

## Management Life Prediction Based on Gray Theory

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**Abstract.** Most researches focus on the relationship between managers' background characteristics and enterprise performance, technological innovation, etc., and more focused on the direct link between the management background characteristics and corporate performance, technology innovation, to leave a certain research space in this paper. This article tries to predict the manager's term according to the manager's background, which is the life of the manager. Taking into account the post requirements of managers there are certain positions, this paper attempts to introduce managerial requirements and match manager background characteristics with job requirements. Through the calculation of the matching degree for several years, the manager can predict the future match degree of the manager and the management position, in order to predict the manager's job life.

### Introduction

With the development of economy and the aggravation of competition, the competition between organizations depends not only on the technical strength, but also on the human resource strength. Managers, as an important part of organizational human resources, have a significant impact on the organization's operation and decision-making. The use of other resources in the organization must rely on managers to promote, to play the role of managers to promote, requires managers to match their positions, and based on the matching situation to consider the life of managers in this post. In order to avoid friction from the tissues, resulting in a rise in the organization cost.

Scholars use organizational behavior to study the executive team of listed companies, and think that the executive turnover of listed companies is related to some personal characteristics of executives.

Foreign scholars mainly divided into two categories: the individual population characteristics and the characteristics of the group population heterogeneity and team level population characteristics.

Pfeffer (1983) <sup>[1]</sup> first used the demographic characteristics model in sociology to analyze the reasons of listed company executives turnover. The study found that, according to the principle of "people get along with similar attraction, when an individual joins a strange group, his satisfaction depends on other people in this group and their differences on the demographic characteristics; When he found himself and his group of other people in large differences, satisfaction will be very low, resulting in resignation.

Schneider <sup>[2]</sup>, Wiersema and Brid <sup>[3]</sup> of the research results and conclusions are similar to that of Pfeffer, An important reason for the turnover of executives is that their own characteristics and the characteristics of the group members have a large gap.

Wagner <sup>[4]</sup> looks at the managers of outstanding companies, the study of the top 31 executives of the top Forbes companies in the top 599 executives turnover behavior also found: There is a positive correlation between turnover rate and turnover coefficient of two variables (the age of team members and the tenure of this firm).

In China, the research is less. Ke Lin, Sun Jianmin <sup>[5]</sup>, Zhang Biwu <sup>[6]</sup> is different from previous scholars team level research, from the individual level analysis of 2000 to 2003 all Shanghai, Shenzhen listed companies more than 20 thousand executives turnover reasons. Zhou Jun (2008) <sup>[7]</sup>

found that: age heterogeneity and team tenure heterogeneity and turnover rate significantly positive correlation, education heterogeneity and turnover rate marginal positive correlation .

From the previous studies we found that the research of demographic characteristics on executive turnover was conducted in the Western cultural background, and so far, based on the relationship between the two studies is quite small. And both the study of the heterogeneity of the demographic characteristics or demographic characteristics at the team level are considered in the team level. Based on the individual level of the two studies is rare. Because of China's listed companies generally have "dominance" phenomenon, the actual situation as chairman on behalf of the controlling shareholders have greater decision-making power, so the research object of this paper is defined as the chairman of the individual level. Taking into account the demographic characteristics is only a part of the characteristics of managers, in order to examine the management characteristics more comprehensively, this paper combines the managers' ability characteristics and personality characteristics into the study.

### Matching Degree Calculation Model

Post matching system, post employment cycle is shorter, the number of managers' background index is not much. Therefore, the post requires multivariate sequence, the management background characteristics of the sequence are small-scale multivariate sequence, it is difficult to use existing multivariate sequence model analysis of human post matching degree. Therefore, based on the basic idea of gray relational analysis, the horizontal and vertical matching degree measurement model is constructed, and the comprehensive matching degree model is established.

**Measurement of Matching Degree.** Definition 1: let  $X$  management requirements of its behavior sequence, it has behavioral requirements in two dimensions of time and ability, remember the time behavior of the value of  $a_i$ ,  $1 \leq N$ ;  $N$  is a constant,  $X_0 = (a_0i) 1 \times n$  is said to require sequence for the post.

$$X = (a_i) 1 \times n = (a_1 \cdots a_n) \quad (1)$$

Define 2: set  $Y = (A_i) 1 \times n$  managers' background sequence, which

$$Y = (A_i) 1 \times n = (A_1 \cdots A_n) \quad (2)$$

$$\text{Let } d_{\max} = \max \max |X - Y|, \quad d_{\min} = \min \min |X - Y|$$

Called  $d_{\max} = \max \max |X - Y|$  is the maximum distance,  $d_{\min} = \min \min |X - Y|$  for the minimum distance, said

$$\varepsilon_i = \frac{d_{\min} + p d_{\max}}{a_i - A_i + p d_{\max}} \quad (3)$$

Is  $X$   $k$  match coefficient matrix, where  $p$  is the resolution coefficient

Human post matching model pays close attention to the close relationship between the background characteristics of managers and post requirements, Within the hiring cycle manager background characteristics and job requirements gap is smaller, the greater the matching degree. Therefore, the matching degree model can reflect the post match degree.

Definition 3: Set  $Z = (z_i) 1 \times n$  is a manager's matching degree coefficient matrix, the matching coefficient weight is  $W_i$ , satisfying:

$$\sum_{i=1}^n W_i = 1 \quad (4)$$

$W = (W_i) 1 \times n = (W_1 \cdots W_n)$  is the weight matrix of the matching coefficient, manager and job requirements for the matching degree:

$$R = \sum_{i=1}^n E_i W_i \quad (5)$$

R is a human post matching degree model.

### Based on GM (1, 1) Model and Human Post Matching Method.

In actual work, with work experience, influence of psychological contract adjustment and other factors, the incumbent will show up in the post ability, decreased and remained unchanged with the change and development of the management situation, managers' background characteristics into dynamic data.

It is not enough to reflect the dynamic change of manager and management post matching with the current background characteristics of managers. Therefore, it is necessary to predict the evolution trend of the next cycle according to the change trend of the matching degree between the job holder and the post.

Due to the data obtained three years of post matching scale is small, and there are a lot of uncertainties. Therefore, this paper introduces the gray system method of small sample data prediction to predict the development trend of the  $mX1$  is  $X0$  1-AGO sequence,  $Z1$  is  $X1$  adjacent to the mean generation sequence,  $[a, b]T = (BTB)^{-1}BTY$ , so:

$$\frac{dx1}{dt} + ax1 = b \quad (6)$$

Is GM (1, 1) model.

In order to ensure the accuracy of  $T_q$  to  $T_s$  matching degree, the equal dimension metabolic model in grey prediction model group is selected. Data dimension is  $q-p+1$ , Metabolic prediction was  $s-q+1$  times, Each metabolism forecast only the next time human post matching degree,  $n$  the prediction process, delete old information, add information, maintain data dimension, improve forecast accuracy.

### Post Life Prediction Based on Matching Degree

Combined with management post multivariate sequence, managers' background feature matrix, using definition 1, definition 2, and definition of 3 respectively calculate the post matching coefficient and matching degree. According to the Eq.6, the metabolism prediction model of human hillock fit degree is established, The dynamic development matrix of human hillock matching degree is constructed by iteration. Reference to the previous scholars on the matching degree in the matching degree of assignment and forecast to calculate the various grades, evaluate a manager and management position is "completely," and "more," "matching fair", "do not match", or "no match".

When a manager and job requirements match in "not match", or "completely do not match" that the manager's post life should be terminated, that is to achieve the purpose of this article completed the life prediction of management positions.

### Lack of Research

In this paper, the manager turnover is forced to leave, without considering the manager's active resignation, that in the context of economic downward pressure, the motivation of active resignation weakened.

The staff and work whether the match will determine the key enterprise and the organization is efficient and harmonious, is directly related to the interests of the enterprise. So that the main reason is that the forced departure of management ability and management positions do not match.

The requirements of the job with the macro environment, corporate strategy will change, considering the complexity and diversity of these changes, Assume that one of the best indicators in

the same industry in a given period is a job requirement for that period and the job requirements reflect these changes.

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