Research on Software Outsourcing and Its Talent Knowledge System

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Abstract: In recent years, with the vigorous development of the global service outsourcing market, China's service outsourcing industry has also grown rapidly. The state has made service outsourcing a strategic measure for economic development and has given strong support. Software outsourcing, as the main body of service outsourcing in China, is severely constrained by the talent bottleneck, and the research on software outsourcing talent knowledge system is obviously lagging behind. Therefore, carrying out corresponding research has become an urgent task for China's industry and academia, and it has important theoretical guiding value and practical significance.

1. Introduction

The development of international service outsourcing began in the 1980s and achieved rapid development in the mid-1990s. It still maintains a rapid development momentum. With the evolution of the division of labor and collaboration between the world economy and global society, the information industry has developed rapidly, and the global economy has shown a general trend of hardware-oriented development toward software and service-oriented development. As the core of the information technology industry and the strategic industry of the national economy, the software industry has developed rapidly on a global scale, setting off another wave of industrial transfer, becoming the main driving force and important innovation force to promote national economic growth, and with the global The software technology and products are constantly upgrading, and the software market demand is increasing. According to the statistics of the US Business Weekly, one-third of the global software production value is completed through outsourcing, and software outsourcing has become an important trend in the development of the global software industry.

2. Software outsourcing definition and process outsourcing

Literally translated as "external resources". "Outsourcing is an enterprise redesign around core competencies by selectively transferring some functions (and their usual management) to third-party vendors," the US Outsourcing Institute noted. Generally speaking, outsourcing refers to an organization that integrates non-core, low-value-added services to reduce costs, improve business efficiency, fully exploit its core competitiveness, and enhance the ability of enterprises to respond quickly to the external environment. External companies that optimize the allocation of resources on a global scale. Outsourcing is related to the survival and development of an enterprise. It is an important force to promote the structural transformation of enterprises.

Demand analysis. After establishing a cooperative intention with the user, the relevant system analysts will have a detailed understanding of the user, and analyze the customer needs, business models and business processes in depth. Then list the system's large functional modules and corresponding small modules and interfaces, and propose improvements to the customer to reconfirm the requirements.

Summary design. After determining the requirements, the system architecture design of the software system, such as the system's processing flow, organizational structure, functional modules, interface design, etc., and then work with the customer to develop a system implementation plan.

Detailed design. Detailed design of the specific work involved in different modules, such as its main algorithms, data structures, class hierarchies and call relationships. In the entire software

detailed design process, the software needs should be fully considered to coordinate the completion of the entire system function.

Develop coding. The programmer starts the specific coding work on the algorithm, data structure and hierarchical module according to the detailed design of the software system, thereby realizing the functions of each module. System testing and integration. After the coding of the different modules is completed, the system is tested by the programmer and the system is integrated. Then confirm the module function and system function with the customer.

3. Knowledge needs base sleeve research

Knowledge supply often lags behind knowledge demand, knowledge demand is the power of knowledge supply, and knowledge supply exists because of knowledge demand. According to different classification criteria, knowledge needs can be divided into different types:

Individual needs and group needs. People's demand for knowledge has commonality and individuality. It is the consistent pursuit of knowledge supply to satisfy individual needs, because individual needs vary widely and are ever-changing, and have the most individualized characteristics. The group demand refers to the knowledge needs of government organizations, institutions, companies and other organizations. The group needs have different knowledge needs among different groups on the basis of commonality. Professional needs and professional needs. There are certain correlations and differences in occupations and professions. Different occupations have different needs. For example, the needs of executives, teachers, doctors, administrators, and military personnel vary widely. Professional needs are generally closely related to the occupations of individuals, and it is the knowledge needs of a particular field of expertise.

Target needs and general needs. This is divided from the perspective of purpose. Individuals or organizations often meet the needs of their own goals, such as making decisions, providing ideas, learning skills, etc. while meeting the needs of growth knowledge, recreational activities, teaching reference, and scientific research. Non-core knowledge needs and core knowledge needs. Core knowledge refers to a theoretical knowledge system that has been proven to be reliable and correct, and is generally included in classical textbooks and authoritative reference books. Non-core knowledge refers to knowledge that needs further argumentation, such as academic papers, research reports, and controversial opinions. Core knowledge is generally prepared for the acquisition of other knowledge, while non-core knowledge is used to conduct research to achieve innovation.

4. Software outsourcing talent knowledge system construction

Demand determinism is a concept in the field of economics. It refers to the discovery of customer needs through market research, and thus the production of corresponding products to meet their needs. From the perspective of education, the concept, objectives, system and quality of the teaching process and evaluation of engineering education are determined by the needs of social development, the needs of industrial development and the future development needs of students. Among them, the demand of the industry plays a decisive role, and is the biggest stakeholder in demand determination. The development of engineering education should be oriented to the needs of industrial development.

At present, the talents trained in higher engineering education can not meet the needs of industrial development. Therefore, when constructing the knowledge system, this paper fully considers the needs and expectations of the industry for engineering graduates, and the characteristics of Japanese software outsourcing talents and the characteristics of US software outsourcing talents. In-depth analysis to build a software outsourcing talent knowledge system that meets the needs of industrial development.

Ausubel, a famous American cognitive psychologist, focuses on the study of learning theory. He advocates students to make meaningful learning. The psychological mechanism of meaning learning is assimilation. The core idea of assimilation theory is that the new information of students' learning is related to the original cognitive structure. The meaningful learning is through the content

of new learning and the existing cognitive structure of students. The interaction of related concepts leads to the assimilation of meaning. The cognitive structure mentioned here is the quantity, clarity and organization of the students' existing knowledge. To promote the generation of meaning learning, it is necessary to organize the teaching content in a reasonable way to meet the cognitive processing process of students. When organizing and organizing the learning content of students, Ausubel proposed two principles, the principle of gradual differentiation and the principle of integration and coordination. The principle of gradual differentiation is to first let students learn the "most general, the most comprehensive" content, and then gradually differentiate according to the specific details. The principle of integration and coordination is how to re-integrate the existing elements of the student's original cognitive structure.

The software outsourcing knowledge system describes the knowledge, skills and literacy of software outsourcing practitioners from four levels: knowledge space, knowledge field, knowledge unit and knowledge point. For the sake of convenience, this paper uses the inverted tree structure to represent the relationship between knowledge space and knowledge domain and knowledge unit. Knowledge space represents several subjects of software outsourcing from basic to professional to core. The knowledge system constructed in this paper consists of four basic modules: basic knowledge, software engineering and services, software applications and services, and industry knowledge, skills, and literacy. They are represented by capitalized abbreviations, and each knowledge module has several knowledge areas.

The field of knowledge represents a specific subject area within a module, represented by capitalized abbreviations, such as the computational base CMF, which consists of several units of knowledge. The knowledge unit represents independent subject units within a domain, and each knowledge unit can be divided into many knowledge points.

Basics SFK stands for Software Outsourcing Fundamental Knowledge, which defines the basics of the software services outsourcing industry as an introductory course in CDIO. It not only provides students with some basic knowledge and abilities, but also allows them to quickly understand the role of an engineer and stimulate interest in learning. The software outsourcing discipline is a fusion of theories and methods of related disciplines such as mathematics, economics, management, and engineering. Therefore, the basic knowledge (SFK) mainly includes the computational foundation (CMF, Conputer Foundation), the engineering foundation (ENF, Engineering Foundation), the mathematical foundation (MAF, Math Foundation), and the service foundation (SEF, Service Foundation). SFK refers to the calculation basis, mathematics and engineering foundation of "Computer Science and Technology (Software Engineering) Professional Specification", and on the basis of it, it adds the service nature unique to software outsourcing, that is, the basic knowledge of engineering that joins the basic knowledge field of service and service. unit.

Software Engineering and Services SES stands for Software Outsourcing Engineering Service, which defines the basics of software engineering that software outsourcing talent should have, corresponding to the disciplines in the CDIO-Physical Course. Because software outsourcing is based on software engineering, software engineering is the method and tool knowledge of software outsourcing personnel serving other fields. Therefore, the software engineering and services of the module's various knowledge areas conform to the development of software processes, and maintain a certain consistency with the software knowledge system SEEK knowledge system. The difference is that the module has joined the cross-integration of software engineering and service science. Software Engineering and Services (SES) includes Software Modeling and Analysis (MAA), Software Design (DES, Design), Software Evolution and Process (EAP) and Software Quality (QUA, Quality).

The software outsourcing industry is supported by software technology. Based on the engineering and methodology of software development, it provides scalable solutions for all areas of the world to create value for customers. Therefore, the software outsourcing industry needs a multi-functional and multi-functional talent. With the continuous expansion of the software application field, in addition to a solid professional basic knowledge, software outsourcing talents

should be familiar with the basic knowledge of engineering in related fields to meet the needs of service economy. In the process of software development, there is no "business" as a prerequisite for development, and software development loses its meaning. The evolution of the topic content of the China University Student Service Outsourcing Innovation Application Contest fully illustrates this point.

Occupational Quality SOQ stands for Occupational Quality of the Software Outsourcing. The space module mainly includes professional jude, international vision, market and service awareness, and innovation and entrepreneurship awareness. Professional literacy is cultivated in the learning and practice of various knowledge modules. SQE (Professional Ethics in Software Outsourcing) mainly includes responsibility, initiative, willpower and so on. The International Perspective in Software Outsourcing (SIP) covers the similarities and differences between countries in politics, economy, society, culture, science and technology; the international market competition mechanism, the law of economic development; the interaction between engineering and society. Market and Service Awareness (MSA) refers to customer satisfaction with systems and products.

5. Conclusion

Oriented by industrial development and social needs is the goal of talent cultivation. On the one hand, the construction of talent training mode and system should be based on the professional education knowledge system, which is the basis of talent cultivation; on the other hand, it is necessary to innovate the mode and means of training so that talent training can meet actual needs. School-enterprise cooperation and joint participation in talent cultivation is conducive to the common development of schools and enterprises, and is the basis for the construction of software engineering talent training model; industrialization background and industrial development demand for talents is the basis for the construction of software engineering talent training model; multidisciplinary The integration of domain-based software engineering talents is the support for the construction of software engineering talent training mode; the international vision is the direction of software engineering talent training mode construction.

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