

THE RESEARCH ON CHARACTERISTICS OF E-COMMERCE ENTERPRISES' KNOWLEDGE WORKERS AND THEIR MOTIVATING FACTORS: A REVIEW AND COMPARISON STUDY

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Abstract

With the development of the Internet, e-commerce enterprises spring up like the mushrooms. To a large extent, it depends on the knowledge workers who possess the three knowledge management systems—IT technology, network management technology and industry. The current study surveyed major studies on the characteristics of and motivating factors for e-commerce enterprises' knowledge workers, both in the USA and in China. Comparisons were made between studies in the two countries, and new perspectives were offered on the motivating factors for knowledge workers. Future research directions were proposed.

Keywords

e-commerce enterprises, knowledge workers' characteristics, motivating factors

1. Introduction

As early as in the 1950s, Peter Drucker pointed out that “the most important contribution of management was to increase the productivity of laborers by fifty times. In the 21st century, however, the most important assets of organizations are knowledge workers, and their productivity. The most important thing management needs to do, therefore, is to improve the productivity of knowledge workers” (Drucker, P.F. 2006). On entering the second decade of the 21st century, the roles of knowledge workers are increasingly prominent. CCP, the ruling party of China, explicitly had “strengthening China through science and education and through developing Chinese talents” as its strategy. By the same token, *The Mid-to-long-term National Education Development Program (2010-2020)* of China further emphasized the development of Chinese intellectual talents. According to the 2013 Chinese electronic commerce industry analysis report, Chinese e-commerce service industry overall turnover of about 33 billion in

2012, a year-on-year growth of 83%, supporting about 1.2 trillion network retail trade, as well as 8.4 trillion e-commerce transactions.

The main body of e-commerce business in China are knowledge workers. In order to promote the development of e-commerce enterprise, understanding the different needs of knowledge workers, the incentive factors preference become an urgent problem to solve. This study will review the literature, both Chinese and abroad, on the characteristics of knowledge workers, and based on the review and comparison, identify the preferences of e-commerce enterprises' knowledge workers for motivating factors. This paper will answer the 3 questions as below: Who are knowledge workers? What are the typical characteristics of e-commerce enterprises' knowledge workers? What are e-commerce enterprises' knowledge workers incentive preferences?

2.The definition and characteristics of knowledge worker

2.1. Defining the knowledge worker from different views

"Knowledge worker" was first brought forth in *Landmarks of Tomorrow: A report on the New Post-Modern World* (Drucker.P.F. 1999,2006). Later, many western scholars like Kidd(1994), Vogt(1995), Dove(1999), David(1999), Itzhak(1999), John(1987), Patricia(2001) and Davenport(2000) conducted further studies about knowledge worker's performance, motivation, and other related issues. In China, "knowledge worker" is a borrowed word, but similar words such as "intellectuals" and "brainworkers" have been used for years. In relevant literature, the definitions of knowledge worker are so diverse. Therefore they need to be classified, analyzed, examined, and synthesized.

Definition based on the work content

This kind of definition is made from the way to complete the work, and work process. Drucker(1994)referred to an individual who works primarily with information or one who develops and uses knowledge in the workplace as the knowledge worker. Yang et al. (2002) emphasized on the properties of work content, and considered knowledge worker as the staff who engages in knowledge work. Based on this definition, Sun (1998) held an opinion that the staff that directly takes part in knowledge work and follows this work as a profession can be called knowledge worker. He emphasized on the profession, to distinguish from an amateur, who does not take up knowledge work as a career. From the e-commerce enterprises' view, the knowledge workers refer more to the ones who use information technology and network technology and specialize in the acquisition of knowledge(coding), knowledge production(retrieval), and knowledge transformation(communication), such as software development engineer and hardware maintenance engineer(Xu 2006). This view highlights the nature of work; but understanding of the work content is not complete and neither in sufficient depth. The meaning from this view is somewhat imbalanced.

Definition based on the work output

The work output could be understood as an outcome for the organization the worker is working for. This kind of definition is outcome-oriented. J.Davies et al. (2005) proposed that the knowledge worker is coming with the increment of knowledge capital and bringing high added value. Xu and Zhu (2009) believed the knowledge worker is similar to the occupational brainworker, who makes creative contribution, and brings a strong value-added growth of knowledge and monetary capital. The knowledge staff in e-commerce enterprise can bring for the enterprise of high and new technology and multiple values. From this view, one can easily distinguish two extremes of, say, scientists from porters; but there could be grey area between brainworkers and labors. These grey areas could not be explained accurately here(Xu and Zhu 2009).

Definition based on the individual characteristics

Researchers in this view summed up general characteristics of knowledge workers from specific cases. Accenture (2008) defined knowledge workers as the staff who complete tasks with intellectual input, creativity, authority, including the professional, the paraprofessional with depth skills, and the senior manager. This type of workers always work in fields such as R&D, engineering design, marketing and legal service in e-commerce enterprises. Cai (2006) considered that knowledge workers have high degree of human capital and pursue independence, creativity, personalization, and diverse work contents. They create value by using knowledge and information. They keep on learning and creating to adapt to the complex and dynamic changes. Zhou et al. (2006) believed that knowledge

workers accept systematic learning of theory and professional skills, and build up an effective knowledge structure. Knowledge workers can leverage modern sciences to achieve productivity — education was introduced in this definition. The definitions from this dimension have their advantages of being operational, that the dimension is commonly used in empirical researches. However there are two shortcomings: first, there exist dozens of characteristics for knowledge workers; second, different scholars emphasized on different characteristics. Therefore, it is difficult to reach a consensus of the definition.

We believe that the above schools of thoughts can be synthesized, and a definition of knowledge worker generally can be like the following: they are workers who produce high value-added products and services with knowledge and ability, and keep on updating their knowledge and improving their abilities to adapt to the complex tasks and diverse work environments.

2.2. A meta-analysis of e-commerce enterprises' knowledge workers' characteristics

The electronic commerce enterprise belongs to the network information service industry, so most of its employees are knowledge workers. Their characteristics have their own particularity. Existing numerous studies on knowledge worker's characteristics offer no conclusion of consent. In this study, we will summarize the characteristics by a meta-analysis. In statistics, meta-analysis refers to statistical methods for contrasting and combining results from different studies, in the hope of identifying patterns among study results, sources of disagreement among those results, or other interesting relationships that may come to light in the context of multiple studies (Greenland S 2008). First, we used China National Knowledge Infrastructure (CNKI) as the database to conduct the search, for which we chose the fields of economy and management the scope for literature. Second, conducted an advanced search using the subjects "knowledge worker & characteristic", with 2000-2013. Third, listed the search results on citation frequency and downloaded the 1st-100th articles. Forth, skimmed through the literature and use "original study on characteristics of knowledge worker, rather than citing others' work" as the criterion, also taking electronic commerce as the keywords, which cut down the number of articles to 70. We also studied in details the top-three ranked articles.

Using statistical analysis, we identified 35 characteristics for knowledge workers. Those characteristics appeared in more than 10 studies are presented in Table 1. It is these characteristics upon which we can explore the incentive factors of knowledge workers in e-commerce enterprises.

Knowledge workers are more Independent

Peng (2000) pointed out that knowledge workers' independence is characterized by the act of empowerment. Empowerment has risks, because choosing the wrong person for the job can jeopardize the performance of the company. Compared with other types of employees, knowledge workers enjoy the rights and power to be in control of their work. In addition, they are held fully responsible for their work. With the development and application of network, many e-commerce enterprises use a new model of decentralization team type called "Starfish team", which represents higher standards and requirements. Knowledge workers in e-commerce enterprises are not only members of starfish team, but also the leader of the team. Their characteristics of self-management and self-control make them be more adaptable to the development of e-commerce enterprises.

Table1. The characteristics of knowledge workers

Rank	Frequency(*)	Characteristics	Jiang et al.	Lin	Peng
1	45	Independence	√	√	√
2	39	High level of turnover	√	√	√
3	30	Creativity			
4	30	Being difficult to supervise the work processes		√	√
5	29	Realizing self-value	√	√	
6	26	Being difficult to measure the work results		√	√
7	23	Knowledge capital		√	√
8	15	Dimly bounds of leadership and being contemptuous of the authority		√	√

9	13	Being loyal to the occupations instead of employers	√		√
10	13	Individual characters		√	

(*) The number of articles containing the character

Knowledge workers tend to more loyal to the occupation with high level of turnover

The e-commerce enterprises are able to adapt to the changeful environment rapidly, their knowledge workers generally have a high turnover rate. Of knowledge economy, the knowledge employees are prominent in the most important knowledge, which is deeply ingrained in their mind. Because of this, they are much more powerful to select opportunities, far more than the traditional workers (Lin 2002; Zhang 2004). Actually, "turnover", "job hopping" has become the focus of the e-commerce industry. According to the statistics, a total of 10 major e-commerce business executives have quit in 2013, including Amazon, Jingdong, Vancl, dangdang.com and so on (such as Jingdong senior vice president Cheng Junyi, Vancl senior vice president Wang Chunhuan). The turnover rate of senior knowledge workers in e-commerce enterprises from 2004 to 2013 are presented in Figure 1.

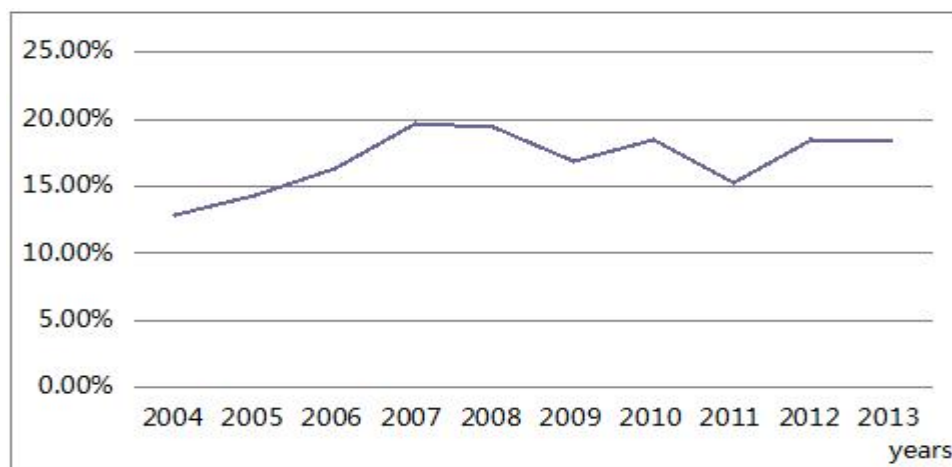


Figure1: The turnover rate of senior knowledge workers in e-commerce enterprises

Knowledge workers are creative

Creativity is the driving force for social progress and development, the survival of the e-commerce enterprise, and also the source of knowledge employees to create value. The knowledge staff's work is to obtain innovative results. As Drucker pointed out, persistent creation has become part of the knowledge staff's work, tasks and responsibilities. Compared with the traditional manufacturing industry and other industries, e-commerce enterprises pay more emphasis on innovation and learning ability, cultivate more focus on technology innovation and technological innovation of knowledge workers. Creativity is the source of the added value of e-commerce enterprises. Through their own originality, analysis, judgment and design, they bring high added value to the product or service (Gao 2005).

Knowledge workers pursue self-actualization

Knowledge workers have a strong will to realize their own goals; they strive for being recognized by professional peers through their own efforts (Cao 2002). From the analysis of costs and benefits, knowledge workers should pay cost of education and training during the process of acquiring knowledge and skills, and also opportunity cost of no income as well as costs of psychological struggles. Consequently they have expectations to achieve high earnings. This earning not only means wealth and social position, but also the compensation covering psychological costs (Sun 2004). Therefore, they prefer well-paid work with challenges. Mayun, the chairman of Alibaba once said: "to knowledge workers, it's easy to build their professional ability, but if no one cares about their spiritual growth, they may off one day."

Knowledge workers possess knowledge capital

The greatest wealth of knowledge workers is the knowledge which they have, there are two aspects mainly to be shown as blow:First, knowledge workers who are usually well educated , master certain professional knowledge and skills; and most of them have quite good personal qualities, such as the broad vision, strong thirst of knowledge and learning ability, broad knowledge level, etc. Organizations promote knowledge workers to turn their ideas, creativity, knowledge and experience into the source and motivation of the organizational development through the provision of resources and platform.Second, the knowledge workers possess knowledge characterized with the rapid development and change, so knowledge workers have been in the status of self-development and constantly knowledge updating in a long period, which is equivalent to continuously inject fresh blood for the development of organization. It determines the developing direction and trends of the company's future.

The knowledge workers of e-commerce enterprises create and accumulate explicit and tacit knowledge through practical work, mutual trust and shared enterprise culture atmosphere,the balanced scorecard as well as the performance indicators combine knowledge workers and performance together,using network technology to achieve knowledge sharing, knowledge storage and tacit knowledge explication”(Rong and Liao 2013).

3.The research status on knowledge workers incentive preferences in China

As e-commerce enterprises belong to the network information service industry, they need lots of knowledge workers in the field of information technology and network technology. The shortage of talents has become a serious problem in e-commerce enterprises. E-commerce enterprises need about 400000 knowledge workers every year in China, while the annual supply of e-commerce talent was only 40000(Liang and Jiang 2008). In this case, it is very important for enterprises to obtain and retain knowledge workers. Knowledge workers are becoming scarce resources. So how to motivate knowledge workers has become the key of human resource management of e-commerce enterprise at present.

In the same range of information search conducted for the study in the previous section, we conducted an advanced search with the subjects being “knowledge worker & motivation” or “knowledge worker & incentive”, with the time frame being 2000-2013. There were 256 articles published in academic journals on the subjects in that time frame. After eliminating the papers not directly relevant to the current research topic, 219 articles were selected as shown in table 2.There were few researches on knowledge workers' motivation in China before 2000. During 2004-2009, the number of relevant articles increased significantly, due to the rapid economic development of the period, and the large number of college graduates entering the workforce which caused the management's attention to the issue of managing knowledge workers (Li 2009).

Table 2. The quantity of articles published 2000-2013

Year	Article quantity	Percentage in the total
2001-2004	17	7.76
2005-2009	135	61.64
2010-2013	67	30.59
Summation	219	100%

4.The comparison of incentive preference of knowledge workers between China and The West

The development of the Internet in recent 10 years is very rapid which make a spurt of progress trend.It affects substantive changes in many industries,and brings great change to our life and work. Internet development ultimately depends on its talents, knowledge workers' incentive becomes more and more important.Research on electronic commerce abroad is earlier than us. As early as in 1961, USA scholar Stiegler put forward "information economics". As to the research on the incentive of knowledge workers in e-commerce enterprises,the West is also earlier than us. Chinese enterprises not only have foreign companies in common, but also have their personality. In this paper, by comparing the incentive preference of knowledge workers between China and the West, looking for ideas in reference, so as to better incentive for e-commerce business in china.

4.1. The common incentive preferences of knowledge workers

Researchers in western countries conducted a great deal of empirical research on factors with effective incentives for knowledge workers, which covers different professions such as college faculty, engineers, software designers in the USA, UK, Australia and Japan. The representative incentive preferences are shown in table 3 and 4, from overseas and Chinese researches respectively.

Table 3. The incentive factor of knowledge workers——Studies in other countries

Researcher	Time	1st	2nd	3rd	4th	5th
Tampoe	1989	Personal growth	Work Independence	Professional Achievement	Wealth	\
Andersen Consulting	1994	Compensation	Nature of job	Promotion	Peer relationship	Decision participation
Zingheim	2001	Attractive development prospect of the organization	Opportunity to grow	Good working environment	Total compensation	\

Table 4. The incentive factor of knowledge workers——Studies in China

Researcher	Time	1st	2nd	3rd	4th	5th
Peng et al.	2001	Compensation and bonus	Personal growth	Company prospect	Challenges	Job security and stability
State Council Development Research Center	2006	Opportunity to grow	Peer relationship	Sense of accomplishment	Fair evaluation	High pay
Wang	2008	Compensation & Benefits	Quality of leaders	Personal growth	Company growth	Safety and security

4.2 The comparison of incentive preferences of knowledge workers between China and the West

The difference in compensation and wealth

Chinese knowledge workers place more emphasis in compensation than their foreign counterparts. Yu et al. surveyed 454 samples in the US and 302 in China, and found that “higher compensation ranked number one in Chinese workers, yet was not even in top five among the US workers. The above phenomenon must be because of the economic backgrounds the Chinese workers were in. China is in economic transition period, and in relatively low economic development level. In addition, China’s economic environment is one that is complex and changeable, with high uncertainty (Ge et al. 2006). One must also note that in recent year, monetary reward is not only to satisfy workers’ fundamental needs, the amount of compensation is but also an important measure of the contribution a worker has made to his/her organization, and a measure of his/her social status (Min and Yan 2004;Yang 2004). Wang and Wang (2001) proposed an incentive system combining short-term incentive – skill-based salary – and long-term incentive – stock options. Other Chinese studies also found differences in state-owned companies and private companies, as well as regional differences (Chen 2004;Wang and Wang 2009;Wang 2008;Liu and Wang 2010).

The differences in work independence and job security

Knowledge workers in western countries ranked work independence as among top five factors. This could be closely related to the low uncertainty avoidance, low power distance, and high individualism western culture (Geert Hofstede 1993). Based on this cultural backgrounds, knowledge workers value liberty higher, prefer not to be interfered too much by superiors, and are more willing to undertake the consequence of their own decisions. In this situation, is has become urgent to find the balance point between teamwork and independence (Zhao and Wang 2006). As a contrast, Chinese Knowledge workers have high power distance, low individualism and tend to be risk-averse. Under such cultural backgrounds, Chinese knowledge workers have a great worship of authority, highly hero individualism as well as authoritarianism. They are prudential, industrious, endurance, risk-averse, ordered and can't stand uncertainty. They often inscribe their success and failure to ‘predestined relationship’. Although Chinese knowledge workers also enjoy certain flexibility in career change, because of traditional culture as well as economic

development level, jobs with higher security still have greater incentive. It does not mean, however, that Chinese workers do not need the kind of self-empowerment. Traditional 9-to-5 jobs and fixed work location would limit knowledge workers' creativity and idea generation, while flexible schedule can better break the boundaries of time and space to achieve optimal resource allocation (Wu and He 2007).

The difference in fairness

The factor fairness, although did not enter top five in most of the incentive studies, has been more emphasized by Chinese workers as compared to their international counterparts. The reason why it would be so is that China has its special *GuanXi* background, which emphasized maintaining emotional connections and mutuality of interests. In this situation, those workers without *GuanXi* would feel or face interference in the relationships between work input and output, between work output and rewards, between in rewards and work satisfaction. Knowledge workers would, likewise, not ignore this important aspect of work environment. Therefore, we should establish more fair evaluation systems to accurately measure the contribution of knowledge employees. This is the necessary support for internal and external fairness.

The difference in working environment

Compared with American knowledge workers, Chinese knowledge workers place more emphasis on working environment and culture environment. This is related to the cultural differences between China and the U.S. The Chinese traditional cultures pay more attention to the solidarity and cooperation, especially to the collectivism education. Employees are taught to treat the company as their home and carry forward the spirit of ownership, so the organization identity of Chinese knowledge workers is relatively higher. They have a strong collective consciousness and they pursue the personal values embodied in the collective. The American culture emphasizes on freedom and independence, so the Americans are more inclined to pursue personal fulfillment. There is no strong sense of the belonging to the company in which they work, so they pay more attention to personal development, and place less emphasis on their overall environment.

The difference in decision making participation

Chinese knowledge workers pay less attention to decision making than Americans. Maybe it is because of the difference on their power distances. Employee motivation also is closely related with power distance within a culture. The large power distance cultures emphasize hierarchy, obedience and authority, whereas the low power distance cultures emphasize equality, fairness and empowerment.

China is characterized by a high power distance culture. People think naturally that there are class differences between authorities and common people. Chinese people think they should follow the decision of their authorities and few of them challenge the thoughts or ideas of authorities. In companies, subordinates shouldn't disobey the boss, not to mention the decision making participation. Compared with Chinese culture, American culture has the low power distance. From the government to citizens, equality is emphasized to reduce the power distance among people. The characteristics of knowledge employees determine that most of them value equality and do not subdue authorities, they tend to participate in the decision.

4.3 Limitation of Incentive Preference Research, and Future Direction

The studies reviewed above cover many aspects of the issue of knowledge worker incentive preferences. However, most of incentive measures were produced through analyzing knowledge workers' demand and characteristics, other than their behavior motivation. There have been few that analyzes the incentive factors from the knowledge workers' behavioral dynamics. The situation is changing: literatures on workers' mental bargains are coming out gradually. The current studies on knowledge workers' incentive preferences have a lot of redundancy. The researches in China, especially conceptual studies, can be seen based on or adapted from researches of western countries. "Take the management sciences that originated in the western society, whose social psychology, culture, and behavioral norms are all very different, and introduce them into an environment with totally different psychology and culture, then the introduced management would totally likely be set idle or be distorted". We suggest here that future researches must consider the unique characters and the culture of China, through theoretical and empirical studies, to identify the incentive preferences for China's knowledge workers.

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