An Overview of Domestic and International Research on Competency

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As the integrated representation of an individual's characteristics, capacities and personalities, the competence is the foundation of developing management, especially of human resource management. To get better acquainted with competence, this paper first briefly reviewed the development process and latest status of competency study then systematized and contrasted the definitions of interrelated concepts and finally comprehensively investigated the research achievements made by Chinese scholars. The authors also included the exploration of the influencing factors from both internal and external environments of competency followed by a comparison of competency model constructing methods. The main findings were that it concluded the connotation and present foreign and domestic research of competence for supervising management in enterprises in the light of competence. Generally, the authors fought the unresolved problems of competence and deliberated their development trends prospectively.

Keywords: Competency, Model Construction, Development Process

JEL Codes: M54, M21

1. Introduction

It is extensively considered that there is no execution without competency. More than 90% of the Fortune 500 had applied the competency model to their human resource management practices. Overseas research on competency characteristics can be retraced back to the 1870s while it was just introduced into China in the 1990s. In this context, there are a momentous theoretical reference and practical significance for scholars to illuminate the development process of competency research, understand its influencing factors, review and evaluate the latest associative research achievements and develop the methodology of constructing competency model. Generally, the competency research mainly focused on the concept of evolution, driving factors or development trend of specific groups from a micro level (Mao-Xing Cao 2006, Duan-Xu Wang 2006), while the research of from the macro-level is still rare (Xiao-Yuan Li 2015). In addition, they are too one-sided on the selection of the research object, which mainly focus on the characteristics of general competence or management competence characteristics model, with less attention to the difference from domestic and international aspects, not for the research of the general development process or the composition of competence. Therefore, it becomes a meaningful research topic about how competency theory developed is and what the main problem will be in the future research of competence.

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The next section discussed the development process of the competence then section 3 compared different research methods. Besides, section 4 summarized three categories of competency definitions. Section 5 concluded influencing factors of competency from internal and external environments respects. On those bases, section 6 reported two main competence models. After that, this paper analyzed the unresolved problems of competence and deliberated their development trends prospectively.

2. Literature Review of Competency

One of the key reasons for the prevalence of modern competency originated from the Roosevelt Ages for its emphasis on job analysis in human resource management such as identifying and classifying professions, compiling and publishing dictionaries of occupations, instructing various professional required knowledge and skills. The milestone contributions to competency theory are shown in Table 1.

Table 1- Milestone Contributions to Competency Theory

Contributor (Year)	Theory Contributions 【Milestone Significance】
Robert Wyatt (1959)	Proposed the concept of "competency" related to talent identification and personality traits for the first time 【Enlightener】
David McClelland (1973)	Constructed the system with the core concept of "competency" instead of "talent" 【Signal of the formal establishment of competency system】
David McClelland (1972-1973)	Advanced a method to construct competency model: Behavioural Event Interview (BEI) 【Milestone】
David McClelland (1976)	Published a book titled 'Guidelines of Working Competency Assessment' 【Symbol of the successful application of competency theory to practice】
Richard Boyatzis (1982)	Published a book titled "The competent manager: High-Performance Model" 【Initiation of Competency Model Method】

Data Source: Reorganized from Literatures

As shown in Table 1, Robert Wyatt (1963) discussed, for the first time, the relationship between the competency and real social life and set the foundation of application of the competency concept. Therefore, some experts believed that it was under by Robert's enlightenment that David McClelland (1973) constructed the system with the core concept of "competency" instead of "talent" and advanced the famous BEI (Behavioural Event Interview) to construct competency model. Under the guidance of McClelland's work, Richard Boyatzis (1982) generalized 19 items of competency that had certain correlation with improving and maintaining performance management through in-depth investigation. This marked the initiation of competency model method after which time many other scholars have made great contributions. For example, Robert J. Stemberg (1985) proposed the Triarchic Theory of Intelligence. C. K. Prahala & Gary Hamel (1990) also made a point of Core Competency of the Corporation, which integrated organization competency into strategy management perspective.

2.1 Domestic Overview

Through an extensive literature review, the authors found many remarkable representatives of competency research in China such as Kan Shi, Chong-Ming Wang, Hong-Zhang An, Jian-Feng Peng, Shu-Ming Zhao, and Ming-Zheng Xiao, etc. whose achievements laid a solid theoretical foundation (See Table 2).

Table 2- Representative scholars & their works on Competency in China

No.	Represen--tatives	Contribution Evaluation	Contribution	Repre--sentative Works
1	Kan Shi	Forerunner & Greatest Contributor	Overviewed and formulated competency thoroughly	[27]
2	Chong-Ming Wang	Forerunner	Verified competency characteristic structure of the enterprise senior managers	[32]
3	Hong-Zhang An	Promoter of theory and method of Competency	Illustrated the concept, theory, types and methods to construct competency model	[6] [7]
4	Jian-Feng Peng	Forerunner of applying competency model	Described competency model	[22] [24]
5	Shu-Ming Zhao	Promoter of application in practice	Specialized in competency of entrepreneurs and HR managers	[42] [43] [44]
6	Ming-Zheng Xiao	Pathfinder of a new field of competency research	Introduced the competency into standards of personnel quality assessment	[33] [34] [35]

Data Source: Reorganized from Literatures

Kan Shi (2002) and his fellow researchers are the forerunners as well as the greatest contributors of competency research in China. Besides, Chong-Ming Wang (2002) believed that there are two dimensions of management competency characteristic structure including management quality and management skills. Hong-Zhang An (2003) illustrated the concept, theory, types and methods to construct competency model in details. Jian-Feng Peng (2003) along with his research teams applied the competency model into practice of enterprise management consulting comparatively prescient. They expounded the competency dictionary, the process and methods of constructing staff competency model and countermeasures the application problems of enterprise general competency model. Shu-Ming Zhao et al. (2007) evaluated the significance of applying management competency into selecting and appointing enterprise administrators, inquired the origins and development of management competency, and inductively analysed inherent correlations of the major three theories. They also discussed the degree of correlation between levels-differed management competency and job performance and achieved a redesigned human resource management system based on their competency model. Furthermore, Ming-Zheng Xiao (2011) introduced the theory and method of competency into standards of personnel quality assessment of party and government

administration. In addition, there are many other scholars and management consulting professionals that achieved abundant research results of competency.

2.2 Demarcation of Competency

In general, definitions of competence in China and abroad can be divided into three main categories including trait theory, behavioural theory and synthesis theory. As for trait theory, it is widely believed that competence is individual stability and potential characteristics that emphasize on what you possessed. This school's representative scholars are McClelland (1973), Boyatzis (1982), Spencer (1993) and Wang (2000). On the contrary, the behavioural theory, insisted by prominent scholars like Woodruffe (1991), Flercher (1992), Klein (1998), Zhong (2003) and Shi (2002), paid more attention to what the individual did such as having made great efforts to achieve goals, having comprehended thoroughly or having been sensitive to the views of others. As a composite of the first two schools, the synthesis theory focused both on what the individual possessed as well as what the individual did just as Ledford and Byham (1995) and Moyer (1996) declared (see Table 3).

Table 3- Leading Opinions on Competency Definition

School	Scholar	Competency Definition	Limitation
Trait Theory	McClelland (1973)	Distinguish personal characteristics of specific position & environment in different performance levels	Ambiguous, Difficult to identify competency
	Boyatzis (1982)	Potential characteristics possessed by individuals that lead to outstanding performance in certain position	
	Spencer (1993)	Personal deep-seated characteristics used to distinguish outstanding achievers from average performers	Failed to clarify the specific impact of competency on individual behaviour
	Fieishlnan (1996)	Mixture of knowledge, skills, abilities, motivation, beliefs, values and interests	
	Mirablie (1997)	Knowledge, skills, abilities and characteristics associated with high performance	
	Green (1999)	written description of working customs and personal skills that used to achieve certain objectives	Failed to describe detailed behaviour
	Chong-Ming Wang (2000)	Knowledge, skills, capacities, values, individualities, motivation that generated high performance	
	Jian-Feng Peng (2003)	To judge whether a man is qualified for a job	
Behavioural Theory	Woodruffe (1991)	Obvious behaviour categories that can make an Individual competent for a job	Certain competency is neither specific nor observable
	Flercher (1992)	Specific, observable, verifiable behaviours that can be category as a class	
	Klein (1998)	Observable behaviour or behavioural indicator	
	Li-Feng Zhong (2003)	Behaviour characteristics that can distinguish those excellent performers from the flat	
Synthesis Theory	Ledford (1995)	Verifiable personalities, that is, knowledge, skills and behaviour related to excellent performance	Integrate the first two theories
	Byham & Moyer (1996)	Every classifiable behaviour, motivation and knowledge related to work	

Data Source: Reorganized from Literatures

Generally speaking, although many scholars had suggested various definitions of competency, a consensus on competency characteristics was essentially reached in such that competency should be: (1) tightly correlated to work. Competency is associated closely with task context that is dynamic fluctuation and related to the position requirements. (2) positive correlation to performance. There is a close relationship between job performance and competency that can even predict future performance. (3) identifiable. Competency can be used to distinguish outstanding achievers from average performers.

3. Research Methodology of Competency

It can be seen from the Table 4 that each data collection method has its own advantages along with disadvantages. It was widely adopted that scholars would like to integrate a variety of methods of their practical investigation on competency. For example, the complementary combination of observations and surveys or structured interviews can sufficiently counteract the respective disadvantages and refrain from inadvertent omissions of any significant competency.

Table 4- Comparison of Common Methodologies of Competency Data Acquisition

Research Methodology	Advantages	Disadvantages
Literature Review	Fast, easy-to-use, Collect competency preliminarily	Lack of demonstration test, difficult to assess literature values
Focus Groups	Low-cost, fast, informative with intensive and extensive	Beyond operation and time-consuming
Structured Interviews	Veteran interviewers can excavate accurate and comprehensive information based on gesture language	Rigorous requirements for interviewers who would make subjective biases and errors inevitably when conducting qualitative data redundancy
Behavioural Event Interviews	Distinguish insightful information especially in management and interpersonal relationship, applicable to developing exemplary behaviours competency model	Limited sample，time & money consuming,obstinate in past key behaviour events while neglect future requirement or general events
Surveys	Collect massive information anonymously, quickly and inexpensively without regional influence which was more both acceptable by organizations and convenient for quantitative analysis	Limited information coverage, low recovery rate
Observations	high-credibility source, Service to omnidirectional job description and operation modes	Time & money-consuming Extremely restricted by sample size
Work Logs	Integral and identifiable operating logs can provide valuable information appropriate for unobservable, long-distance, expensive investigation	Extreme baldness, complexity, trivialness of working process with unguaranteed sustainability and integrity
Competency Menus and Databases	Seriously straightforward-operating and rapid that can achieve initial competency	Enormous difference of organization environment, culture or key responsibility would limit the extent of application

Data Source: Reorganized from Literatures

Thanks to the development of network technology, scholars developed and applied innovative methods such as Network Delphi, Web-surveys Method supported technically by NetTools into their research. It is the acquirement of high reliability and validity data that authentically achieves the end of competency research. It depends on requirement, environment and condition when selecting the appropriate method.

4. Composition of Competence

Competence is constituted by the following seven elements: (1) Motivation. It is the internal drive that stimulates individuals to take actions to achieve certain purposes. In other words, motivation is the thinking channel activating in your mind when you feel like doing something such as making pots of money overnight. (2) Attitudes. It is the externalization of the comprehensive effect of individual self-concept, values, and social role. (3) Knowledge. In this context, it refers to the professional knowledge required by certain occupational area. For example, institutors are required for possessing pedagogical knowledge as well as specialized disciplinary knowledge. (4) Skills. It is mastery and capability of directing and utilizing expertise just like the managers are supposed to be equipped with word processing and computer application abilities. (5) Traits. Emotional stability and anti-interference ability are individual manners of reaction, propensity and peculiarity of the external environment and multiple information. (6) Social role, such as solidarity and cooperation, is individual perception and interpretation of society. (7) Self-concept is individual perceptive evaluations and judgments upon themselves. For instance, you may consider yourself as the dominant core of certain assignment.

As for the research of competency constitution, McClelland (1973) and Spencer (1993) respectively constructed the Iceberg Model and the Onion Model. The concept of competency was presented by competency model in competency research and application. The competency model is the constitution of a series of competencies to achieve certain performance objective that considered the principal method to discriminate competency. It describes a special combination of specific required knowledge, function and characteristics that effectively assure and serve as a certain role in the organization. To be exact, the pervasive application of competency model established by McClelland & Robert White on position analysis, cadre promotion, performance assessment, and occupational career design has guaranteed the essential portion of modern human resource management research.

5. Influence Factors of Competency

Nordhaug (1994 & 1998) proposed the Competency Classification Theory in perspective of specified context which suggested that three dimensions of competency should be divided into: tasks specificity, corporation specificity, and industry specificity, except that this classification failed to consider all of the situational factors that precisely influence management competency model most significantly. Only when the competency model was constructed and directed to specific situations particularly can it satisfy the practical requirements of organizations. Then what exactly are these crucial factors influencing the management competency structure? After assimilating a lot of relevant scientific papers locally and abroad, the authors predicatively drew the conclusion that there were external, internal and mission environments that determined the management competency structure.

5.1 External Environment

It is inevitable that nearly every organizational administration activities are consisted in as well as relied on the environment in which promotes, supervises and provides essential conditions to management activities to improve management performance. More specifically, it was classified as political environment, economic environment, sociocultural environment and industry environment in this paper.

It is the social attribute of management that accumulated it as one of the significant influence factors of management competency structure. Management, the social activity generated by humanity surviving in certain production relationship and social culture, restricted inevitably by social property. Therefore, it is pre-requisite to equip organizations with corresponding supervisory system in accordance with the situation and function of the overall system of the society to preserve the maximizing flexibility to environment (Guang-Fu Zhu, 2012; Jian-Zhong Li, 2013; Zheng-Zhong Dai, 2013; Li-Bin An, 2013; Wei Li, 2013; Zhi-Qiang Ma, 2013; Ti Zhang, 2013; Yong-Yuan Zhu, 2013).

5.1.1 Political Environment

The political environment consists of social institution, political system, property of governing party, political community governmental policies and guidelines, which is the fundamental cornerstone, however, un-modifiable to organizations. Based on what supposed to be paid sufficient attention to give priority to what the government encouraging, authorizing or prohibiting. Only then can the organizational activities be in line with national interests, acquire government's support and protection and seize the favourable opportunity. Generally, there was lack of relevant analysis on interactive relationship between political environment and management competency structure at present.

5.1.2 Economic Environment

The economic environment, a multicomponent dynamic system, consists of socioeconomic structure, economic development level, economic system, and macroeconomic policy, is the socioeconomic status and national economic policy of organizations for existence. Likewise, the organizational and management status is all depended on its reactive modes and flexibility towards economic environment elements. Therefore, the economic development affects the management competency to a great extent.

It seems that operation and management pattern develops its own way in consideration of a specific economic environment. For instance, it is because of the differences between America and Japan on financial sourcing that their determinative patterns of management strategy, payment system, and administrator promotion are dramatically divergent to each other.

As for new products sales, American enterprises usually adopt the high price strategy to recover capital cost in the short term. Besides, they value recent-high-performed employees as well as those who are expert in making money (Jian-An Chen, 2013; Jin Jin, 2013; Fa He, 2013). On the contrary, Japanese entrepreneurs prefer financing from credible bank loans neglecting immediate interests that emphasize on market penetration strategy and market occupancy by introducing low-price strategy. And they value long-term performance with perspective employees (Xiao-Lin Dong, 2013; Lian-Jie Ma, 2013;

Jian-An Chen, 2013; Jin Jin, 2013; He Fa, 2013; Bin Zhao, 2014; Hong Luan, 2014; Xin-Jian Li, 2014; Xiao-Qiang Bi, 2014; Jin-Yu Wei, 2014).

5.1.3 Sociocultural Environment

The sociocultural environment is composed of geographical fluctuant social stratification, population situation, demotic educational status, social rights structure, religious belief, customs, esthetical sense, and values etc. There were ethics principles and social concept penetrated deep into organizing, conducting, coordinating and controlling in management process which then influenced management competency structure (Jian-Zhong Li, 2013; Zheng-Zhong Dai, 2013; Li-Bin An, 2013; Wei Li, 2013; Jin-YuanZhou,2013; Bing Liu, 2013; Qing Tang, 2013).

On the basis of substantial facts, many management scholars demonstrated that there is a cultural boundary in management. They are all confronted with socio-cultural constraints without exception in multinational companies including power distance, uncertainty avoidance, individualism/collectivism and masculinity. For example, American enterprises attach great importance to individualities while team spirit is emphasized in Japanese companies for all of these differences were caused by the two different socio-cultural environments especially.

In the aspect of cultural differences, the most comprehensive and authoritative research were conducted by Hofstede who believed that the first four factors would exert enormous influence on leadership style, organization structure and incentive mechanism (Peng-Cheng Bi, 2006; You-Min Xi, 2006; Yi-Yi Wang, 2006). Besides, Lian-Cang Xu (1985) insisted that it was moral qualities, interpersonal awareness and character achievement of conductors that composed the Chinese cultural background of leader behaviours. Lei Wang (2014) also discovered that the Chinese management competency structure was closely related to some elements of Chinese cultural tradition, political system and economic system such as favourable lifestyle and family sense of responsibility (Jian Li, 2014; Li-Jun He, 2015).

Therefore, it is essential to regard organizational culture as an initial research influencing element of management competency structure. Above all, the influence of Chinese traditional culture is required to be taken into account especially.

5.1.4 Industry Environment

The industry environment is composed of industrial technology conditions, industrial market stability, product features, concentration degree of industry market and relevant industrial policy environment.

Just as what Nordhaug (1994 & 1998) believed that employee competencies are different though they are in the similar or even same positions since the management modes distinctly vary from different industries. Nandini (2001) also suggested that industry characteristics could be evaluated by industry structure in his research of influence of industry characteristics to CEO professionalism in which introduced four dimensionalities including concentration ratio, capital intensity, product differentiation, and growth rate. Moreover, Deepak & Nandini (2003) focused on CEO's consequence to revolution, openness and strategic sustainability based on the industrial context and discovered that the industry characteristics acted as a buffer function which also adopted the same way of evaluating.

Besides, Chinese scholars like Ji-Cheng Wang & Kan Shi (2002) conducted a empirical research of managers competency in communication industry, which certified that there were ten elements consisted the communication industrial managers competency model adopted to distinguish those excellent performers from the flat, including impact factor, social responsibility, research competence, achievement desire, leadership competence, interpersonal insight ability, initiative, market consciousness, self-confidence and talent-evaluating ability.

5.2 Internal Environment

Boyatzis(1982) emphasized that there is a relationship of mutual penetration and influence between organizational environment and outstanding performance generated from competency that differs from not only positions or responsibilities (Long Ye, 2003; Wen-Jie Zhang, 2003; Wen-Sheng Jiang, 2003). Similarly, Nordhaug (1994, 1998) also approved that it was because of the autologous different culture characteristics that could organization influence management competency structure. In this paper, the authors subdivided the internal environment of management competency structure into organizational property, organizational culture, and organizational life cycle.

5.2.1 Organizational Property

It is the organization property diversity that generated different management objectives, labour relation, and internal operation so as to influence the management competency structure. In this section, the authors contrastively analysed the state-owned enterprises and private firms both in China as well as western countries to explore the influences of organization property to competency structure.

Firstly, considered the management objectives, Chinese state-owned enterprises committed special social function such as employees' medical treatment, house insurance and children's education in addition to pursuing profits. However, Chinese private firms as well as western enterprises attentively focus on getting profitable. Secondly, influenced by historical reasons of Chinese state-owned enterprises, it is accepted that there is a relationship between the owner and its ancestral owners while there is absolute employment relationship only between the opposite labour and the capital in Chinese private firms and western enterprises (Meng Wang, 2013; Rui Tao, 2013; Jing-Peng Li, 2013). In this circumstance, Chinese state-owned enterprises pay more = attention to the management style that regards people as the centre (Wei Li, 2013). Besides, most of the departments of state-owned enterprises are executive agencies instead of decision-making departments. Meanwhile, it is principal of high performance that only the well-deserved interpersonal relationship and harmonious relationship between superior and subordinate can the managers be appreciated and recognized by their superior leaders (Shu-Ming Zhao, 2007; Juan Du, 2007; Ming-Zheng Xiao, 2011; Wei Li, 2013; Meng Wang, 2013; Rui Tao, 2013; Jing-Peng Li, 2013). The discussions above had fully illustrated that the management competency structure would be affected by organization property inevitably.

5.2.2 Organizational Culture

Organizational culture is non-visible but truly exists in any organization and influences organizational behaviours as well as performance that affect various constructions. Sackmann (1991) discussed that cultural cognition and knowledge of organization could change habits applicable for their executors. Those abundant cultural cognitions of past

success and failure could be exchanged and acquired by newcomers in organization (Wei Zhao, 2012; Fen-Fen Lin, 2012; Jie Peng, 2012; Xian-Hua Bao, 2012; Chen Bai, 2012; De-Yi Kong, 2013; Xiang-Qian Zhang, 2013; Jian Lin, 2013; Hui-Xia Rao, 2013).

Besides, He-Yi Song & Dan Zhu (2003) and He-Yi Song & A-Na Liu (2005) conducted an empirical research and discovered that the common comprehensive quality and character trait of high-efficiency managers in different organizational culture environment. It believed that the behavioural style of high-efficiency managers performed as decisive independent and ingenious were inclined to intuitionally receive information, interested in artistic orientation and preferred high-risk decision (He-Yi Song, 2005; A-Na Liu, 2005).

5.2.3 Organizational Life Cycle

The organizational life cycle is a process of growth, maturity and recession since its establishment. Correspondingly, there are the entrepreneurial stage, growth stage, maturity stage and decline stage contained in an organizational development. It is Mason Haire (1987) who initiated the concept of the organizational life cycle that there was stagnation or demise that would attack enterprises whenever administration imperfection damaged their development. That means limitations on the management of an enterprise would eventually limit its development. Different behaviours and characteristics of decision-making in different stages of enterprise developing were determined by diverse resource allocation forms, organization forms and management strategies (Yu-Jun Miao, 2003; Qiu-Sheng Sheng, 2003).

The management competency structure is, in fact, distinctive. For example, the emphases of supervision in the stage of growth are quality of products, quantity of sale, expansion of business and flow of capital. Those foci require that managers be equipped with management competency such as quality consciousness, risk awareness, and operation capacity. However, those who are in the decline stage is supposed to transform their aims into restructuring and survival struggling, which calls for flexible, decisive and enterprising managers.

5.3 Mission Environment

The mission environment indicates relevant procedures of qualifying and accomplishing certain assignments which emphasize the tight interrelation of the post characteristics. The authors strongly believe that the mission environment contains two aspects including administrative level and management function. The essential knowledge and skills of one position may regulate the development of another position (Xin-Bu Hu, 2014; Zhi-Ping Yuan, 2014; Hong Chen, 2014; Lin-Na Hou, 2014; Jian Li, 2014; Jing-Wu Xiao, 2014; Feng Shi, 2014; Zhi-Wei Tian, 2014; Li-Jun He, 2015). Besides, the competency obtained by staff varies from different job Identification and administration level.

Chong-Ming Wang & Min-Ke Chen (2002) indicated that management competency consisted of executive quality and management expertise. But different levels of managers possess various structural elements in specific positions. It is also suggested that value priorities, integrity, consciousness of responsibility and power orientation constitute the management quality dimensions while coordinate the monitoring ability, strategic decision-making ability, incentive command and innovative and exploiting ability from the management skills dimensions (Chong-Ming Wang, 2002; Min-Ke Chen, 2002; Jian-Min Wang, 2012; Mu-Chun Yang, 2012). Ming Feng et al. (2007) illustrated that it is incentive guidance ability of harness of talents and operation capacity that should be paid

more attention to when promoting the administrative middle managers in state-owned enterprises. However, it is the optimistic, self-confidence, interpersonal communication and consociation that achieve the effective indicator of selecting branch secretaries (Mei-Ying Zhang, 2012; Shui-Bo Zhang, 2013; Fei Kang, 2013; Xiang-Fei Li, 2013; Yu-Gai Zhao, 2014; Ru-Zhong Zhao, 2014; Yu-Zhong Lu, 2014).

6 Competence Model

6.1 The Iceberg Model

The Iceberg Model, structured by McClelland（1973）, portrayed competency vividly as an iceberg with dominant characteristics Above the surface and recessive characteristics underwater. It advocated five ingredients of competency including revealed knowledge and skills and those hidden under the surface such as social roles, self-concept, individuality and motivation which were untouchable and difficult to transform or develop (see Figure 1).

Figure 1. The Iceberg Model. Image: MeClelland, DC 1973, 'Testing for Competence Rather than for Intelligence', American Psychologist, Vol. 28, No. 1, pp. 31-42.
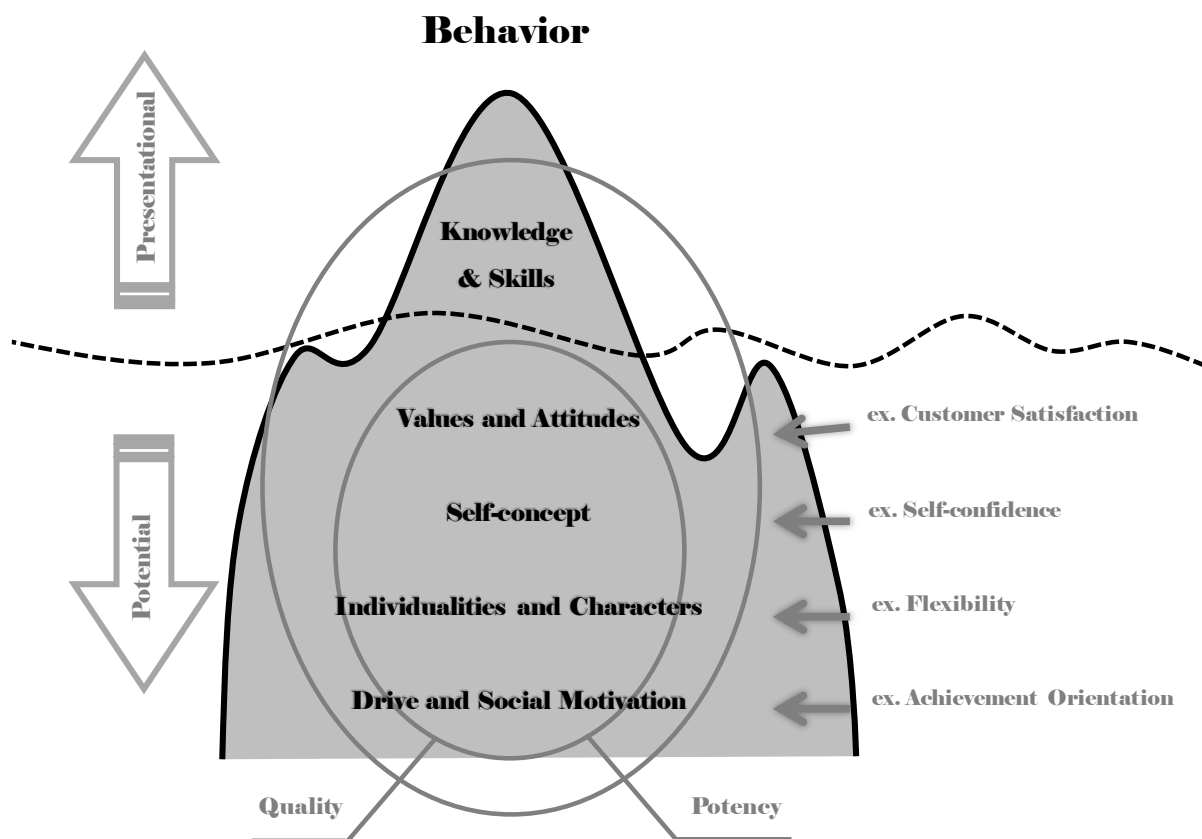

As is shown in Figure 1, parts of the iceberg that exposed outside the surface were unable to explain why outstanding performers achieved their success. Instead, those that hidden below the surface were critical factors that help to illustrate the reasons for high performance. Moreover, those hidden deeper below the surface were more difficult to observe or measure even though they significantly influence performance (McClelland D.C., 1973).

6.2 The Onion Model

Spencer et al. (1993) transformed the Iceberg Model and promoted the Onion Model that interpreted the constitution of competency from another perspective. The Onion Model reserved six gradations mentioned above and redistricted them into three layers in development (see Figure 2).

Figure 2. The Onion Model. Image: Spencer, M & Spencer SM 1993, 'Competence at Work: Models for Superior Performance', New York: John Wiley & Sons Inc., Vol. 17, No. 2, pp. 18-24.
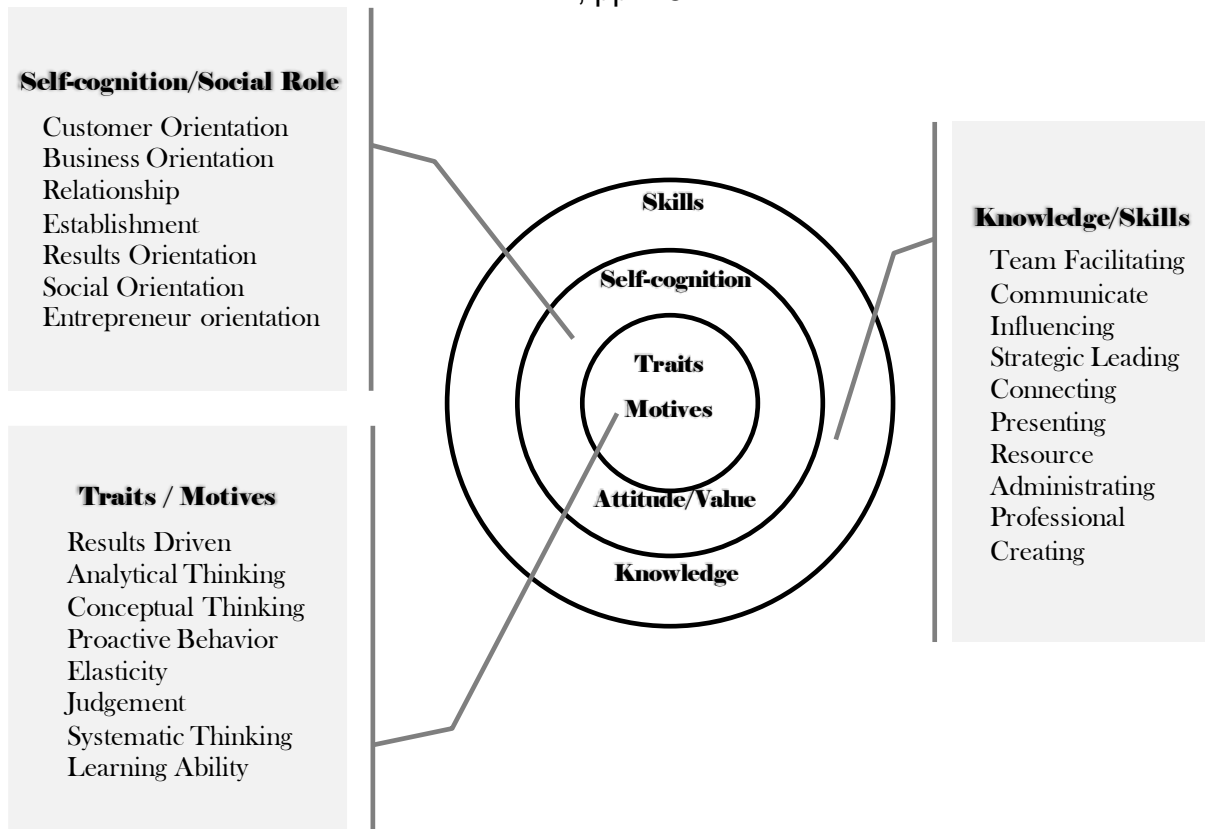
As illustrated in figure 2, the surfaces of the onion were critical knowledge and skills. There were social role and self-concept in the intermediate layer wrapping traits and motivation in the core. Each competency characteristics composed from outward appearance to inner essence. It is anticipated that the deeper the competency inside the onion, the harder it can evaluate or cultivate. (Spencer L. M, 1993; Spencer S. M, 1993)

Regardless of which type of models is used, it is invariably believed that it was indeed the potential, implicit and deep-seated competency that determined the key factors of individual behaviours as well as performances. Besides, based on references from foreign achievements, Chinese researchers established some specific competency application model on account of Chinese social reality such as the Competency Trapezoid Model constructed by Zhi-Gong He et al. (Zhi-Gong He, 2005; Hui Li, 2005; Guang-Lin Chen, 2005), the Competency Pyramid Model and the FPEB Model promoted by Jian-Feng Peng (Jian-Feng Peng, 2005; Jun Liu, 2005; Cheng-Lu Zhang, 2005) and the 3G Theory Model established by Qing-Wei Tong (Qing-Wei Tong, 2001; Shi Qiu, 2001).

7. Conclusions and Prospects

As the integrated representation of an individual's characteristics, capacities and personalities, the competence is the foundation of developing management, especially of human resource management. Therefore, it is absolutely significant to understand its development stage and latest achievements. Therefore, comparing with other researches, this paper investigated competence from a more systematic and integrated level by contrastive analysis, including the development process, demarcation of competency, research methodologies, composition of competence, influence factors and competency models. On the basis of literature review of the development of competency, this paper generalized three main competency theories including the trait theory, behavioural theory and synthesis theory, which explored the connotation of competency from different perspectives. Although there were distinct partialities with regard to each theory, it was the enlightenments and referencing-significance they provided that prod future research. In addition, the authors discussed some remarkable representatives of competence research in China by enumerating their representative works. After that, the authors explored the influencing factors of competency from different aspects of internal, external and mission environments. Furthermore, the authors contrasted different model-constructing methodologies to investigate the merit and demerit of each one. More importantly, the authors suggested that different environmental backgrounds and measured objects should be considered comprehensively and selectively.

To date, the opportunity that professional field of competency assessment increasingly decentralizes has been produced. However, with the emergence of competency research specific to various professional and industrial domains, there exist some inevitable common inadequacies.

In terms of research methods, it is highly suggested that diverse research methodology should be applied synthetically on account of the testing object as well as environmental condition. To some extent, foreign research on competency at the present stage has involved a variety of interdisciplinary domains urged by the integrated utilization of advanced engineering technologies which provide enlightening significance to domestic research. Furthermore, it is competency assessment standards that considered to be established to stimulate future potential research. That is, developing unified adopted measurement scales that pertinently evaluate the competency of professionals from different industries as well as operating positions. Simultaneously, more efforts should be made in constructing competency management system in intra-organizations to apply assessment results of competency to intellectual selection, training and development, motivation, promotion and career development in human resource management.

Generally, competency research still remains at the primary stage of research in China, which involves substantial correlative references with oversea literature. Given that foundation, it is vigilantly required that China's special national conditions of society-environment background, stage of economic development and different requirements of enterprise management also be taken into account to construct reconciling and scientifically rational competency research.

This article also has certain limitations. First, the limitations come from the lack of literatures that the authors researched. Although the authors analysed main research achievements of competence from both domestic and international respects, there still were some interesting researches that the authors excluded; Secondly, the single method

of the research. In further research, adopting a variety of competency model building methods to strengthen the results is well-suggested.

References

Bin Zhao, Hong Luan, Xin-Jian Li, Xiao-Qing Bi & Jin-Yu Wei 2014, 'The active innovation behavior of science and technology personnel: definition and scale development', *Studies in Science of Science, Vol.1, No. 2, pp. 148-157.*

Brill, JM, Bishop, MJ & Walker, AE 2006, 'The competencies and characteristic、required of an effective project manager: a web-based delphi study', *Educational Technology, Research and Development, Vol. 20, No. 1, pp. 115-140.*

Chong-Ming Wang & Min-Ke Chen 2002, 'Analysis of management competency characteristic: test by Amos', *Psychological Science, Vol. 5, No. 2, pp. 513-516.*

Chyung, SY, Stepich, D & Cox, D 2006, 'Building a competency based curriculum architecture to educate 21st century business practitioners', *Journal of Education for Business, Vol. 81 No.6, pp. 307-311.*

De-Yi Kong, Xiang-Qian Zhang & Jian Lin 2013, 'Overview on creative talents research', *Science and Technology Management Research, Vol. 6, No. 2, pp. 123-127.*

Guang-Fu Zhu 2012, 'The matching model construct of human resources management based on the competency', The Exploration, Vol. 6, No. 2, pp. 165-166.

He-Yi Song & A-Na Liu 2005, 'Research on in different organizational culture influence of characters' effectiveness to the leaders', *Journal of Industrial, Vol. 3, No. 2, pp. 23-44.*

Hong-Zhang An & Meng-Jie Wu 2003, 'The competency models', *Occupation, Vol. 03, No. 1, pp. 16-17.*

Hong-Zhang An 2003, 'The establishment and improvement of the position competency characteristic model', *Research on Economics and Management, Vol. 4, No.1, pp. 42-45.*

Horton, S 2000, 'The competency movement: its origins and impact public sector', *The International Journal of Public Sector Management, Vol. 13, No. 4, pp. 306-318.*

Huai-Zu Li 2004, Business Research Methodology, *Xi'an Jiaotong University Press, Xi An, China.*

Hui-Xia Rao 2013, 'Assessment of enterprises R&D staff competency based on the fuzzy comprehensive evaluation model', *Statistics and Decision, Vol. 16, No. 1, pp. 183-186.*

Jian Li 2014, 'Empirical research on foundation secretary general competency model', China Soft Science, Vol. 10, No. 2, pp. 82-86.

Jian-An Chen, Jin Jin & He Fa 2013, 'The frontier analysis and future prospects of entrepreneurial competence research', *Foreign Economics & Management, Vol. 9, No. 2, pp. 14-24.*

Jian-Feng Peng & Xiao-Juan Jin 2003, Staff quality model design. *China Renmin University Press, Peking.*

Jian-Feng Peng 2003, Introduction to human resource management, *Fudan University Press, Shanghai, China.*

Jian-Feng Peng, Jun Liu & Lu-Cheng Zhang 2005, Managers ability evaluation and development, *China Renmin University Press, Peking.*

Jian-Min Wang & Mu-Chun Yang 2012, 'Research on the historical general trends and evolution of competency', *the Revolution, Vol. 12, No. 1, pp. 138-144.*

Jian-Zhong Li 2013, 'Research of competency model building of engineering science and technology talents in resource-based enterprises in Inner Mongolia'*, Science and Technology Management Research, Vol. 5, No. 2, pp. 119-122.*

Jing-Wu Xiao, Feng Shi & Zhi-Wei Tian 2014, 'Building the comprehensive evaluation model of forestry talents based on competency', *The Exploration, Vol. 7, No. 3, pp. 187-190.*

Kai Zhang & Ying Xiao 2004, 'Innovation on competency analysis and human resources management', *Adult Higher Education Journal, Vol. 2, No. 2, pp. 12-15.*

Kan Shi, Jin-Cheng Wang & Chao-Ping Li 2002, 'Research and evaluation of competency characteristics of top management model', *Acta Psychological Sinica, Vol. 3, No. 1, pp. 193-199.*

Li-Feng Zhong & Kan Shi 2004, 'The competency characteristics model of family enterprise top managers', *Acta Psychological Sinica, Vol. 1, No. 2, pp. 110-115.*

Li-Feng Zhong & Kan Shi 2004, 'The new progress in the study of competence characteristics', *Nankai Business Review, Vol. 2, No. 2, pp. 4-8.*

Li-Jun He 2015, 'Research on structure and development strategy of youth science and technology leading talents competency', *Scientific and Technological Advancement and Strategies, Vol. 8, No. 1, pp. 145-149.*

Long Ye, Wen-Jie Zhang & Wen-Sheng Jiang 2003, 'Management competency research', *China Soft Science*, *Vol. 11, No. 2, pp. 45-78.*

MeClelland, DC 1973, 'Testing for competence rather than for intelligence', *American Psychologist, Vol. 28, No. 1, pp.1-42.*

Mei-Ying Zhang 2012, 'Overview on competency research', *Productivity Research, Vol. 12, No. 1, pp. 250-252.*

Meng Wang, Rui Tao & Jing-Peng Li 2013, 'Building and applying enterprise middle managers' competency model – took the Mobile company in Xinjiang as an example', *Science and Technology Management Research, Vol. 2, No. 1, pp. 102-108.*

Min-Gui Peng & Jian Zhang 2006, 'Research and evaluation of domestic competence characteristics', *Scientific Research Management, Vol. 6, No. 2, pp. 62-67.*

Ming-Zheng Xiao 2010, Standards and the development strategies of Party and government leadership talent quality, *People's Publishing House, Peking.*

Ming-Zheng Xiao 2011, 'Discusses on the problems about the current leading cadres selection system in China', *Philosophy and Social Science, Acta Scientiarum Naturalium Universitatis Pekinensis, Vol. 6, No. 1, pp. 92-99.*

Ming-Zheng Xiao 2011, Theory and method of personnel quality evaluation, *Peking University Press, Peking.*

Peng-Cheng Bi, You-Min Xi & Yi-Yi Wang 2003, 'Cross-cultural groupthink effect: the comparison of the United States, Japan and China', *The Forecast, Vol. 6, No. 1, pp.23-45.*

Prahalad, C. K. and Hamel, Gary, The Core Competence of the Corporation (1990). Harvard Business Review, Vol. 68, Issue 3, p. 79-91 1990.

Qing-Wei Tong & Shi Qiu 2001, *The individual quality structure theory, China Science and Technology Press, Peking.*

Shui-Bo Zhang, Fei Kang & Xiang-Fei Li 2013, 'assessment on the construction of the project manager competency based on the support of vector machine (SVM) for', *China Soft Science*, Vol. 11, No. 2, pp. 83-90.

Shu-Ming Zhao & Juan Du 2007, 'Evaluation theories of enterprise operators' competency, *Foreign Economics & Management, Vol. 1, No. 2, pp. 33-40.*

Shu-Ming Zhao & Juan Du 2007, 'Human resource management research based on the competency model', *Economic Management, Vol. 6, No. 1, pp. 16-22.*

Shu-Ming Zhao 2008, Research on managers' professional competency quality in China, *Peking University Press, Peking.*

Spencer, LM & Spencer SM 1993, 'Competence at Work: Models for Superior Performance', *New York: John Wiley & Sons Inc., Vol. 17, No. 2, pp. 18-24.*

Wei Li 2013, 'Competency model research on intellectual property managers in scientific research organizations', *Science and Technology Management Research*, *Vol. 12, No. 2, pp. 88-94.*

Wei Zhao, Fen-Fen Lin, Jie Peng, Xian-Hua Bao, Bao-Qiang Qu & Chen Bai 2012, 'The evaluation theory model construction of innovative talents of science and technology', *Science and Technology Management Research, Vol. 24, No. 2, pp. 131-135.*

Xiao-Lin Dong & Lian-Jie Ma 2013, 'Research on relationship between university administrative management personnel competency and job performance', *Research in Higher Education, Vol. 10, No. 1, pp. 22-27.*

Xin-Bu hu, Zhi-Ping Yuan, Hong Chen & Lin-Na Hou 2014, 'The empirical study of leader emotional competency model constructing: took departmental level cadres in Shanxi Province as an example', *China Soft Science, Vol. 6, No. 1, pp. 85-89.*

Yu-Gai Zhao, Ru-Zhong Zeng & Yu-Zhong Lu 2014, 'Talent evaluation research of competitive intelligence based on competency model', *Science and Technology Management Research*, Vol. 8, No. 2, pp. 139-143.

Yu-Jun Miao & Qiu-Sheng Sheng 2003, 'Research on strategy analysis and decision-making characteristics at all stages of enterprise life cycle and', *Science Technology and Principles, Vol. 3, No. 3, pp. 32-43.*

Zheng-Zhong Dai & Li-Bin An 2013, 'The application of competence theory in human resources management', *China Soft Science, Vol. 7, No. 1, pp. 115-117.*

Zhi-Gong He, Hui Li & Guang-Lin Chen 2005, Human Resource Managers' competency model, *China Machine Press, Peking.*

Zhi-Qiang Ma, Ti Zhang & Yong-Yuan Zhu 2013, 'Competency research of R & D personnel in manufacturing enterprises under the background of service transformation', *Scientific and Technological Advancement and Strategies, Vol. 22, No. 1, pp. 146-151.*