

## Coding: Key Technology of Establishing the Competency Model

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**Abstract:** Competency model is the most popular method of human resource management tools. It has been introduced into practice of human resource management in about 90% of the world's top 500 enterprises. Interview and coding technology are the key technologies to establish the competency model, at present, the behaviour event interview has been specifically described by many articles about competency model, however, the introduction about the coding technology is comparatively vague and insufficient, and most of researches are focusing on the brief process and statistical analysis of coding. Referring to numerous literatures, combined with the practical experience sharing from human resource management experts in China's large enterprises, we put forward the key technology for establishing the competency model—its specific method, principles and process of coding technology with aided described by specific example, which provides practical operative guidance for any staff to establish the competency model.

**Key words:** Competency; Competency model; Behaviour event interview; Coding; Theme analysis

### 1 Introduction

Recent years, as the accelerating process of internationalization and informationalization, the outer environment is becoming more and more complicated, along with the fiercer competence of market, people are becoming the center of the management of enterprises. And more clearly we are now know that traditional human resource management method which based on job analysis can no longer qualified to realize company sustainable development goals, as a result, Chinese human resource management is transforming from based on job to based on competency.

From up 1970s to now, researches on competency in Europe and America are relatively mature. In general, they have gotten through the develop process from theory research to practical application, from heat discussion about the concept of competency to its judgment and establishment<sup>[1]</sup>. In the middle of 1980s, many enterprises from many fields swarmed to establish competency model and apply it to every segment of human resource management.

In China, the concept of competency was first formal introduced in research document in the late 1990s, Wang Zhongming and Shi Kan are two outstanding representatives in this arena. The researches of competency in our country are mainly focused on its concept and localization research, establishing method and practical application in enterprises, etc. What is more, we did introduced lots of things about its establishing process behaviour interview, but we haven't set foot in the field of coding technology yet. So Shi Kan, Wang Jicheng, Li Chaoping etc have introduced general process of coding technology, and Peng Pinggen has detailed research on codeability of interview materials and at the same time, Lou Weiyu and Liu Yezheng<sup>[2]</sup> etc have done some researches job on the statistic analysis of coding.

### 2 Competency Model

Professor of Harvard University David Mclelland published an article in <American Psychologist>: "Testing For Competency Rather Than Intelligence" in 1973, it was in this article that the concept of competency is first brought out<sup>[3]</sup>. Competency is "a kind of personal characteristic which can distinguish outstanding from ordinary performance in certain working post and organization environment." And this personal characteristic is a out behavioral characteristic which generated from stable inner psychological features.

Competency model is the sum competency characteristics required for being a certain position. It includes: name, concept, rank and explanation of behaviour index, model structure. The model is a unique human resource management method to strengthen competence as well as improve practical performance on the basis of organization development strategies. And its application mainly center in human resource planning, performance management and training development. Moreover, the fundamental objective of establishing competency model is to direct employees to grow with the company, to improve enterprise core competence and realize company's strategic goals ultimately.

In the process of establishment, we should be careful that besides considering the competency of

present elite employees, we also should take competency of enterprise's strategy, competency of enterprise culture and the competency of benchmark requirement of employees into consideration, for these requirements maybe not needed at present but will be in a long term. And these competencies are originated by enterprise's strategies, culture transformation, high-rise interview and counterpart's model as well.

### 3 Behavioral Event Interview

There are mainly three methods of establishing the competency model: strategy direction, behavioral event interview and benchmark research. Today, behavior event interview (BEI) is the most used method, through interviewing staff with different performances, by collecting their behavioral material, then we can statistical analysis the key characteristics to form the competency model, in fact, it is a kind forecast and prospect of the future competency features on the basis of former successful experience. The merit of this method is that it has full and detailed behavioral material to support the effectiveness of the established competency model, which is surely fairly objective.

The main objective of BEI is to collect relative interviewees' behaviour issue, and it is developed from the Critical Incident Technique (CIT), by John C. Flanagan, combined with Thematic Apperception Test (TAT). And the main process in BEI is to let interviewees to describe his the most proud (or most frustrated)thing he had ever done in his position(key performance field) in the past 1-2 years, especially let them talking about the role play and the performance in that issue, and the final consequence, etc of it.

While in the process of establishing the model, we are required to select two groups of people to accept interview, one is excellent performance group and the other is the normal one, and then apply contrastive analysis method to generate the behaviour and mental different characteristics within the two groups.

The general process of BEI is shown in Figure 1.

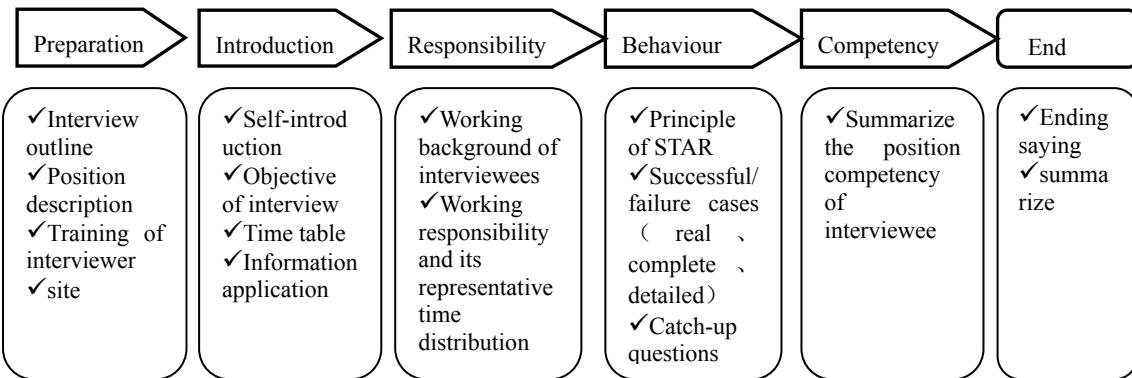


Figure 1 The General Process of BEI

1.5-2h is needed in a BEI interview and 2-4 complete behavioral issues should be collected. This BEI method require high standard qualifications of interviewers, moreover, during the process, interviewer should be rigorous and clear-minded, and what's more, he ought to meet the interview goal, and be capable of raising up catch-up questions to cope with the vague and incomplete information encountered in the interview process.

### 4 Model Coding

After finish the BEI, the process of model coding can be set up.

#### 4.1 Concept and method of coding

The coding segment in the competency model is a method that transforms typical behaviour that collected in the BEI into competency index through subject analysis by coding staff. Subject analysis is a kind of process that analysts distinguish the subject and model from the original material. As shown in the table 1. It requires the coding analyst to have the competency to distinguish concept and establish new concept.

In the coding process, in order to improve the working efficiency and coding quality, usually we don't use subject analysis method to analysis the material directly, while we use common competency

dictionary to reorganize the original material and purify the competency index. If comes to the situation in which we encounter some models that are not mentioned in the competency dictionary, we would analysis, purify and generalize the materials to draw out a new competency index to add into the competency dictionary.

**Table 1 Coding Example of Subject Analysis Method**

Collective material	Subject	Competency Index
Being a management staff, management means not only dealing with our own stuff well, however, we should have a kind of ability to let employee to tackle the things by themselves—teach them the fishing method rather than giving them the fish instead, that is to say, you should know how to pass down your experience as well as your competency at the same time, and it is of great significance.	Focusing on the competency development of employees and love to share the experience with employees.	Intend to teach
We have to do some communication work sometimes. Although its great significance, it should be done in private rather than in the meeting. I recall that once I treat both my technologist and section chief. And it was in the dinner time, we all have a great communication, and reached some consensus. There were both great movements indeed.	Using deferent conduit to collect information in order to solve the problems.	Effective communication

#### 4.2 Coding principle

Before the coding, firstly, we should make judgments that whether the material can be coding or not. So we that could distinguish which can be coded and which can not based on the coding principles.

##### 4.2.1 Can-be-coded information

The information that can be coding should meet one of the follow standards:

- (1) Interviewee self-experienced and completed specific behaviour;
- (2) Interviewee description is supportive by complete specific behaviour;
- (3) Interviewee behaviour strategy and typical model when they dealing with their job.

The information that doesn't meet one of the above principles can not be coding.

##### 4.2.2 Common cannot-be-coded information

(1) The content includes first person plural form (we), which makes us hard to distinguish interviewee's role play in the team behaviour;

- (2) Vague information which have no specific behaviour to support;
- (3) Not completed behaviour;
- (4) Ideals and thoughts that have no behaviour or evidence to support;
- (5) Interviewee's summarize and introspection;
- (6) Information which contains which contains manifestly contradictory.

When encounter with such kind of information that can not be coded in the process of coding, interviewers should immediately raise up catch-up questions until the collective information is clear, detailed and complete.

#### 4.3 Process of coding

##### 4.3.1 Establishment of common competency dictionary

Firstly, we should collect the published common competency dictionary widely, which includes from home and abroad, as well as from the same field. For example, some classical pieces like Spencer's common 21 characteristics of competency dictionary, DDI competency dictionary, and some successful enterprises' competency dictionary, etc are all great. Secondly, we should filter the second-hand index and compound some of them if needed and make sure the uniqueness of the final index based on the peculiarities of the goal enterprise and its position. At last, decide the concept and classification standard of the final index, and make clear explanation of each rank standard, making sure the understanding easiness for coding staff.

##### 4.3.2 Generalization of interview materials

At first, enter the interview record into computer, generalize them into manuscripts. This kind of job though easy but requires large energy pouring, since usually an hour interview record can generate into about 10,000 words manuscript. Then we need to do the first filtering job with the manuscript to cut out the unsuccessful interview.

For the convenient of coding job, manuscript should be generated into unified form, table 2 shows one example form standard of coding material.

**Table 2 Formation of Coding Material**

Interview content	No	Name	Rank	Remark
I have a habit, I always set up a big goal for myself, and at the same time set a small objective.				
The realization of these small stage goals are for self-motivation,				
To win myself a kind of achievements, and to prove my ability.				
This is a kind of improvement habit I have kept for a long time.				

#### 4.3.3 Experimental coding

The quality of coding job really depends on the competency of coding staff. So for the best, he should have some psychological background for the best. And the coding staff can be the interviewer or other as well. Before the formal coding, we should train the coding staff in advance, and the objective of the training is for coding staff to have a better understanding of the common competency dictionary, moreover, develop relatively coordinate understanding of each competency index concept.

Coding training can apply interactive pedagogy, letting trainees to learn and discuss the common competency dictionary, and then randomly select two interview texts for coding staff to code individually for the examination. After the coding process, trainees should have a discussion on the results of experimental coding process, especially the differentiation parts, besides, they should train repeatedly until they can developed highly consistency of their coding consequences. This consistency is indeed the coding reliability, which is the consensus degree of the different coding results of the same coding texts. Coding reliability is measured by category agreement (CA) index: the ratio of the number of identical index that originated from the same interview text and the number of whole coding index. The identical category here not only means they are all categorized into the same competency index, but also means that they also should be in the same rank as well.

The specific calculation formula is followed:

$$CA = 2S / (T1 + T2) * 100\% \quad (1)$$

S means the identical index number categorized by judges, T1 means staff A's coding number, T2 means staff B's coding number.

For example, when two coding staff's coding number is representatively 56 and 49, and the identical index number is 28, so the CA will be:

$$CA = 2 * 28 / (56 + 49) * 100\% = 53.3\% \quad (2)$$

It indicates that the category consistency of these two coding staff is relatively well, but it still need some further discussion and practice till they can be qualified for the formal coding job. On the other hand, we could also hire some extra high CA index score staff to do the formal coding job. Usually, the ratio of one and the other trained coding staff's CA index score should higher than 70%. In the competency research abroad, CA index scores are usually between 0.74~0.88<sup>[7]</sup>.

As long as the coding staff's CA scores reach a high standard, the formal coding job can begin.

#### 4.3.4 Formal coding

If the human resource and time is sufficient, we can organize a two member group to analysis every interview material to purify competency. On the contrary, if the human resource and time is limited, individual coding staff (means one member a group) is also allowed.

As coding independently, every coding staff is supposed to analysis the interview independently. Coding staff should read the interview material line by line, coding once whenever the competency feature appears, and write remarks beside the purified competency index which including the name and rank. Sometimes, one behaviour or advice can be coding repeatedly, for instance, maybe one behaviour model can be categorized into achievement orientation competency as well as influence competency. What is more, coding staff should mark the uncertain index at the same time.

After the independent coding ends, coding group should immediately discuss, category and amend the coding results, the thing that they mainly discuss about are the disputed points that they marked in the process. What's more, they should also exchange ideas about the new added competency index, comparing with competency index that embodied in the competency dictionary, they can determine whether it can be capped with the new title or not. And when comes to the situation that two staff describe the same competency index with two different descriptions, they must reach an agreement to a

unified name and then generate its concept and rank.

#### 4.3.5 Statistic analysis

After the accomplishment of coding work, a differentiation analysis of its coding grade is needed between the excellent group and the normal one in order to determine which competency index can be embodied into the final model. The statistical content is the respective appearance frequency and the rank of competency index from excellent group and the normal one. Most of the time, for the low frequency index, they can be canceled directly. Usually, we use frequency or average rank point as parameters, and choose the parameters that have little association with the interview length (these index are relatively stable) to exam themselves by T method. And at the same time there are also cases that use frequency and average rank point as a combination to exam the parameters. Select those differentiation examination indexes as the prepared index for the model establishment.

After the analysis, the draft of competency model can be draw. Ultimately, with the examination consequence of the model and high-rise interview advice, slightly amend of the draft can yield the final competency model.

## 5 Conclusions

This paper specifically analysis the key technologies in establishing the competency model—the method of coding, principle and operative process. For the information we collected by applying BEI, we should be careful in distinguishing which information can be coded and which can not. The specific coding process mainly classified into five stages: establishment of common competency dictionary, generation of interview materials, experimental coding, formal coding, and statistical analysis.

Because the coding technologies are complex, which associated with cognitive psychology, behaviour psychology and statistical knowledge etc, so coding staff should receive professional training and practice repeatedly in order to achieve better performance.

In the light of high reliance of the highly qualified coding staff for the quality of coding, so the subjectiveness is inevitable. At present, some consultant firms are referring to their application of qualitative research software Nvivo (analysis tool software for qualitative research developed by Australian OSR International company) to coding analysis the interview material, while there are authors bring forward the idea that using content analysis method to analysis the BEI texts based on causality diagram, howbeit the effect of this kind of coding method still need more practice and time to exam<sup>[6]</sup>.

The research documents about the coding technology of competency model are relatively few, which requires further research of some segments in the practical operative process, for instance, the research about how to eliminate the effect of subjectiveness of coding staff for coding job.

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