PLANNED ORGANIZATIONAL CHANGE: THEORY, MODEL, DATA AND SIMULATION

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THE PROBLEM

Organizations have to adapt to their environments in order to survive (Lawrence and Lorsch, 1967; Weick, 1969; Galbraith, 1967). Hence, recurrent structural changes are strategic responses of organizations to the growing turbulence of modern society (e.g., Tichy, 1983). While most organizations can alter their strategies, structures and procedures to some extent, many changes do not achieve their stated goals because of inertial forces blocking the way (Hannan and Freeman, 1984). Many of the factors affecting organizational change processes have already been identified (cf. Zaltman and Duncan, 1977), but we still lack a comprehensive view that integrates the various interplaying forces (Nadler, 1981; Carnell, 1986).

One of the early industrial dynamics studies attempted to do just that (McPherson, 1965). Inevitably, some crucial factors that were identified only later, such as type of change, pacing, employee resistance and the need for compensation (Krupp, 1972), are missing from the model. There are also conceptual problems with the model because information variables were treated as levels (cf. Jacobsen and Bronson, 1987). Most importantly, while the plotted output appears reasonable enough, no data are shown comparing model behavior with reality, leaving the empirical adequacy of the model unknown. With our model we seek to remedy these deficiencies by deriving its variables from well-grounded theory, basing its parameters on updated research findings, and comparing its behavior with empirical data.

THEORETICAL STRUCTURE

1. Performance. Planned organizational change is most likely whenever a perceived gap between desired and actual performance is too wide to be closed by routine managerial remedies (March and Simon, 1958; Downs, 1967; Daft, 1986:266).

2. Target. Change targets vary in size in proportion to the performance gap. The larger the target, the more difficult and costly will be the transition (Miller and Friesen, 1980; Nadler, 1981).

3. Simplicity. Change programs fall into three major types, according to the simplicity of their implementation: technical, political, or cultural (Tichy, 1983).

4. Cost. Any organizational change incurs certain costs: fixed costs as well as variable costs (Mirvis and Macy, 1983:503).

5. Resistance. Any change program will trigger resistance from those who prefer the status quo. The more individuals there are who feel threatened by the change, the greater the resistance will be (Lawler, 1986:33).

6. Involvement in decisions about the change has been repeatedly found effective in overcoming resistance (Kanter, 1986:192).

7. Inducements. Since involvement cannot eliminate all resistance nor guarantee cooperation, additional compensatory mechanisms are frequently needed, e.g., wage boosts, bonuses, promotions, etc..

8. Pacing. The crux of change implementation is its pacing. Crash programs do not allow for proper learning of new procedures, while sluggish implementation causes stress and fatigue. Both increase resistance and reduce performance.

The overall theoretical structure shown in Figure 1 has three major feedback loops, all hinging on the inherent resistance to change. This reflects our hypothesis that any planned organizational change will temporarily impair the organization's performance. The change will improve performance only after the initial dip (due to either costs, diffuculty, resistance or bad pacing) has been offset by an increase in involvement or compensation (Hopwood, 1979). However, a participatory management style can set involvement sufficiently high to overcome resistance even without inducements, while exogenous constraints on the ability to offer compensation can limit involvement and thus maintain the resistance. The flow diagram of the model is shown in Figure 2, followed by the code in DYNAMO (fully documented copies are available from the authors).

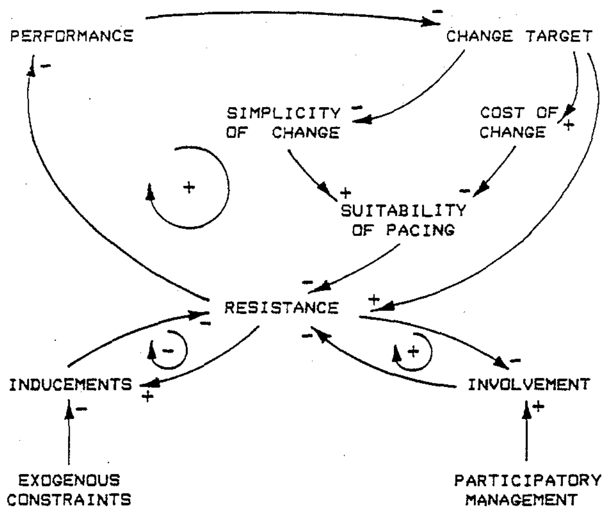

FIGURE 1
CAUSAL-LOOP DIAGRAM

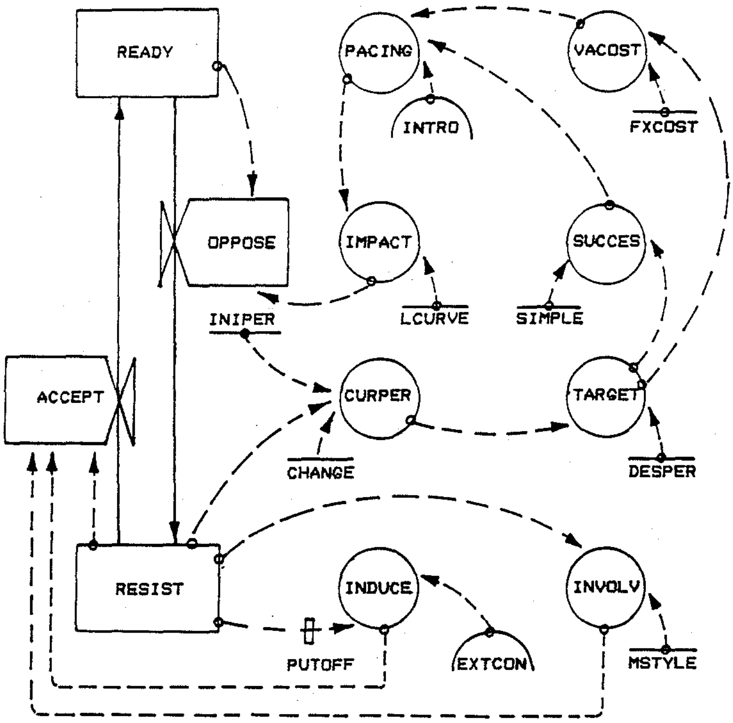

FIGURE 2
FLOW - DIAGRAM

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            ***** ORGANIZATIONAL CHANGE: MODEL 4 *****
NOTE            ONE TIME UNIT EQUALS ONE MONTH
NOTE  *** INITIALIZATIONS FOR DATA SET 01 OF FIRM ALPHA ***
C  DESPER=1.5        Desired Performance               (DIMENSIONLESS)
C  INIPER=1.176      Initial Performance               (DIMENSIONLESS)
C  CHANGE=1.33       Needed Improvement Factor         (DIMENSIONLESS)
C  MSTYLE=12         Management Style                 (PCT. EMPLOYEES)
C  FXCOST=0.05       Fixed Costs Fraction              (DIMENSIONLESS)
C  SIMPLE=0.8        Implementation Probability        (DIMENSIONLESS)
A  EXTCON.K=TABLE(TEXTCN,TIME.K,0,12,3)        External Constraints
T  TEXTCN=0/.2/.5/.8/1                    (DIMENSIONLESS MULTIPLIER)
A  LCURVE.K=TABLE(TCURVE,TIME.K,0,30,3)      Normal Learning Curve
T  TCURVE=0/3/7/16/33/50/67/84/93/97/100          (PCT. EMPLOYEES)
A  INTRO.K=TABHL(TINTRO,TIME.K,0,30,3)       Introduction Pace
T  TINTRO=5/22/25/53/53/87/100/100/100/100        (PCT. EMPLOYEES)
C  PUTOFF=1.0        Compensation Delay                      (MONTHS)
L  RESIST.K=RESIST.J+DT*(OPPOSE.JK-ACCEPT.JK)
N  RESIST=35         Resisters                        (PCT. EMPLOYEES)
L  READY.K=READY.J+DT*(ACCEPT.JK-OPPOSE.JK)
N  READY=100-RESIST   Cooperators                     (PCT. EMPLOYEES)
NOTE             *** AUXILIARY VARIABLES ***
A  INVOLV.K=MSTYLE*TABLE(TINVOL,RESIST.K,0,100,10)         Involvement
T  TINVOL=1/.97/.9/.8/.67/.5/.33/.2/.1/.30/0       (PCT. EMPLOYEES)
A  NINDUC.K=TABLE(TINDUC,RESIST.K,0,100,10)+(PUTOFF*.05)  Needed Ind.
T  TINDUC=10/20/40/60/80/90/95/100/100/100/100     (PCT. EMPLOYEES)
A  DELIND.K=DLINF1(NINDUC.K,PUTOFF)  Delayed Inducements  (PCT. EMP.)
A  INDUCE.K=DELIND.K*EXTCON   Inducements Given      (PCT. EMPLOYEES)
A  CURPER.K=INIPER*RFRES.K*CHANGE  Current Performance         (RATIO)
A  RFRES.K=TABHL(TRFRES,RESIST.K,0,100,20)     Resistance Reduction
T  TRFRES=1/.9/.7/.4/.2/.1                      (D-LESS MULTIPLIER)
A  EFFECT.K=CURPER.K/DESPER   Effectiveness                    (RATIO)
A  TARGET.K=TABLE(TTARG,EFFECT.K,0,1,.1)  Change Target
T  TTARG=50/48/45/41/35/23/15/9/5/2/0              (PCT. EMPLOYEES)
A  SUCCES.K=1-(1-SIMPLE)*(TARGET.K/100))    Success Chances  (PRBLTY.)
A  VACOST.K=(TARGET.K/100)+((TARGET.K/100)*FXCOST)
NOTE                                  Variable Costs    (PROBABILITY)
A  PACING.K=INTRO.K*((SUCCES.K+VACOST.K)-(SUCCES.K*VACOST.K))
NOTE                         Implementation Pacing   (PCT. EMPLOYEES)
A  IMPACT.K=PACING.K-LCURVE.K         Change Impact  (PCT. EMPLOYEES)
A  NEGIMP.K=CLIP(IMPACT.K,-IMPACT.K,IMPACT.K,0)  Absolute Impact
NOTE                                                 (PCT. EMPLOYEES)
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A    EFIMP.K=TABLE(TEFIMP,NEGIMP.K,0,100,10)         Pacing Effect
T    TEFIMP=0/.03/.08/.2/.35/.5/.65/.8/.92/.97/1              (MULTIPLIER)
NOTE                   ***  RATES  ***
R    OPPOSE.KL=READY.K*EFIMP.K  Opposition Rate (PCT. EMPLOYEES/MONTH)
A    EFINV.K=TABLE(TEFINV,INVOLV.K,0,100,10)   Involvement Red. Factor
T    TRFINV=0/.03/.08/.2/.35/.5/.65/.8/.92/.97/1              (MULTIPLIER)
A    EFIND.K=TABLE(TEFIND,INDUCE.K,0,100,10)     Inducement Red.Factor
T    TEFIND=0//03/.08/.2/.35/.5/.65/.7/.92/.97/1              (MULTIPLIER)
R   ACCEPT.KL=RESIST.K*((EFINV.K+EFIND.K)-(EFINV.K*EFIND.K))
NOTE                           Acceptance Rate (PCT. EMPLOYEES/MONTH)
END
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DATA AND SIMULATION

The data we have tried to reproduce with this model come from a major electronics firm in Israel that switched to matrix organization in October 1984. Figure 3 shows the performance data (D) measured in monetary terms for the subsequent 18 months, along with the model variable CURPER (M). Table 1 gives the exact values of some of the simulated variables, indicating that the theory and model are empirically adequate at least for this data set. The initial dip in performance is clearly evident but, just as clearly, performance declined sharply after fourteen months because of poor pacing, leading the firm to initiate another change.

P E R F O R M A N C E (OUTPUT/INPUT)

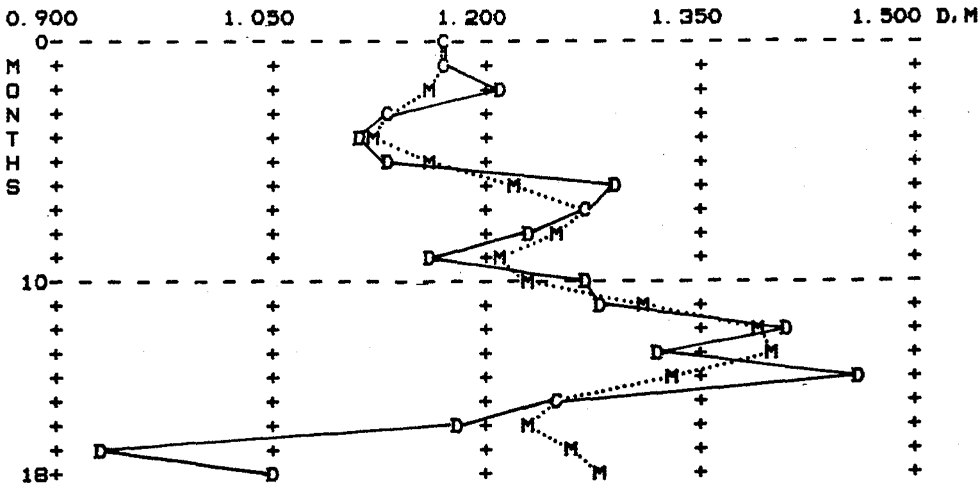

FIGURE 3
D = DATA M = MODEL

TABLE 1

DATA1 AND SIMULATED VALUES OF SELECTED VARIABLES

TIME	DATA1	CURPER	RESIST	PACING	NEGIMP
00	1.1730	1.1731	35.000	4.9462	4.9462
01	1.1720	1.1692	35.244	10.550	9.5501
02	1.2120	1.1558	36.106	16.145	14.145
03	1.1270	1.1316	37.649	21.721	18.721
04	1.1070	1.1204	38.369	22.697	18.363
05	1.1330	1.1550	36.155	23.722	18.055
06	1.2890	1.2225	31.841	24.783	17.783
07	1.2690	1.2693	28.849	34.095	24.095
08	1.2310	1.2524	29.929	43.336	30.336
09	1.1620	1.2051	32.953	52.507	36.507
10	1.2710	1.2254	31.653	52.546	30.880
11	1.2780	1.3059	26.504	52.704	25.370
12	1.4130	1.3888	21.206	52.845	19.845
13	1.3210	1.4007	20.444	64.165	25.499
14	1.4570	1.3343	24.690	75.325	30.992
15	1.2510	1.2539	29.829	86.346	36.346
16	1.1850	1.2336	31.128	90.579	34.912
17	0.9300	1.2565	29.668	94.956	33.623
18	1.0540	1.2783	28.274	99.338	32.338

CONCLUSION

One successfully reproduced data set is, of course, insufficient evidence of empirical adequacy, and further tests on additional data sets are needed before we can claim that the theory is correct. Our model reflects the view that planned change in organizations sets different forces into motion which interact in dynamic and complicated ways. "If causal links are ignored, either because they are new, or because their effects in the past have been benign, or because the world is inherently too complex, then changes that seem locally adaptive may produce unanticipated or confusing consequences. Concurrent, parallel processes of *prima facie* sensibility may combine to produce joint outcomes that are not intended by anyone and are directly counter to the interests motivating individual actions" (March, 1981:566). Our model and empirical example underline the wisdom of that statement.

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