKUP(openness to change ,
([(0,0)-(1,1)],(0,0.05),(0.1,0.06),(0.2,0.1),(0.3,0.18),(0.4,0.3)
,(0.5,0.435),(0.6,0.63),(0.7,0.81),(0.8,0.92),(0.9,0.97),(1,1)))
Units: Dmnl
Low openness to change may reduce fractional change to 10 percent of its reference value. The effect of openness on change is an s-shaped curve indicating that the organization quickly reacts to perceived pressure if it has a rather high openness. It becomes less responsive as openness decreases until its reactivity reaches a lower bound.

effect of quality A on performance =
WITH LOOKUP(quality A ,
([(0,1)-(1,1.1)],(0,1),(1,1.1)))
Units: Dmnl
Effect that pushes performance upward proportionally to the extent to which the organization outperforms in quality A.

effect of quality A on resistance =
WITH LOOKUP(pcvd adequacy of quality A ,
([(0,0)-(1.1,1)],(0,1),(0.1,0.99),(0.15,0.97),(0.2,0.93),(0.5,0.5)
,(0.8,0.07),(0.85,0.03),(0.9,0.01),(1,0),(1.1,0)))
Units: Dmnl
Inverse s-shaped. Slowly approaches maximum, and slowly starts in the beginning because minor inadequacies cause less than proportional reactions.

"effect of rel. quality B on performance" =
WITH LOOKUP("rel. quality B" ,
([(-0.9,0)-(1,2)],(-0.9,0),(-0.7,0.53),(-0.6,0.7),(-0.5,0.85),(-0.4,0.93)
,(-0.3,0.97),(-0.2,0.99),(0,1),(0.25,1.005),(0.5,1.07),(0.7,1.2) ,(1,1.4)))
Units: Dmnl
Effect that may push performance upward or downward depending on the organization's achievement regarding quality B relative to the market. It is formulated as an order winning criterion.

FINAL TIME = 50
Units: Year
The final time for the simulation.

"fract. change in attention per pressure p.a." =
"REF. FRACT. CHANGE IN ATTENTION P.A."
* effect of openness on change
Units: Dmnl/(Year*pressure unit)
Mix of the management team's general flexibility of attention and situational factors.

"fract. change per pcvd pressure p.a." =
"REF. FRACT. CHANGE IN STRATEGY PER PRESSURE P.A."
* effect of openness on change
Units: Dmnl/(Year*pressure unit)
Mix of the management team's general responsiveness to pressures and situational factors.

FRACTION OF PERMANENTLY POWERFUL STAKEHOLDERS FAVORING A = 0
Units: Dmnl

fraction of stakeholders favoring B =
(1
- FRACTION OF PERMANENTLY POWERFUL STAKEHOLDERS FAVORING A)
* diffusion of B in remaining market
Units: Dmnl

indicated performance =
"REF. PERFORMANCE"
* performance adjustment
Units: performance unit

Inertia =
INTEG(institutionalization
- inertia decrease ,
INI INERTIA)
Units: consistency unit
Inward-orientation of thinking, cognitive inertia, ...

inertia decrease =
Inertia
* "REF. FRACT. INERTIA DECREASE"
* effect of change on inertia
Units: consistency unit/Year
Management team turnover, unlearning, ...

INI ATTENTION TO STAKEHOLDER FAVORING B = 0.1
Units: Dmnl

INI INERTIA = 0.9
Units: consistency unit
Initial value = effect of (ref. fract. consistency decrease /
ref. fract. institutionalization) = 0.9

INITIAL TIME = 0
Units: Year
The initial time for the simulation.

institutionalization =
"REF. FRACT. INSTITUTIONALIZATION"
* Inertia
* limiting effect on institutionalization
Units: consistency unit/Year
Growth of inertia, e. g. by cultural institutionalization,
learning, etc.

limiting effect on institutionalization =
WITH LOOKUP(Inertia ,
([(0,0)-(1,1)],(0,1),(0.2,1),(0.4,0.99),(0.6,0.9),(0.75,0.75),(0.9,0.5)
,(0.97,0.25),(1,0)))
Units: Dmnl
This effect counteracts the reinforcing institutionalization
loop. The more the organization is consistent, the more it slows
consistency growth down.

no of stakeholders favoring A =
"TOTAL NO. OF STAKEHOLDERS"
- number of stakeholders favoring B
Units: entity
Normalized number of customers.

number of stakeholders favoring B =
fraction of stakeholders favoring B
* "TOTAL NO. OF STAKEHOLDERS"
Units: entity
Normalized number of customers.

openness to change =
1
- Inertia
* confidence effect of performance
* "REF. OPENNESS PER INERTIA"
Units: Dmnl
Readiness to change that is limited by inertia, but may be enhanced in case of a performance threat.

Orientation to Strategy A =
INTEG(- change in strategy ,
1)
Units: Dmnl
Fraction to which the focal organization's strategy is oriented to strategy A.

Orientation to Strategy B =
INTEG(change in strategy ,
0)
Units: Dmnl
Fraction to which the focal organization's strategy is oriented to strategy B.

pcvd adequacy of performance =
Performance
/ desired performance
Units: Dmnl

pcvd adequacy of quality A =
quality A
/ desired quality A by stakeholders favoring A
Units: Dmnl

pcvd inadequacy of strategy per stakeholder B =
WITH LOOKUP("rel. quality B" ,
([(-1,0)-(1,1)],(-1,1),(0,0),(1,0)))
Units: Dmnl
Stakeholders' extent of dissatisfaction with or dislike of the focal organization's strategy/offerings.

pcvd pressure from stakeholders favoring A =
total stakeholder pressure for more A
* Attention to Stakeholders Favoring A
Units: pressure unit
The management team's biased perception of stakeholder pressure for A.

pcvd pressure from stakeholders favoring B =
total stakeholder pressure for more B
* Attention to Stakeholders Favoring B
Units: pressure unit
The management team's biased perception of stakeholder pressure for B.

Performance =
INTEG(change in performance ,
"REF. PERFORMANCE"
* effect of quality A on performance)
Units: performance unit
May represent market share, sales volume, size of customer base, etc.

performance adjustment =
"wt. on quality B vs. quality A"
* "effect of rel. quality B on performance"
+ (1
- "wt. on quality B vs. quality A")
* effect of quality A on performance
Units: Dmnl

permanently powerful stakeholders favoring A =
"TOTAL NO. OF STAKEHOLDERS"
* FRACTION OF PERMANENTLY POWERFUL STAKEHOLDERS FAVORING A
Units: entity

quality A =
Orientation to Strategy A
* "REF. QUALITY A OF STRATEGY A"
Units: quality unit
Quality of the 'old' strategy, such as price quality in trading, resolution quality in photography. This is what organizations in the respective area used to compete on.

quality B =
Orientation to Strategy B
* "REF.QUALITY B OF STRATEGY B"
+ Orientation to Strategy A
* "REF. QUALITY B OF STRATEGY A"
Units: quality unit
Achievement in quality B by focal organization.

"REF. FRACT. CHANGE IN ATTENTION P.A." = 0.05
Units: Dmnl/(Year*pressure unit)
The management team's general flexibility of attention. It may be influenced by the degree to which the organization 'looks outside' and actively seeks information on important stakeholders.

"REF. FRACT. CHANGE IN STRATEGY PER PRESSURE P.A." = 0.02
Units: Dmnl/(Year*pressure unit)
An organization's general propensity to react to perceived pressures. It may represent the degree of decentralization or employee empowerment.

"REF. FRACT. INERTIA DECREASE" = 0.15
Units: Dmnl/Year
Reference inertia decrease has been adapted to a low rate of annual turnover in order to represent an organization that accumulates inertia quickly. (Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition, Job Openings and Labor Turnover Survey (JOLTS), http://data.bls.gov/PDQ/outside.jsp?survey=jt, 22 Nov. 2009).

"REF. FRACT. INSTITUTIONALIZATION" = 0.3
Units: Dmnl/Year
Institutionalization grows by a fraction of 0.3 of current inertia per year. Since ref. institutionalization is higher than ref. consistency decrease, the organization becomes inert over the years.

"REF. OPENNESS PER INERTIA" = 1
Units: Dmnl/consistency unit

"REF. PERFORMANCE" = 0.5
Units: performance unit

"REF. PRESSURE PER STAKEHOLDER FAVORING B" = 0.6
Units: pressure unit/entity
Pressure or customer desire for strategy B.

"REF. QUALITY A OF STRATEGY A" = 1
Units: quality unit

"REF. QUALITY B OF STRATEGY A" = 0.1
Units: quality unit
Degree to which strategy A can fulfill quality B. Strategy A has a lower value of quality B.

"REF. RESISTANCE PRESSURE PER STAKEHOLDER FAVORING A" = 1
Units: pressure unit/entity

"REF.QUALITY B OF STRATEGY B" = 1
Units: quality unit
An attribute of the new strategy B. E. g. speed as the attribute of electronic trading, ability to store photos electronically, high ethical compliance, etc.

"rel. quality B" =
quality B
- desired quality B
Units: quality unit
The relative quality B expresses the difference between the focal organization's quality B and what is desired by customers/stakeholders.

SAVEPER = 0.25
Units: Year [0,?]
The frequency with which output is stored.

stakeholder pressure for more B =
pcvd inadequacy of strategy per stakeholder B
* "REF. PRESSURE PER STAKEHOLDER FAVORING B"
Units: pressure unit/entity
Pressure or customer desire for more strategy B per stakeholder favoring B.

stakeholder resistance pressure for more A =
"REF. RESISTANCE PRESSURE PER STAKEHOLDER FAVORING A"
* effect of quality A on resistance
Units: pressure unit/entity
Resistance per stakeholder due to dissatisfaction with the extent of quality A offered.

SWITCH QUICK DEVELOPMENT = 0
Units: Dmnl

TIME FOR CHANGING PERFORMANCE = 1
Units: Year
Reaction time of customers.

TIME STEP = 0.0078125
Units: Year [0,?]
The time step for the simulation.

TIME TO ADJUST DESD PERFORMANCE = 3
Units: Year

TIME TO ADJUST DESIRED QUALTIY = 5
Units: Year

TIME TO CUMULATE STRATEGY B = 1
Units: Year

TIME TO DIFFUSE B IN REMAINING MARKET = 5
Units: Year
Adoption delay in market.

"TOTAL NO. OF STAKEHOLDERS" = 100
Units: entity
Normalized number of customers.

total stakeholder pressure for more A =
stakeholder resistance pressure for more A
* (no of stakeholders favoring A
+ permanently powerful stakeholders favoring A)
Units: pressure unit
Total pressure by the entire group of stakeholders favoring A for more A.

total stakeholder pressure for more B =
stakeholder pressure for more B
* number of stakeholders favoring B
Units: pressure unit
Total pressure by the entire group of stakeholders favoring B for more B.

"wt. on quality B vs. quality A" =
fraction of stakeholders favoring B
Units: Dmnl
Importance of strategy B and quality B among stakeholders.