Talent Competence Under Transformation and Upgrading of Logistics Industry in Beijing, China

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Abstract. With the business transformation and upgrading in logistics industry, the requisition of talent competencies has changed in recent years. It's important to identify the talent competence for supporting development of the industry. This paper used mixed method such as content analysis and questionnaire survey. Data was processed with the statistical tools of Factor analysis and variance analysis. As a result, a general competence modal was set up and the new requirement for talents' competencies was identified.

Keywords: logistics industry · transformation and upgrading · general competence modal

1 Introduction

The success of an organization hinges on how to attract, develop and retain talents with right skills and capabilities (Carter and Carter, 2007) [1]. The change of work contents requires the establishment of new talent competence standards (Kotzab et al., 2017) [2]. For logistics industry, the requisition of talent competencies has changed in recent years owing to profound business transformations such as the globalization of supply chains, continued outsourcing, and the widespread adoption of lean practices (Christopher, 2012) [3].

Industrial transformation and upgrading are the necessity of national economic system reform and industrial structure adjustment in China. Under the promotion of the market and the guidance of the government, the transformation and upgrading of the logistics industry is a process of continuous innovative development from labor-intensive to knowledge-intensive (Wang, 2014) [4]. Logistics industry in China has basically realized the upgrading of specialization and innovative development. Major market segments vigorously develop such as e-commerce express logistics, cold chain logistics, international logistics, logistics information and automation, supply chain management, which meets the demand of new retail model and high-level manufacturing industry. A few new segments such as intelligent logistics, international logistics, and supply chain management service need professional talents urgently and provide higher salary according to a report of a consulting corporation.

Research shows that logistics and supply chain management competencies have significant effect on business performance and financial success (Bowersox et al., 2000) [5]. Clarifying new talent competencies is necessary to guarantee fast and sustainable growth of the logistics industry in China. The needs of high-quality talent development and efficiency improvement as one of the main propositions of the "14th five-year plan" human resources planning.

The purpose of this study is to examine the question of what core competencies are necessary for logistics talents in the changing context of the logistics industry and organizations in Beijing, China. To achieve this research objective, two questions are to be answered: what the new work contents in the changing industry and what competencies are the most necessary.

2 Literature Review

2.1 Definition of Competence

McClelland (1973) [6] first defined competence as a personal characteristic that can distinguish the performance level in a specific job position and organizational environment. Later, Spencer and Spencer (1993) [7] put forward a more comprehensive definition, that is, competence refers to the fundamental characteristics that affect standards and performance in work, which can be motivation, talent, knowledge, skills, self-concept, etc. McClelland addressed that those potential and general internal motivation, traits, attitudes, or values play a decisive role rather than shallow and special knowledge and skills. He refined 21 general competencies to form the initial "dictionary of competency model".

Based on former research, Kotzab et al. (2018) [2] identified four types of competences. Professional competences comprise knowledge and skills specific for a profession or position. Methodological competences are the capability to apply methods for more effective and efficient working results including handling and systemizing information, problem-solving, creating solutions and decision-making. Social competences refer to soft skills involving those competences subsume group- and relationship-orientated behavior, communicative behavior, cooperative behavior, assertiveness and the ability to solve conflicts. Personal competences are related to the development of an individual's own personality within a job role including the capability of self-reflection and self-organization to support motivation and willingness to perform.

2.2 Competences of Talents in Logistics Field

Many scholars have addressed the issue the competences in the logistics field. Poist (1984) [8] suggests a successful logistics manager need to master three areas of skills. They are business skills, logistics skills and management skills known as "BLM" framework.

Many scholars use competency model for talent standard analysis in logistics industry and pay high attention to general rather than special competencies. Van Hoek et al. (1999) [9] and Richey et al. (2010) [10] focus on soft aspects of competence only, such as emotional and social skills. Researchers in China proposed competency model of logistics talents including capacity and traits dimensions, such as personal quality, team spirit, responsibility, information collection and analysis ability (Li et al., 2014; Huang, 2015; Zhou & Gao, 2018) [11, 12, 13].

However, in the context of transformation and upgrading, most of the research on logistics talents is to demonstrate the interactive relationship between logistics industry upgrading and talent training (Huang, 2015; Li, 2012; Yan & Li, 2018) [12, 14, 15]. But the system of talent competency elements is not specific. Moreover, there is no research on talent competency modal in the context of transformation and upgrading of logistics industry in Beijing, China.

In terms of the formulation of logistics talent standards at the national level, both the national standard issued by the National Logistics Standardization Technical Committee in 2016 and the national vocational skill standard for logistics service engineers issued by the Ministry of Human Resources and Social Security in 2020 have mainly stipulated professional knowledge and skills. Although these standards can play a direct guiding role in evaluation and training of logistics talents, they lack the general ability and quality that play a more fundamental and decisive role in the selection and employment of enterprises. In the case that the standards of logistics talents change with the industrial upgrading, the general ability and quality have more important guiding significance for the introduction and training of logistics talents. The use of competency tools to specify and refine talent standards is more in line with the current needs.

2.3   Value of This Research

The contribution of this research is to examine the competences from a perspective of logistics industry in changing context. The findings provide a new direction for enterprises to update the human resource structure and develop potential employees.

3   Methods

As for the construction of the competency model of logistics talents, the content analysis based on the existing literature and other data is used for the preliminary selection of competency elements and model construction, and then the statistical analysis based on the questionnaire survey is used for the selection of competency elements and model verification. This paper starts with analyzing the changes in the core work fields and work contents of logistics in the context of industrial transformation and upgrading. A combination of qualitative and quantitative methods is used to build a general competency model for logistics talents.

3.1   Sampling of Qualitative Study

Key competences as important factors that describe the abilities to fill a specific job position (Kotzab et al., 2018) [2]. The text of job postings are representations of the required

competences. The transforming and upgrading of the industry drive the changes of logistics business mode and work contents. We focus on fast developing 11 logistics market segments in China including urban distribution, e-commerce logistics, express delivery, contract logistics, international logistics, cold chain logistics, logistics technology, pharmaceutical logistics, intelligence logistics, supply chain management and supply chain finance services. Through collecting job postings of the above 11 segments, 199 job positions from 154 sample companies were chosen. Convenient and stratified sampling was used as these sample companies posted job recruitment advertisement at that time. Positions were chosen evenly from each segment. The proportion of junior, middle and senior positions is 19%, 66% and 15% respectively. Also, job positions cover main categories in logistics companies such as solution and product R&D (19%), business development and marketing (15%), operation (39%), customer service and project management (8%), outsourcing (6%) and others (13%). The proportion of sample positions from each job category and level is basically consistent to the overall distribution of logistics positions. The samples selected are typical and representative.

3.2 Content Analysis of Core Work Fields of Logistics Industry

By content analysis on job description, the tasks of middle positions mostly reflect business changes in the context of transformation and upgrading, which play a key role in the enterprises. The most frequently mentioned jobs include strategic planning, strategy formulation, resource integration and deployment, data analysis, network operation, online and offline expansion, mode design, process optimization, continuous cost improvement, data analysis, standardized management, innovation planning, quality management, etc. the simple and repetitive work contents account for a small proportion. Even the junior job positions show more complex and skilled requirement in tasks, which is highly consistent with the direction of industrial transformation and upgrading.

3.3 Content Analysis of Competency Elements

Through content analysis on job requirements, 30 competency elements mentioned most frequently are preliminarily selected. These competencies are required in 10 or more job postings (see Fig. 1). More than 120 positions require communication, coordination and expression ability. More than 40 positions require stress resistance, data analysis ability, office software application ability, leadership, teamwork, conscientiousness, logical thinking, designing and analyzing ability.

3.4 Sampling of Quantitative Study

A questionnaire survey was conducted on the general competency elements preliminarily selected by content analysis, which were distributed to 70 logistics enterprises in Beijing. 52 valid questionnaires were collected, and the effective recovery rate exceeded 70%. All the sample enterprises are undergoing transformation and upgrading. The largest number of them are engaged in e-commerce logistics, express delivery, urban distribution, logistics information platform and service accounting for 38.46%, 48.08%, 40.38% and 21.15% respectively, which is in line with the main direction of logistics industry planning of Beijing. 63% of the sample enterprises are medium-sized or above; about
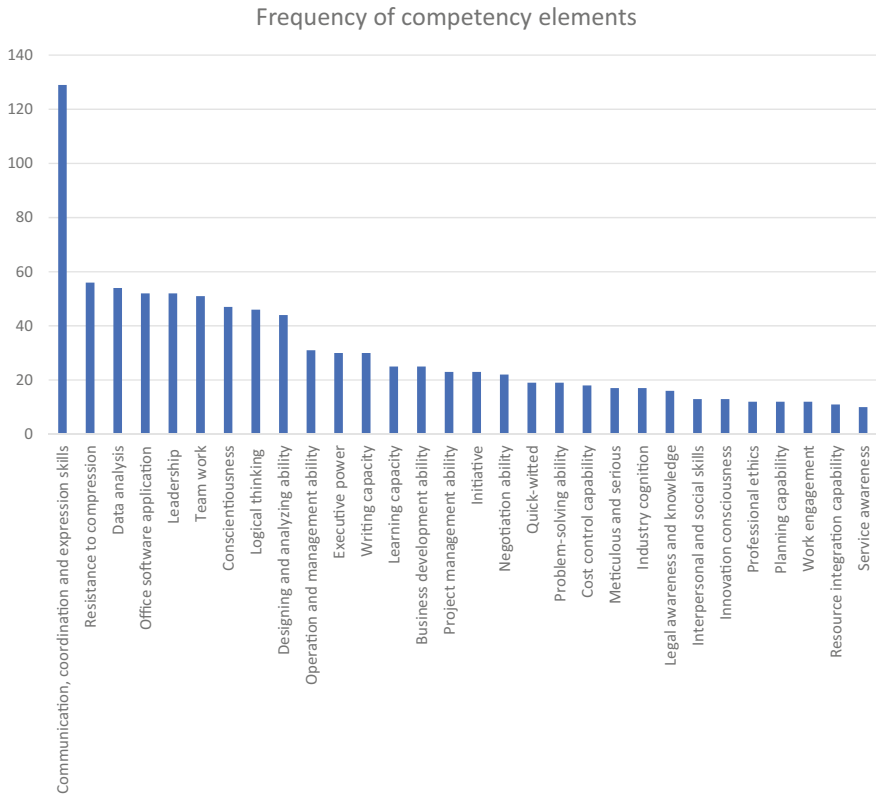
Frequency of competency elements

Fig. 1. Selected competency elements

83% of the interviewees have served for more than 3 years, and about 60% of them are in management positions. The interviewees have a deep understanding of talent competence requirement in this industry. The above sample characteristics show that the sample selection is representative.

3.5 Questionnaire Design and Reliability Analysis

The respondents were required to feed back the basic information of the enterprise and evaluate the importance of each competency element by using the Likert seven level scale, 1 represents the least important and 7 represents the most important. In order to ensure the data quality, it is necessary to delete the recovered questionnaires that have missed the basic information of the enterprise and have not undergone transformation and upgrading.

Reliability analysis of importance scoring data of 30 competencies was conducted. Cronbach αcoefficient value is 0.914, which indicates that the overall reliability is high. See Table 1 for details.

According to "Item deleted α Coefficient value", if executive ability, industry cognition and writing ability are deleted, the reliability coefficient will increase obviously.

While the "CITC value" corresponding to writing ability, executive power, industry cognition, operation and management ability, designing and analyzing ability, resource integration ability and office software application ability is less than 0.4, which has weak correlation with other analysis items and can also be considered to be deleted. The reliability of the research data is higher after the above 7 items are deleted.

Table 1. Cronbach reliability analysis

Items	Correction item total correlation (CITC)	Item deleted α factor
Logical thinking	0.422	0.914
Communication, coordination and expression skills	0.516	0.912
Interpersonal and social skills	0.506	0.912
Quick-witted	0.46	0.913
Executive power	0.22	0.916
Leadership	0.544	0.912
Teamwork	0.501	0.912
Conscientiousness	0.693	0.909
Stress resistance	0.61	0.911
Meticulous and serious	0.696	0.909
Initiative	0.494	0.913
Work engagement	0.716	0.909
Service awareness	0.403	0.914
Professional ethics	0.544	0.912
Industry cognition	0.301	0.915
Learning capacity	0.703	0.909
Problem-solving ability	0.658	0.91
Planning capability	0.403	0.914
Innovation consciousness	0.607	0.911
Data analysis	0.545	0.912
Operation and management ability	0.387	0.914
Business development ability	0.549	0.912
Designing and analyzing ability	0.383	0.914
Resource integration capability	0.362	0.915

(*continued*)

Table 1. (*continued*)

Items	Correction item total correlation (CITC)	Item deleted α factor
Project management ability	0.607	0.911
Cost control capability	0.445	0.913
Negotiation ability	0.411	0.914
Writing capacity	0.164	0.918
Office software application	0.392	0.914
Legal awareness and knowledge	0.481	0.913

3.6 Factor Analysis

In order to examine the selected general competency elements and build a competency model, factor analysis is conducted to extract the principal components. KMO was calculated to be 0.728, greater than 0.6. And the data passed Bartlett's sphericity test (p < 0.05), indicating that the competency importance scoring data fed back by the questionnaire is suitable for factor analysis.

4 Results and Discussion

The results show that 23 competency elements can be classified into 6 factors, as shown in Table 2.

When the absolute value of the factor loading coefficient is greater than 0.4, it can be classified as the corresponding factors. And the cumulative variance explanation rate is 68.775%, more than 60%, indicating that the interpretation of each competency by these 6 factors is generally acceptable.

Table 2. Factor analysis results for competency factors

Competency elements	Factor load factor						Co-determination (common factor variance)
	F1	F2	F3	F4	F5	F6	
Logical thinking	0.519	−0.239	0.229	0.356	0.127	−0.023	0.523
Communication, coordination and expression skills	0.72	0.204	−0.003	0.036	0.222	−0.078	0.617
Teamwork	0.722	0.016	0.157	0.06	−0.011	0.427	0.732

(*continued*)

Table 2. (*continued*)

Competency elements	Factor load factor						Co-determination (common factor variance)
	F1	F2	F3	F4	F5	F6	
Conscientiousness	<u>0.699</u>	0.204	−0.04	0.322	0.352	0.194	0.797
Meticulous and serious	<u>0.622</u>	0.206	0.108	0.455	0.148	0.218	0.717
Work engagement	<u>0.574</u>	0.349	0.2	0.082	0.372	0.172	0.665
Project management ability	<u>0.59</u>	0.166	0.425	0.021	0.239	−0.138	0.633
Interpersonal and social skills	0.294	<u>0.487</u>	−0.043	0.341	0.31	−0.167	0.566
Problem-solving ability	0.333	<u>0.726</u>	0.172	0.292	0.051	0.108	0.767
Business development ability	−0.006	<u>0.806</u>	0.342	0.047	0.249	0.083	0.837
Negotiation ability	0.117	<u>0.785</u>	0.073	0	0.068	0.214	0.685
Quick-witted	−0.067	0.283	<u>0.748</u>	0.164	0.148	0.073	0.699
Initiative	0.377	0.09	<u>0.514</u>	−0.058	0.118	0.375	0.572
Learning capacity	0.341	0.318	<u>0.536</u>	0.245	0.229	0.118	0.631
Planning capability	0.037	−0.247	<u>0.56</u>	0.359	0.298	0.171	0.623
Innovation consciousness	0.458	0.304	<u>0.663</u>	0.15	−0.091	−0.126	0.789
Data analysis	0.143	0.202	0.252	<u>0.715</u>	−0.145	0.452	0.861
Cost control capability	0.01	0.078	0.17	<u>0.651</u>	0.321	−0.005	0.562
Legal awareness and knowledge	0.238	0.119	0.073	<u>0.743</u>	0.163	−0.054	0.658
Leadership	0.193	0.329	0.231	0.161	<u>0.625</u>	−0.114	0.628
Stress resistance	0.359	0.029	0.312	0.132	<u>0.665</u>	0.136	0.705
Professional ethics	0.201	0.131	0.023	0.186	<u>0.788</u>	0.161	0.74
Service awareness	0.101	0.208	0.067	0.077	0.143	<u>0.853</u>	0.811

From the results of factor analysis, the extraction of principal components reflects the requirements for competence in different work scenarios. Factor 1 includes logical

thinking ability, communication coordination and expression ability, teamwork, conscientiousness, meticulous and serious, work engagement, project management ability, mainly reflecting the requirements of professionalism and cooperation ability in daily work scene. So, Factor 1 is named Self-driven and Collaboration Competence. Factor 2 includes interpersonal and social skills, problem-solving skills, business development skills, and negotiation skills, which mainly reflects the competency requirements in external work scenarios. So, Factor 2 is named Development Competence. Factor 3 includes quick witted, initiative, learning ability, planning ability, innovation consciousness, which mainly reflects the requirements for motivation, cognitive ability and thinking mode in innovative work scenarios. So, Factor 3 is named Innovation Competence. Factor 4 includes data analysis capabilities, cost control capabilities, legal awareness and knowledge, which mainly reflects the requirements for general methods, skills and knowledge in business optimization scenarios. They are more professional than other categories, so Factor 4 is named Professional Competence. Factor 5 includes leadership, stress resistance, professional ethics, which mainly reflects the ability and attitude that is more required when assuming the role of leader. So, Factor 5 is named leadership. Factor 6 contains only service consciousness and is named Service competence. Based on this, the talent general competency model under the background of the transformation and upgrading of Beijing's logistics industry was constructed (see Fig. 2).

In order to further verify the applicability of the model, the basic characteristics of sample enterprise size and the importance score of 23 competency elements were analyzed by variance. The results show that there is no significant difference in the scores of 22 competency elements of different sizes. Only the p-value of "Work engagement" was less than 0.05, showing a significant difference with large and small businesses scoring the importance of engagement significantly higher than medium-sized companies. In general, the model has little difference when applied to logistics enterprises of different sizes.

5 Conclusion

According to the above analysis results, under the background of transformation and upgrading, the key development of Beijing's logistics industry has put forward new requirements for the classification perspective and core elements of talent competence.
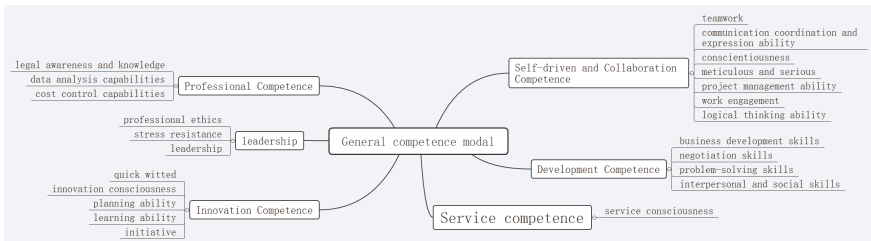

Fig. 2. General Competence Model

5.1 Changes in Competency Classification Perspective

The competency model in this paper contains six types of elements: self-drive and collaboration, service, development, innovation, leadership and professionalism, which is different from the classification perspective of McClelland Competency Dictionary that divides competency elements into achievement and action, help and service, impact, management, cognition and personal effectiveness, and is also different from the perspective of comprehensive vocational ability classified by social ability, methodological ability, and professional ability. Previous competency models tended to be geared towards the measurement or development needs of the competency element itself. The classification perspective shown in this study tends to be oriented to the needs of the application of competency elements in different work scenarios, such as negotiation ability, business development ability, interpersonal relationship and social skills included in expansion ability, which are more needed by enterprises in external marketing, business, sales, resource integration and other work scenarios. This classification perspective is consistent with the connotation of competency serving and affecting work performance, suggesting that building a competency model based on practical application scenarios is more in line with the needs of enterprises in selecting, nurturing and developing talents. Especially in the context of transformation and upgrading, enterprises are facing more frequent and drastic changes in work content and scenarios, and the competency of studying from the perspective of work scenarios is more compatible than the original classification angle.

5.2 Changes in the Core Elements of Competency

First, according to the competency importance score of the questionnaire feedback, responsibility (rating 6.17), teamwork ability (rating 6.13), problem-solving skills (rating 6. 12), business development ability (rating 5.96), service consciousness (score 6.19) rank in the top eight. According to the results of factor analysis, the commonality (common factor variance) of the above five competencies all exceeded 0.7. It shows that they are highly interpreted by various factors and the correlation in the work scenarios corresponding to each factor is high. They are core competence elements that logistics talents need to have, which reflects the need for closer-to-customers service upgrading in the logistics industry, as well as the resulting demand for developing new businesses, new customers and new resources.

Second, Innovation competence includes innovation consciousness, initiative, quick witted, learning ability and planning ability, which reflects the requirements for awareness, motivation, thinking ability, cognitive ability in innovative work scenarios. This is basically in line with the view that innovation competence includes multiple dimensions such as innovation ability, innovative personality, innovative spirit, and innovative knowledge (Zhou et al., 2018) [13]. The emergence of innovation as an independent factor indicates that enterprises are facing more innovative work scenarios in the context of transformation and upgrading. And the composition of innovation competence is comprehensive, which has a positive impact on the selection and cultivation of innovative talents.

Third, the commonality of factor analysis (common factor variance) of data analysis ability is the highest, reaching 0.861. It shows that there is a large degree of data analysis capability requirements in various work scenarios in the logistics industry. In the context of the transformation and upgrading of the logistics industry, the application of big data has become one of the important driving forces, affecting the path choice of supply chain and logistics service upgrading (Ma, 2019) [16]. All kinds of logistics enterprises are increasingly relying on data analysis to support decision-making and improve services.

Fourth, self-driven competence such as conscientiousness and work engagement, as well as the collaborative abilities such as communication and expression, teamwork, project management, and logical thinking, reflect the requirements in daily work of enterprises under the changing environment change from execution to self-management and mutual collaboration. This also reflects that the innovation and development under the background of enterprise transformation and upgrading requires the internal organizational structure to be more flexible and efficient. Project system and small team can be more keenly aware of customer needs and market changes which can encourage employee innovation, so that employees can change from passive work to active responsibility and self-driven (Tai, 2019) [17]. In this case, more employees need to perform project management and team management responsibilities, which requires leadership and coordination ability, and have high professional quality, so the degree and scope of leadership requirements have also increased.

This paper builds a general competency model for talents in the deepening transformation and upgrading of Beijing's logistics industry, which expands the research on competency in the context of specific regions and industries. It proposes to study the competency model from the perspective of work scenarios, enriches the competency theory in the changing environment and provides enlightenment for the selection and training of logistics talents.

6 Funds

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