

Analysis on the Impact of Knowledge-based Employees' Competency on Performance in E-commerce Enterprises

Qinghua Hu

City College of Science and Technology, Chongqing University, Chongqing, China

501349789@qq.com

Abstract. Based on relevant literatures and questionnaire surveys, this paper constructs the competency model of knowledge employees in e-commerce enterprises through empirical analysis. The research results indicate that there is a significant positive correlation among personal characteristics, knowledge attainment, professional ability, thinking ability, cooperation ability, innovation ability, relationship performance and task performance. Different dimensions of competency have different levels of influence on individual performance. Personal characteristics and cooperation ability mainly affect relationship performance, while intellectual equipment and professional ability task performance.

Keywords: E-commerce Enterprises; Knowledge-based Employees; Competency; Performance.

1. Introduction

At present, all walks of life in China are gradually stepping into the Internet era with the emergence of new forms of economy and business represented by "Internet Plus", Big Data and Artificial Intelligence and so on. In this context, Internet e-commerce enterprises is springing up like mushrooms and ushering a new opportunity for development, which shows a good trend of development. According to "the 41st statistical report on the development of Internet in China" released by China Internet Network Information Center (CNNIC), the number of Internet users in China has reached 772 million with an increase of 5.6% over 2016, and the Internet penetration rate has reached 55.8% which is 4.1 percentage points higher than the world average (51.7%) by the time of December 2017[1]. That is to say, the expansion of the Internet users scale has promoted the development of e-commerce enterprises and increased Internet's demand for talents, which shows a thirst for talents of knowledge employees equipped with Internet genes.

Competency research has been a hot topic in the field of human resource management at home and abroad. The core competitiveness of e-commerce enterprises focus on knowledge-based employees. Therefore, improving the competent level of knowledge-based employees is not only the subjective needs for individual career development, but also the objective requirements for enterprises to maintain their competitive advantages as well as a significant guarantee for their benign development. Throughout the current academic world, there is almost no research on the competence of knowledge-based employees in the field of Internet e-commerce, which would make a negative influence on the rapid expansion of personnel in developing e-commerce enterprises. Hence, this paper studies the competency of knowledge employees in e-commerce enterprises based on relevant research and empirical analysis, which is of great significance both theoretically and practically.

2. Literature Review on the Competency of Knowledge Employees

2.1 Definition of Knowledge Employees and their Characteristics

In recent years, the Internet e-commerce industry has been vigorously promoted to make a longitudinal development and showing a good momentum under various e-commerce policies and infrastructure's improvement and the consumer market's upgrading. In China, e-commerce enterprise has become a vital driving force for powering national economic growth and social development. As a knowledge-intensive and technology-intensive enterprise, if an e-commerce enterprise wants to stand out in a complex business environment and gain a competitive advantages, the critical point lies in the reserve of knowledge-based talents. Compared with the real economy, the rapid development

of e-commerce enterprises depends much more on the knowledge investment and technological innovation on knowledge employees. Knowledge-based employees equipped with high technology, education and accomplishment are the core competitiveness for e-commerce enterprises, the key worker for enterprises to create wealth, and the significant figures for enterprises to maintain steady development. In this context, it is necessary to study knowledge-based employees in e-commerce enterprises. Scholars at home and abroad have defined the concept of knowledge-based employees from multiple perspectives, as shown in table 1.

Table 1. Summary of concept definition for knowledge workers

classification	scholar	Concept definition
Foreign scholars	Christian(1997)	A person who creates value by means of information in a knowledge-based industry
	Frances Horibe(2000)	A group of people that are good at replacing physical labor with mental work and bring added value to products through their own unique creative design
Domesti scholars	Jun Li(2007)	A group of people that master and use symbols and concepts, use knowledge and information as a means of earning a living and replace physical labor with mental work
	Wei Lv,Wei Tang (2012)	The group who is rich in learning, innovative ability and higher quality, which create benefits for enterprise in mental work
	Juan Wang(2018)	A innovative and independent man who realize capital appreciation for an enterprise by means of knowledge and information

Based on the research of scholars at home and abroad, this paper reaches a conclusion that knowledge employees in e-commerce enterprises refer to those who have received higher education, equipped with higher knowledge and technology, possessed a strong learning ability and innovative spirit can bring knowledge capital appreciation to e-commerce enterprises through their creative brainwork. There are two types of knowledge-based employees in e-commerce enterprises in this paper. One is knowledge-based employees on management who have abilities of strong planning, organization, leadership, coordination, control and innovation, such as e-commerce operators and market personnel. The other is technology-oriented knowledge workers who are engaged in the research work of information technology, such as designers, engineers and so on. According to the definition of e-commerce business enterprise knowledge staff, we can see that it is the characteristics different from ordinary employees that the high education vision, strong ability to adapt, career decision-making ability, strong learning ability and innovation ability, high resilience, strong team cooperation ability, strong communication skills, emphasizes on the pursuit of the realization of self-worth, clear career planning, with sufficient space for development etc.

2.2 Research on the Competency of Knowledge-based Employees

In the theoretical field, there are different definitions of competency in which Spencer (1993) is the most representative one. In his opinion, competency refers to the individual potential characteristics[2], such as self-cognition, individual characteristics, motivation, values and so on, which can distinguish excellent performers from ordinary ones in a certain position[2]. In view of the

authority of this definition, this article also adopts the definition. Subsequently, the quality assessment research based on competency has been widely researched by scholars at home and abroad, which has become a key standard to obtain core employees in the field of human resources.

As for the foreign research status, McClelland[3] (1973) firstly proposed the notion that competence, instead of intelligence, is the personal characteristic that distinguishes the performance levels in his article "Testing for Competence Rather than Intelligence". Nilan[4] (2000) constructed a global executive leader competency model involving three dimensions and 12 factors with the example of 3M company. Alec Levenson[5] et al. (2006) showed that the high level of managers' competence was positively correlated with enterprise's and individual performance. In addition, domestic scholars have also carried out a lot of studies. Wang chongming and Chen minke[6] (1999) obtained the difference in competency characteristics of managers at different levels through structural equation model analysis. Wang hongjun and Chen jin[7] (2007) analyzed entrepreneurs' entrepreneurial competence with the help of behavioral event interview method on the basis of Thomas W.Y. Man's research, which they found that entrepreneurial competence of technology entrepreneurs includes eight dimensions, such as opportunity, relationship, concept, strategy, commitment, emotion and learning and so on (zhang wei, wang chongming, 2004). Du Juan [8] (2009) conducted an in-depth study on managers' competency in different industries and at different levels of management, which verified the correlation between managers' competency and work performance. Dong xiaolin and Ma lianjie[9] (2013) established the competency model of university administrators by means of behavioral event interview. The results indicate that education horizon, learning adaptation, knowledge attainment, peer relationship, professional skills, democratic responsibility, influence and personality characteristics have different degrees of predictive effect on the performance of administrative personnel. Feng hongying[10](2015) constructed the competency model for senior executives of state-owned enterprises through factor analysis, which mainly including business knowledge ability, team management ability, customer service ability, interpersonal communication ability and psychological debugging ability.

3. Research Design

3.1 Scale Design

The questionnaire design of this paper includes three parts. The first part measures the demographic characteristics of knowledge employees through four questions, namely, gender, age, education background and working years; The second part is the competency assessment scale in which 20 competencies of knowledge employees involving 6 dimensions are finally extracted through the behavioral event interview and the evaluation of the expert group, which are 5 competencies of personal traits (self-confidence, responsibility, initiative, resilience and optimism); 3 competencies (professional technical knowledge, experience accumulation, management ability); 3 competencies (career decision-making ability, information collection ability, hands-on ability); Thinking ability latitude 3 competencies (comprehensive analysis ability, logical analysis ability, divergent thinking ability); 3 competencies (communication, insight, teamwork); 3 competencies for innovation ability (continuous learning ability, driving change, achievement orientation) respectively. The third part is the personal performance measurement scale. Based on the research results of wang hui and li xiaoxuan[11] (2003), personal performance is reflected in relationship and task performance. The item in the relationship performance measurement's refers to the research results of Van Scotter&Motowidlo[12] (1996), while the task performance measurement's item refers to the research results from Han yi and Liao jianqiao[13](2007).

5-point scoring method of Likert (1932) was adopted in the scale, which the respondents need to answer the problem in the form of "one out of five" according to the actual situation.

3.2 Data Collection

In this study, questionnaires were distributed from the questionnaire star professional website. A total of 250 questionnaires were issued to e-commerce enterprises, 182 of which were valid with a

valid recovery rate of 72.5%. The sample demographic information is shown in table 2. The questionnaire is mainly distributed to knowledge-based employees of e-commerce enterprises in Chongqing, involving enterprises such as Chongqing jijiyuan technology co., LTD., Chongqing huizhan network technology co., LTD., Chongqing youlu technology co., ltd. and Chongqing taochuang technology co., LTD.

Table 2. sample demographics

Demographic information		sample number	Percentage
sex	man	77	42.31%
	woman	105	57.69%
age	Aged 25 and below	82	44.87%
	26-35 years	79	43.59%
	36-45 years	16	8.97%
	Aged 46 and above	5	2.56%
educational status	junior college	33	17.95%
	undergraduate course	100	55.13%
	Master	42	23.08%
	doctor	7	3.85%
working life	Within 2 years	68	37.18%
	2-5 years	56	30.77%
	6-10 years	44	24.36%
	More than 10 years	14	7.69%

4. Results and Analysis

4.1 Reliability and Validity Analysis

In terms of reliability checkout, Cronbach's alpha coefficient is usually applied in the detection. As shown in table 3, Cronbach's alpha coefficient of the 6 latitude and the overall scale are greater than 0.8, indicating that the scale has a very good reliability.

Table 3. Reliability test of each factor

variable	coefficient of Cronbach α	Item number
individual trait	0.912	8
Knowledge literacy	0.858	3
vocational ability	0.872	6
ability of thinking	0.901	5
Cooperative capacity	0.943	8
innovation ability	0.881	6
Total quantity table	0.978	36

In terms of validity examination, it is usually composed of content and construction validity. This paper's scale is modified from the mature scales at home and abroad to ensure the content validity of the scale. Factor analysis is generally used to test the construction validity. The results are shown in table 4 with KMO=0.895>0.8, Bartlett sphericity test significance with p=0.000, and the sample is suitable for factor analysis. The orthogonal rotation of maximum variance was carried out by principal component analysis, six factors with characteristic values greater than 1 were extracted. The

cumulative variance contribution rate was 75.671%, indicating that the scale had good construction validity.

Table 4. Inspection of KMO and Bartlett

KMO value		0.895
Approximate chi-square		2863.176
Bartlett sphericity test	df	630
P value		0

4.2 Descriptive Statistics and Correlation Analysis

Table 5 shows that the average competency of knowledge-based employees in e-commerce enterprises is 3.991, indicating that the overall competency of knowledge-based employees in e-commerce enterprises is slightly higher than the average level in the same industry. After sorting score by its size, competencies at six dimensions of e-commerce enterprise knowledge staff are cooperation ability, personal qualities, innovation ability, thinking ability, knowledge accomplishment, professional ability with the corresponding mean score of 4.058, 4.043, 4.032, 3.964, 3.936, 3.964, suggesting that e-commerce enterprise’s knowledge staff competency attaches great importance to the cooperation ability, personality, ability to innovate, but they needs to improve their professional ability.

There was a significant positive correlation between the competency of and individual performance ($p < 0.01$) for knowledge employees in e-commerce enterprises. Thereinto, relationship performance is highly related to team cooperation ability, innovation ability and personal characteristics, while task performance is highly correlated with personal characteristics, professional ability, cooperation ability and innovation ability. This also means that the competency level of knowledge employees in e-commerce enterprises has a certain impact on the generation and strength of their personal performance.

Table 5. Mean, Standard deviation and Correlation coefficient

	Average Value	Standard Deviation	Individual Traits	Knowledge Literacy	Occupation Ability	Thinking Ability	Relationship Ability	Innovation Ability	Relationship Performance	Tasks Performance
Individual Traits	4.043	0.718	1							
Knowledge Literacy	3.936	0.817	0.800**	1						
Occupation Ability	3.915	0.667	0.813**	0.826**	1					
Thinking Ability	3.964	0.767	0.806**	0.738**	0.820**	1				
Cooperation Ability	4.058	0.764	0.825**	0.669**	0.798**	0.888**	1			
Innovation Ability	4.032	0.697	0.803**	0.702**	0.770**	0.822**	0.865**	1		
Relationship Performance	4.079	0.866	0.810**	0.677**	0.762**	0.764**	0.839**	0.827**	1	
Tasks Performance	3.968	0.873	0.846**	0.711**	0.824**	0.777**	0.808**	0.806**	0.859**	1

Notes: * denotes $p < 0.05$; ** denotes $p < 0.01$; the same as follows

4.3 Regression Analysis

Six latitudes of competencies were taken as independent variables and two latitude of personal performance as dependent variables for linear regression analysis with significant standardized regression coefficient ($P < 0.01$). Relationship between the regression result shows that the performance of six competency latitude all entered the regression equation, in which F test had a

significant role ($F = 42.697, P < 0.05$), including personality, ability to cooperate with the biggest contribution on relationship performance and the corresponding Beta coefficient of 0.469, 0.367, followed by knowledge accomplishment, thinking ability, professional ability and innovation ability with corresponding the Beta coefficient were 0.272, 0.257, 0.236, 0.191 and their common predicting the amount of 78.3% of the relationship between performance variation model better explanatory power on relationship performance. Six competencies of task performance latitude also all entered the regression equation, and F test had a significant role ($F = 45.383, P < 0.05$), in which knowledge accomplishment, professional ability has contributed most of task performance, the Beta coefficient of 0.389, 0.376, followed by thinking ability, innovation ability, personal qualities and ability to cooperate, the Beta coefficient were 0.373, 0.254, 0.254, 0.208, their task is to predict the performance of 79.3% of the variance, model good explanatory power on task performance.

Table 6. Regression Analysis of Competence to Individual Performance (N=182)

Performance Indicators	Cooperation Ability	Innovation Ability	Knowledge Personality	Individual Characteristics	Thinking Ability	Professional Ability	R ²	F
Relationship Performance	0.367	0.191	0.272	0.469	0.257	0.236	0.783	42.697**
Task Performance	0.208	0.254	0.389	0.254	0.373	0.376	0.793	45.383**

5. Conclusions and Suggestions

This paper aims to explore the adaptability of competency model for knowledge-based employees in e-commerce enterprises in China's enterprise practice and verify the relationship among personal characteristics, knowledge literacy, professional ability, thinking ability, cooperation ability, innovation ability and personal performance. Based on the analysis of the regression model, the following conclusions can be drawn : (1) the competency of knowledge-based employees in e-commerce enterprises affects individual performance and there are significant positive influences between the competency characteristics of six dimensions and the performance of relationship and task. (2) different competency dimensions have different levels of influence on individual performance. Personal characteristics and cooperation ability mainly affect relationship performance, while knowledge literacy and professional ability task performance.

Through empirical research, it can be concluded that competency has a stimulative effect on individual performance, that is to say, the higher the competency of knowledge-based employees, the better the performance of e-commerce enterprises will be. Therefore, this paper proposes two proposals on how to improve the competence of knowledge-based employees.

(1) Consummate the human resource management system of the enterprise. After introducing competency model, establish scientific and effective human resource management system which covers employee recruitment and allocation, training and promotion, performance evaluation, etc. To begin with the competency model system should be taken as a reference for the evaluation criteria in the process of talent selection. Prepare job descriptions based on its characteristics and competency requirements, execute competency analysis, and select qualified employees. In addition, determine the training needs and improve the pertinence of employee training. Based on the competency model, the training content is extended to professional literacy, professional cognition, interpersonal insight, continuous learning ability, judgment and decision-making ability and other aspects of deep competency, as well as the implicit competency is trained. Meanwhile, we should pay attention to the diversity of training methods during the process of training. At last, a performance appraisal system based on competency model should be established to measure the performance and competency of knowledge-based employees in an all-round and multi-level way. Here is the process. Firstly, performance objectives are set and traceable performance indicators are developed according to the competency model. Secondly, implement performance guidance, continuously track and monitor progress, and update performance goals regularly. Implement performance appraisal again, and focus

on finding out the gap between actual work and competence, so as to provide basis for rewarding and punishing performance. Finally, timely feedback performance, peer assessment and superior assessment, implementation of performance assessment results, timely performance communication can be done through self-assessment.

(2) Establish the learning organization for e-commerce enterprises. Firstly, under the learning organization, the staff not only can practice the concept of lifelong learning, but also can confirm their competency gap with the full realization on their own advantages and disadvantages, which consciously raise and leak fill a vacancy and thus to raise their level of competency as a result by means of individual learning, practice participation and teamwork learning. Secondly, enhance the construction of enterprise culture and build harmonious internal relations. It can not only prompt the cohesion of the team, but also improve employees' interpersonal skills, relationship maintenance ability and others in-depth competency characteristics with the aim of ensuring a win-win situation for the growth of enterprises and employees. Thirdly, establish a good talent growth mechanism to provide good development conditions for knowledge-based employees. Design career planning for employees, assist employees to improve their career choice based on various competency factors, and direct their career development action direction.

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