

A Human Capital Network Model

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Abstract. Human capital, an important part of the enterprise, is the key factor that can make enterprise work effectively. Human capital management is a division that adjusts to the requirement of the enterprise development strategy. We consider several models to build the human capital network model in hopes of evaluating the personnel changes' influence on the HR health of organization, the productivity of organization and other aspects. The human capital network model consists of staff evaluation model, network model and human capital budget model. Dissatisfaction degree, analytical degree, shortest distance and churn costs are properties of any node in the network. We utilize SWOT method to make human resources planning for the future according to the internal and external environment.

Introduction

Human capital management can arouse the enthusiasm of employees, even can tap employees' potential to create value and bring benefits to the enterprise through recruiting, training, evaluating, rewarding, using, adjusting and a series of processes. A series of human capital policies and the corresponding management activities assure the realization of enterprise strategic targets.

The Analysis of Human Resources

Employees leave the work for personal reasons or some factors such as enterprise culture or retirements." Organization Churn" is to name the turbulence caused by it.

The normal development of the enterprise need stable churn ratio kept in a certain level. In this way, enterprise not only can maintain their normal operation but can keep dynamic. The company's churn ratio has been steady growing (especially the middle managers). In order to reduce the churn ratio, the company will recruit some low-level employees. But such a measure will influence company efficiency.

Leaders seek to create an effective organizational structure which make people assigned to the job suited to their talents and experience. When the churn ratio changes, what effect will happen to the enterprise?

The Design of the Human Capital Network Model

In order to provide a reasonable evaluation strategy, We use some ways to tackle this problem
Our approaches

- According to the staff own ability score and the value of position requirement, we determine the staff-position suitable degree, and use it to measure the dissatisfaction degree.
- By initial incumbency ratio, proportion of recruitment and different levels of recruitment costs, we analyze the recruitment costs and incumbency ratio in the different churn ratio.
- Set up a human capital network model of personnel situation; discuss the influence of various

position personnel churned to the enterprise.

- Using SWOT analysis model to plan the future policy of the enterprise human resources.

Staff evaluation model. According to the ability of the staff , we can determine the suitable degree to the staff and their position which we define as the position suitable degree^[1]. The higher position suitable degree means the less satisfaction of the staff and lower churn ratio. The goal of personnel decisions should make both the enterprise and staff progress together. The personnel decisions is supposed to improve the position suitable degree. We use 1, 2, 3, and 4 to represent the ability of staff, and larger number means higher ability. Correspondingly we use 1, 2, 3, and 4 to represent the position requirement, and also larger number means higher requirement. 0.5 厘米 We build a staff-position suitable degree model. The influencing factors include the ability of the staff and the assess of the supervisor to the staff. The requirement of the position includes the ability of analysis (B), emergency response capability (C), organization skills (F), and language skills (E).

Through analyzing the actual state of staff, we get the score of 5 aspects of the staff. We get the degree of mismatching, denoted by x_i , defined as the absolute value obtained by using the evaluation of the staff to subtract the degree of position requirement. For example, staff1 gets the scores 4, 3, 4, 2, 4 in aspects A, B, C, F, E. The corresponding position requirement are 3, 4, 4, 2, 3. Then, the degree of mismatching for staff1 and his position is calculated as follows:

$$x_i = |4 - 3| + |3 - 4| + |4 - 4| + |2 - 2| + |4 - 3| = 1 + 1 + 0 + 0 + 1 = 3$$

(1)

When the staff scores highest in all the 5 aspects, and the requirement degree of his position are all 1, the mismatching degree is the maximum calculated as follows:

$$x_{\max} = |4 - 1| + |4 - 1| + |4 - 1| + |4 - 1| + |4 - 1| = 3 + 3 + 3 + 3 + 3 = 15$$

(2)

We define the suitable degree as the difference of the maximum mismatching degree and the corresponding mismatching degree. The maximum suitable degree is 15 and the minimum is 0.

Network Model. We construct the ICM staff working relationship network (WRN). Specific practices as follows: in each two-divisions-unit that has seven employees, we choose a manager to manage the six same-level-stuff^[2]; In four-person units, we use the same method to choose the manager to manage the other three employees. Every manager directly related to the lower or higher level managers. In this case, we make the managers of institutions for a node, the being managed employees to another node. Divide all jobs for 3 layers, we get the staff working relationship network frame is as follows:

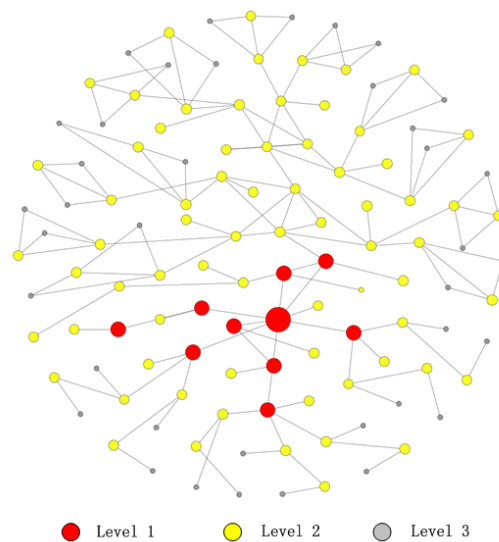


Figure. 1

Level 1(top-level managers): CEO and Managers directly under CEO,add up to 10;

Level 2(middle-level managers): A part of managers who are not directly under CEO in Facilities division, research division, sales marketing division,VP,HR,CFO and CIO. The rest are Director 1 to 6 and inexperienced employee, add up to 70.

Level 3(low-level employees): Employees that belongs to Branch A to L,Network branch and Information branch in research division, Plan blue and Plan Green that are belong to Facilities and the three branches in Sales Marketing division^[3],add up to 290.

The network shows in Fig 1 belongs to the company's overall external networks. We have two 7-people unit of same branch (Figure 2) and 4-people (Figure 3) office connected carefully into networks. The two networks are as follows:

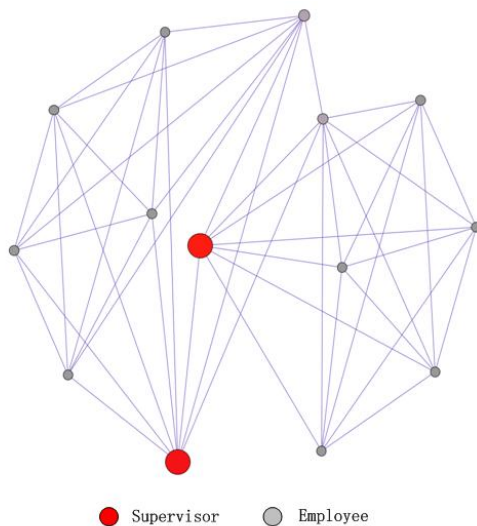


Figure. 2

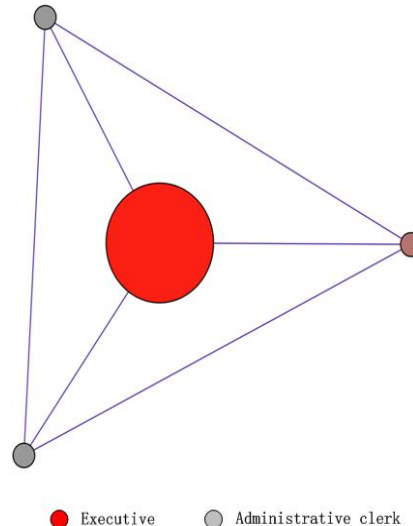


Figure. 3

Fig 2 shows internal network in the two 7-people unit of branch. It shows messages between the two units of the same branch are passing by the unit managers. When a manager is not in his position, in order to ensure the message from another department can express successfully to any other employee, we assume all employees in the same unit have a whole unicom relationship.

Fig 3 is internal network in 4-people office. We choose a person among four people to be a supervisor, the rest to be the ordinary staff. Employees in same office have all the allied relationship.

Human Capital Budget Model. We must clear the concept of churn ratio, which is the average

annual churn rate here. In our opinion, churn ratio(η) is the ratio of the sum of the total number of churn employees this year(N_L) in the total number of employees at the beginning of this year(N_o) and the number of employees increasing in this year(N_c)^[4]. We write a formula as follows in order to illustrate the relationship of η 、 N_c and ε .

$$\eta = \frac{N_L}{N_o + N_c} \times 100\%$$

(3)

$$N_c = \frac{2(N - N_o)}{3}$$

(4)

$$\varepsilon = \frac{N_o}{N}$$

(5)

Normally when churn ratio and incumbency ratio in every level equal to the average ratio, we can use the formula above to calculate the number of incumbents and the number of recruited employees in each level, then calculate human capital budget^[5].

Human resource planning based on SWOT^[6]. First of all, in the investigation and analysis of the factors to take into account not only should we consider the history and current situation of the company, but also consider the future development of the company.

Second, the basic idea to develop the plan is to exert the advantage factors, overcome the weakness factor, make use of the opportunity factors, defuse the threat factors, consider the past, base on the current, and focus on the future.

By using system analysis method of comprehensive analysis, we need to consider matching up various environmental factors, and get a series of strategies the company can choose for the future development. It can make the complex information clear, and make the decision makers of enterprise clearly understand the business environment and analyze the situation, which improves the decision accuracy^[7]. Consider the four dimensions of the SWOT analysis in integrated, namely SWOT matrix.

Table 1 SWOT matrix

External environment	Internal environment		
	advantages		disadvantages
	opportunities	Utilize S-O strategy	Improve W-O strategy
	threats	Monitor S-T strategy	Eliminate W-T strategy

According to the internal and external factors, we make the corresponding HR strategy:

☛ Increase temporary workers, timely replenish fresh blood.

☛ Adjust salary as the "basic salary + bonus"^[8] to make it more

incentive :

- ☛ Allocate mid-level positions staff shares.
- ☛ Increase staff's market competition by using the advantage of enterprise culture:
- ☛ When hiring staff^[9], pay attention to staff's basic quality.
- ☛ Pay attention to the enterprise training and improve the collective consciousness:
- ☛ Provide excellent staff the corresponding status and treatment^[10], and reduce the churn rate.
- ☛ Pay attention on staff training and improve internal staff promotion.

Summary

Three sub models form an integrated system through the final SWOT model, which can evaluate the plans and solve problems. Introduce the concept of the degree and improve it in the process which to solve complex network node of the problem in significance.

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