

## Research Article

### Simulation of Performance Evaluation about Government Leader

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**Abstract:** The structural model of GLP is set up in the study, which consists of cost subsystem, outcome subsystem, evaluation subsystem, social subsystem and behavior subsystem. The five subsystems show interaction and independent each other, in which evaluation subsystem is the core ties of connection. Then the results of qualitatively simulating evaluation of GLP can be comparatively analyzed by the method of Qualitative Reasoning.

**Keywords:** Government leaders' performance, qualitative simulation, performance evaluation

#### INTRODUCTION

Performance evaluation, which can be made as a valid management way of measuring and improving Government Leaders' Performance (GLP), has been widely applied in management practice, while the theory of public selection and new management thoughts have been dissolved into the domain of government management. So most people think government management around the world is showing a tendency of the evaluative state. The character of GLP shows collective responsibility and individual responsibility, collective contribution and individual contribution. GLP can be usually regarded as a means to serve organizational performance, so evaluation of GLP consists of performance evaluation of government organization and leader team or individual leader and of economic development and social management and internal office management.

Evaluation of GLP is an important mean to manage organizational system and an effective implement to manage leader, which aims to promote effectiveness of government work and to train outstanding leaders. Three dimensions should be considered for the goals of GLP, one is development strategy which is the general goal leading Leaders' Performance (LP), the other is management efficiency and talent training which serve for development strategy (Szamosi and Duxbury, 2002).

LP is not a conception of defined normally, which includes different definition and comprehension and interpretation, such as leaders' achievements, leaders' accomplishments, leaders' effectiveness and leaders' efficiency and so on (Gu, 2007). Chen and Zhu (2001), Zhuang (2003) and Qiu (2004) thought that LP is the sum of behavior ability and resource assumption and cost quality and outcome feedback, is the organic unity of efficiency and achievement and benefit.

In the study LP is an important practical category focused on leader achievements and effects, which is

the result leader main body gives full play to consume resource and also is the effectiveness reached during the process of leader efforts, according to all firsthand material implicated in the process of actual leading. Evaluation of GLP is to measure main body behavior and contribution, working quality and effectiveness, adopting specific operational methods and technical ways (Jiang and Liu, 1999).

The study uses a scientific quantitative method, qualitative simulation, to evaluate GLP to really reflect leading level and achievements and contribution and to describe connected steps and operational process of evaluation of GLP. The structural model of GLP is set up in the study, which consists of cost subsystem, outcome subsystem, evaluation subsystem, social subsystem and behavior subsystem. The five subsystems show interaction and independent each other, in which evaluation subsystem is the core ties of connection. Then the results of qualitatively simulating evaluation of GLP can be comparatively analyzed by the method of Qualitative Reasoning.

#### THEORY OF INFLUENCE ORGANIZATIONAL PERFORMANCE

Lord and Maher (1991) put forward theory of Influence Organizational Performance in 1991, which leading behavior takes general effect on organizational performance. Influence mode that high manager effects on organizational performance can be divided into internal surroundings and external surroundings, further into direct way and indirect way. The specific leader means can be seen from Table 1 (Day and Lord, 1998).

Based on aim dimensions of evaluation of GLP and theory of Influence Organizational Performance, the structural model of performance evaluation of GLP is set up in the study, which consists of cost subsystem, outcome subsystem, evaluation subsystem, social subsystem and behavior subsystem (Fig. 1).

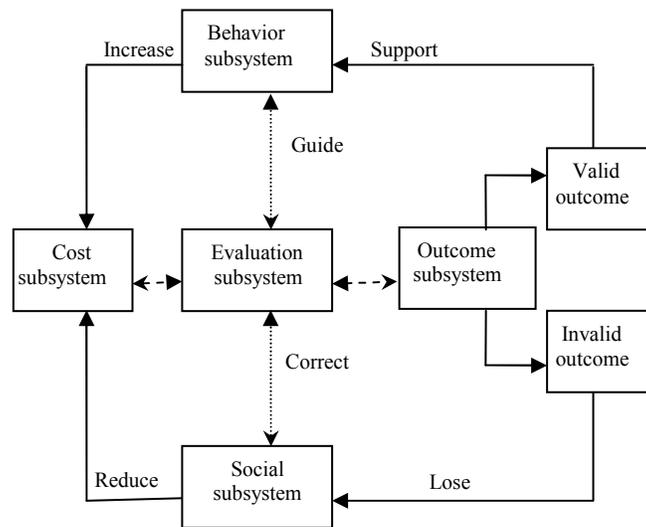


Fig. 1: Structure model of evaluation of GLP

Table 1: Potential leader’s means to influence organizational performance

Indexes	Direct tactics	Indirect tactics
<b>Internal surroundings</b>		
Subsystem	Effect and function	Management program
Management behavior	Management information system	Information symbolized
Outcome	Reduction of leading cost	Promoting outcome standard
Quality	Improving quality control	Promoting quality standard
Organizational surroundings	Organizational policy	Strengthen decision participation standard
<b>External surroundings</b>		
Market surroundings	Organizational design	Higher management program
Production management system	Strategy program	Leading higher management
Resource requirement and permit bounds	Integration horizontally and vertically, not competitive price	Forming good public thinking, promoting product and organization images
Government policy	Direct policy influence	Policy influence by other organization

The five subsystems show interaction and independent each other, in which evaluation subsystem is the core ties of connection. Process of evaluation of GLP is a dynamic system, that is to say, not a simple process of input and output, but a constant circle process among information input and conversion and output. It is assumed that outcome subsystem can realize feedback function, furthermore valid outcome support behavior subsystem and compensate cost subsystem, invalid outcome lose social subsystem and reduce cost subsystem. To some extent, valid outcome would be compensating and repairing losses caused by invalid outcome, so that organizational system keeps stable structure and function to reach balanced development.

### QUALITATIVE SIMULATION OF EVALUATION OF GLP

**Knowledge expression of evaluation factors of GLP:** Cost subsystem includes Intangible Cost (IC) and Tangible Cost (TaC), in which IC includes Time Cost (TiC), Intelligence Cost (IC) and organization cost (OC), TaC includes Human Cost (HC), Financial Cost

(FC) and Material Cost (MC) (Chen and Yin, 2005). Outcome subsystem includes Effective Outcome (EO) and Ineffective Outcome (IO) (Tan, 2005).

Evaluation subsystem includes Evaluation Indexes (EI), Evaluation Method (EM) and Evaluation Results (ER). Action subsystem includes Action Quality (AQ), Action Ability (AA) and Action Effort (AE). Social subsystem includes Social Form (SF), Social Development (SD) and Social Resource (SR).

**The method of qualitative reasoning:** Qualitative Reasoning (QR) is a key way of qualitative simulation and a main method of simulation reasoning from system. It is a stated argument in theory of QR that all variable process which describes system dynamic, can be transformed into behavior process which consists of condition and behavior. Behavior can be made as the core of QR, must be activated as conditions met from one time to the other (Gong and Li, 2004).

Behavior can be expressed by a series of time variable, further the process of variable state changing from one time to the other can be described as state conversion. Each time variable includes  $X_i$  represents a behavior state and  $D(X_i)$  represents a tendency of state conversion at time  $i$ th and  $D(X_i) = (X_i)'_t$ .

Table 2: Calculations of operational symbol, ©

©	-	0	+	※
-	-	-	※	※
0	-	0	+	※
+	※	+	+	※
※	※	※	※	※

Table 3: Four time regions of qualitative simulation

Stage process	Specific operations
Preparation	Selecting evaluation index and data, setting up evaluation system and way.
Implementation	Inputting evaluation data, assisting operation, outputting evaluation results.
Application	Adopting evaluation result, analysis on evaluation result, guiding work journal.
Feedback	Improving evaluation system and method, correcting evaluation.

Assuming that qualitative value domain of X is Q(X), then  $Q(X) = \{X_1, \dots, X_{i-1}, X_i, X_{i+1}, \dots\}$ ,  $Q(D(X)) = \{+, -, 0, ※\}$ , where +, -, 0, ※ separately represent increase, reduction, constant, uncertain.

When  $X = X_i$ , we can get:

$$\begin{cases} \text{if } D(X) = +, X_i \text{ is increased to } X_{i+1} \\ \text{if } D(X) = -, X_i \text{ is reduced to } X_{i-1} \\ \text{if } D(X) = 0, X_i \text{ is constant} \\ \text{if } D(X) = ※, X_i \text{ is uncertain} \end{cases}$$

Tendency of state conversion of two variables can be calculated by operational symbol, ©. The specific calculations are as follows in Table 2.

Relative strong and weak of tendency of state conversion can be calculated by expert knowledge. Its results expresses strength of D(X), STR(D(X)) and STR(-)>0, STR(0)>0, STR(+)>0 (Hu and Dong, 2005). Assuming that X and Y are time variable, D(X) and D(Y) are inverse tendency, calculations of D(X) and D(Y) by comparing STR(D(X)) and STR(D(Y)) now follow that:

Table 4: Knowledge base of qualitative simulation of evaluation of GLP

Stage	Factors	Preconditions	Relations	Effects
I	EI, EM,	NONE	STR(IC)>STR(EO,IO) EO, IO, IC	(EI, EM) <sub>i</sub> ~[(EO,IO) <sub>i+1</sub> , (IC) <sub>i</sub> ]
II	ER, TaC EO, IO	Exit EI, EM	STR (EI, EM)< STR(TaC)< STR(EO,IO); STR (EO)> STR (IO); STR(ER)≈STR(EO,IO)	(ER) <sub>i</sub> ~ [(EI, EM) <sub>i</sub> , (TaC) <sub>i</sub> , (EO,IO) <sub>i</sub> ]
III	AE, SR, SR, SF, TaC, EO, IO, ER, OC	Exit ER, EO, IO,	NONE	(AE, TaC) <sub>i</sub> ~+(EO) <sub>i</sub> (SR, TaC) <sub>i</sub> ~-(IO) <sub>i</sub> ; (SD) <sub>i</sub> ~[(SR) <sub>i</sub> , (SF) <sub>i</sub> ]; (AE, SR) <sub>i</sub> ~(ER) <sub>i</sub> ; (AE, SR) <sub>i</sub> ~-(OC) <sub>i</sub>
IV	ER'	Exit ER ER, IC, SD	STR(IC)>STR(ER) EI, EM,	(ER') <sub>i</sub> ~[(ER) <sub>i</sub> , (SD) <sub>i</sub> ]; (EI, EM) <sub>i+1</sub> ~[(ER') <sub>i</sub> , (IC) <sub>i</sub> ]

$$\begin{cases} \text{if } D(X) = + \text{ and } D(Y) = - \text{ and } STR(D(X)) > \\ \quad STR(D(Y)), \text{ then } D(X) \odot D(Y) = + \\ \text{if } D(X) = + \text{ and } D(Y) = - \text{ and } STR(D(X)) < STR(D(Y)), \\ \quad \text{then } D(X) \odot D(Y) = - \\ \text{if } D(X) = + \text{ and } D(Y) = - \text{ and } STR(D(X)) \approx STR(D(Y)), \\ \quad \text{then } D(X) \odot D(Y) = 0 \end{cases}$$

**Qualitative simulation of evaluation of GLP:** According to operational procedure, the process of qualitative simulation is divided into four continuous time regions, depending on QR to dynamically simulate evaluation of GLP (Table 3).

Usually SF, AQ and AA keep stable in a certain stage. TiC and IC have always been in a state of input during evaluation of GLP. Four continuous time regions can be qualitatively expressed in Table 4. In Table 4 variable effects can be defined as follows:

If X effects on Y positively, namely  $Y \sim +X$ , D(Y) must add D(X); If X effects on Y negatively, namely  $Y \sim -X$ , D(Y) must add D(X); If X effects on Y positively or negatively, namely  $Y \sim X$ .

**A CALCULATION EXAMPLE, “HIGH COST, HIGH OUTCOME”**

Qualitative changes of some variables in evaluation system in different stage can be seen from Table 5. Depending on value of variables in Table 5, we can obtain the results of QR. It now follows that:

$$\begin{aligned} D(EI, EM)_i &= D(EO, IO)_{i-1} \odot D(IC)_i = ※ \odot + = + \\ D(ER)_i &= D(EI, EM)_i \odot D(TaC)_i \odot D(EO, IO)_i = + \odot \\ &+ \odot + = + \\ D(AE)_i &= D(ER)_i \odot -1 * D(OC)_i \odot D(EO)_i = + \odot - \odot \\ &+ = ※ \\ D(SR)_i &= D(ER)_i \odot -1 * D(OC)_i \odot -1 * D(IO)_i = + \odot - \\ &\odot - = - \\ D(SD)_i &= D(SR)_i \odot D(SF)_i = - \odot 0 = - \\ D(ER')_i &= D(ER)_i \odot D(SD)_i = + \odot - = ※ \\ D(EI, EM)_{i+1} &= D(ER')_i \odot D(IC)_i = ※ \odot + = + \end{aligned}$$

Table 5: Qualitative changes of some variables

	I	II	III	IV
D(TIC) <sub>i</sub>	+	+	+	+
D(I C) <sub>i</sub>	+	+	+	+
D(OC) <sub>i</sub>	0	0	+	0
D(TaC) <sub>i</sub>	0	+	0	0
D(EO) <sub>i</sub>	0	+	0	0
D(IO) <sub>i</sub>	0	+	0	0
D(AQ) <sub>i</sub>	0	0	0	0
D(AA) <sub>i</sub>	0	0	0	0
D(SF) <sub>i</sub>	0	0	0	0

Table 6: Qualitative changes of reasoning variables

	I	II	III	IV
D(EI) <sub>i</sub>	+	0	0	+
D(EM) <sub>i</sub>	+	0	0	+
D(ER) <sub>i</sub>	0	+	+	※
D(AE) <sub>i</sub>	0	0	※	0
D(SR) <sub>i</sub>	0	0	-	0
D(SD) <sub>i</sub>	0	0	-	0

In Table 6, it is obvious that high outcome of GLP can reach good ER, “+”, but high cost can consume SR a lot and hinder SD. High outcome of GLP may encourage leaders to exert themselves to the utmost to achieve the future performance. High cost of GLP may prevent leaders’ efforts, quality and ability which need to be improved further. Based on promoting GLP, ER benefits selection of EI and adjustment of EM and makes evaluation of GLP more scientific, rational, objective and reasonable in the next stage.

### CONCLUSION

The study initially probes into qualitative simulation of evaluation of GLP, totally describes connected steps and operational process which basically conform to manage practice, further taps the deep latent information. It is a new way to research on structure mode and system process of evaluation of GLP by using qualitative simulation which presents good application prospects.

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