

Analysis of the Interactive Relationship between Virtual Operation and Knowledge Distribution Based on the “Knowledge Value Curve”

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Abstract

Virtual operation makes the knowledge of enterprise to be distributed from generalization to high-value and professionalization, and the intersection of knowledge distribution among enterprises will be reduced, and the complementarity of knowledge will be stronger and stronger, which will further promote the development of the virtual operation for enterprises. The gap of knowledge distribution based on uneven talent distribution makes the geological separation of virtual operation become very necessary, but the virtual operation will promote the further asymmetry of knowledge distribution. So, the knowledge which distributed according to professionalization and according to values in space has the relationship of interactive improvement and interactive integration with the virtual operation.

Keywords: Virtual operation, Knowledge value, Knowledge value curve, Knowledge distribution

1. Connotation and characteristics of virtual operation

In 1991, the famous scholar of US, Roger Nagal, first put forward the concept of virtual operation. The virtual operation means the integrated operation that depending on the core ability or the advantageous ability, to obtain the function which is not contained in the resource of the enterprise to fulfill customers' dynamic demands, the enterprise uses the virtual technology and the information technology to selectively cooperate with relative enterprises by the non-property right forms such as outsourcing and alliance, and combines exterior operation resources with the operation resources of the enterprise among difference spaces. The virtual operation could visualize the organization frame of the enterprise, the products of the enterprise, the technical talents of the enterprise, so the enterprise could fully share the division, cooperation, and high professionalization, and change the state of “big and all-embracing” and “small and all embracing”. Virtual operation makes the enterprise to break through original material boundary, and extend and enlarge the function interface of the enterprise by virtue of exterior non-property right resource, and the enterprise could implement the virtual operation by the forms such as outsourcing, intergrowth, strategic alliance, virtual distribution, and smart making to realize the implementation and extension of the production function, the sales function, the management function, and the R&D function of the enterprise.

2. Knowledge value curve and virtual operation

2.1 Knowledge value curve

In the beginning of 1990s, the president of Taiwan Acer Group, Mr. Shi Zhenrong put forward the concept of “Smiling Curve” which opened out one phenomenon, i.e. in the side of the parabola (the upper position of the value chain), with the R&D investment of new technologies such as display, EMS memory, CPU, and suited software, the added-value of the product gradually ascends, and in the right side of the parabola (the lower position of the value chain), with the establishment of the brand operation and the sales channel, the added-value will gradually ascend, and in the middle stage of making and assembly with the labor-intensive characteristic, not only the technical content is lower and the profit space is narrow, but the market competition is very drastic, and it is easy to be substituted by the craft brothers with lower costs, so it is the part with the lowest profit in the whole value chain. Because the curve likes a smiling mouth, it is called as the “smiling curve”. The smiling curve could indicate the added values created by various parts of the value chain, so it is also called as the “added value curve”. In fact, various parts and activities in the back of the value chain are all supported by different kinds of knowledge, and they are just the outputs represented by the knowledge investment, so the difference of the added value created by various activities on the smiling curve is the difference of various knowledge added values in essential. Therefore, as seen in Figure 2, on the “knowledge value smiling curve”, the

horizontal axis denotes the knowledge required by various parts and activities in the value chain, and the vertical axis presents the added values what they created.

The knowledge value smiling curve could reflect the value created by the knowledge in various parts of the value chain, and it is the deep understanding of the added value curve, and the added value created by various kinds of knowledge on the value chain is decided by the characteristics of the knowledge.

The knowledge with high added-value means the knowledge about R&D, design, and brand operation, and these kinds of knowledge generally possess the uniqueness, the uncertainty and accumulation of investment and output, the dependence of human, and the income monopolization formed based on above characteristics. Comparing with that, many kinds of low added-value knowledge about making, assembly, logistics, and distribution, which are called as the low-value knowledge, have the characteristics such as the relative certainty of investment and output, the dependence of equipment and labor force, and the easily simulated and copied characteristic based on above characteristics. Comparing with R&D, design, and brand construction, the linear, structured, and flowing explicit knowledge in many stages is more utilized to solve problems, so the investment and output are easily confirmed, for example, the estimation of the investment and output in the manufacturing, personnel, machines, and equipments could be predicted easily. At the same time, the knowledge required by the low-added activities is more represented by the machines and equipments or simple personnel operation flow, and the dependence on the equipments and the labor force.

2.2 Knowledge value curve and virtual operation

To explain the growth and the virtual operation process of common enterprises by the knowledge value smiling curve, the operation of the enterprise is supposed that it integrates R&D, manufacturing, distribution, and brand operation. In the knowledge value curve of the enterprise at the beginning of the operation, because of large investment in the R&D design and brand operation and small scale of enterprise market, its investment in R&D, design, and brand operation has not obtained sufficient added value, so its knowledge value curve is a forced smiling curve seen in Figure 3. Here, the proportions of many low added value stages such as manufacturing, assembly, logistics, and distribution in the total value of the value chain are lower and lower. When the enterprise reviews its knowledge value, it could eliminated low value-added interior enterprise knowledge and centralized the energy of knowledge management on the core knowledge of the enterprise by the integrated allocation with exterior knowledge, which spirit is to centralize limited resources on the high added-value knowledge and virtualize low added-value knowledge, and the enterprise should must be able to refrain itself in some matters in order to accomplish others.. For the outsourcing which should not be done by the enterprise, it is advantaged for those contracted enterprises, because low added value activities are easy to form the scale economy, and the function of the experience/learning curve will largely enhance the knowledge added values in this part and acquire new knowledge. Therefore, virtual operation is the optimized integration of the interior knowledge and the exterior knowledge, and it always is the win-win integration.

The development of internet and information technology makes the new economic mode out of the limitation of time and space, and the trading charge out of the influence of time and space, which could provide the feasibility for the complementary and optimized integration of the interior knowledge and the exterior knowledge, so the virtual operation arouses with the development of the network economy.

3. Relationship between the virtual operation and the enterprise knowledge distribution

3.1 Interactive relationship between the virtual operation and the enterprise knowledge distribution professionalization

By the virtual operation, the “all-embracing” enterprise becomes the “core” enterprise with a few functional departments, and the “big and all-embracing” and “small and all-embracing” state of the enterprise could be changed. Virtual operation could not only rebuild the value chain and divide the work of the value chain activity, but also change the distribution of knowledge.

As viewed from the knowledge distribution in the organization of enterprise, most traditional enterprises integrated R&D, design, manufacturing, and marketing. But single enterprise could not possess top-ranking technology and service level in various domains such as R&D, design, manufacturing, and marketing, and is impossible to obtain the lowest cost in various stages such as R&D and production of the product. One of the approaches to obtain the maximum profit for the enterprise is to realize the separation of brain and body, and rebuild the value chain of the enterprise, and realize the optimal allocation of key resources. So the operation mode of “brain-body separation” occurs in the interior value chain of the enterprise, i.e. keeping the high added value parts, and eliminating disadvantageous and low added-value parts, and on the surface, it is the separation

and rebuilding of the value chain activity, but its essential is a kind of work-division and rebuilding of knowledge management, and its result is that the knowledge possessed by the enterprise is more and more professional and nuclear. Virtual operation makes the knowledge of the enterprise become more and more professional, and the intersection among the knowledge distributions of the enterprise will be reduced, and the knowledge complementarity among enterprises are stronger and stronger, and the competition among enterprise is decided by the common knowledge, and the essential of the competition becomes the competition of the knowledge management ability among enterprises.

The professionalization of enterprise knowledge distribution and the complementarity of enterprise knowledge will create condition of the virtual operation of the enterprise. In the background of the professionalization and complementarity of knowledge distribution, the enterprise begins to have the condition to give its non-nuclear businesses to the virtual allied enterprises. This cooperation management based on the trust and contract makes the core enterprises could get ride of “big and all-embracing” and complex enterprise management system, so the enterprise could more effectively centralize the limited resource and ability of its own development of core ability, and for allied enterprises, they will certainly produce the scale economy and experience curve and obtain the competition advantage because of the allied cooperation.

3.2 Interactive relationship between the virtual operation and the knowledge spatial distribution

As viewed from the spatial distribution, the original uneven knowledge distribution induced by the uneven talent distribution (the talent distribution has higher positive pertinence with the comprehensive competition of the city) makes the knowledge distribution to have certain spatial difference. The utilization and existence of knowledge, especially for high-value knowledge, will finally depend on the human being, so the virtual operation is certainly presented by many high added-value activities such as R&D, design and brand, which are separated with the geological space of may low added value activities such as manufacturing and assembly. That will objectively promote the separation of high added-value knowledge and low added-value knowledge in the geological space, and make the high added value knowledge more distributed in the countries, regions, and cities with higher competitive force, for example, the headquarter, the R&D center, the marketing center, or the brand operation center are generally centralized in the cities with higher competitive force, and when the enterprise develops to certain stage, it will move its headquarter, R&D center, marketing center or brand operation center to the developed city for the talent utilization. So with the geological distribution of activities, the knowledge is distributed in space. Virtual operation makes the high added value knowledge more and more centralized in developed cities, and the total knowledge values have more and more gaps among regions, and the total knowledge value gap will induce the economic development gap among different regions. As viewed from the knowledge management, the gap of total knowledge value is one important causes of the economic development gap among countries, developed regions and undeveloped regions, city and city, city and village. The geological spatial distribution gap of the knowledge sorts and values will promote the continual development of the successive virtual operation. So the mutual promotion and integrated interaction will exist between the geological distribution of knowledge and the virtual operation. The distribution and flow of knowledge could be changed by the government or enterprise polices, for example, through many preferential polices such as attracting investment and introducing talents, the government could change the geological distribution of enterprise and talent and change the geological and spatial distribution of knowledge.

4. Conclusions

Virtual operation makes the knowledge possessed by enterprises to develop from comprehensive distribution to professional distribution, and the interior knowledge of enterprise exists in knowledge employees' brain by the form of explicit knowledge. The intersection of knowledge distribution among enterprises will be reduced, and the knowledge complementarity among enterprises will be stronger and stronger, which will further promote the further development of enterprise virtual operation. The knowledge distribution gap based on uneven talent distribution makes the geological separation of virtual operation become necessary, and the virtual operation will further promote the further inequity of knowledge distribution, and the knowledge with high added values will more centralize in those developed countries, regions, or cities, and the gap of the total knowledge value among different countries, regions, or cities would further extend, and this gap will certainly promote successive virtual operation to make the high added value to be distributed in the countries, regions, and cities with advantages. So the mutual promotion and integrated interaction will exist between the geological distribution of knowledge according to the professionalization distribution and the geological distribution formed by the values and the virtual operation.

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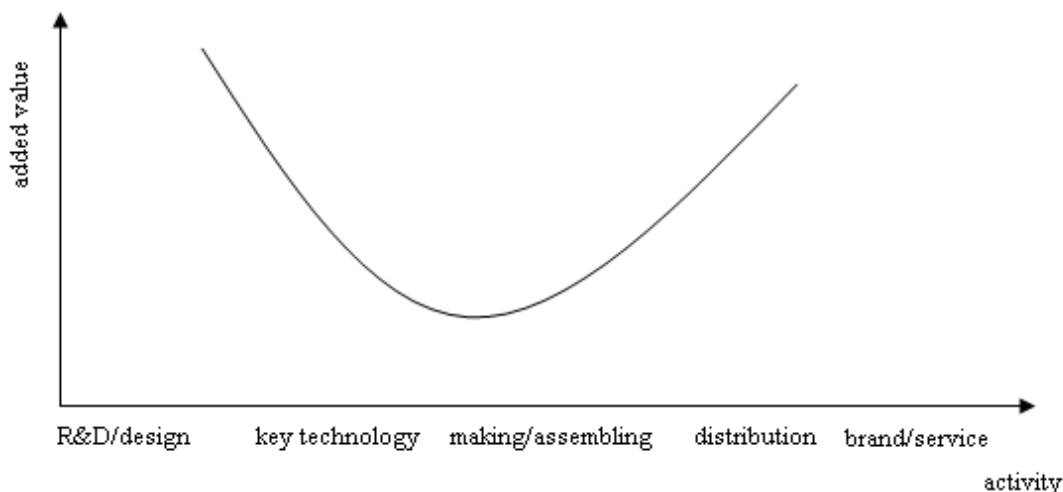


Figure 1. Smiling Curve

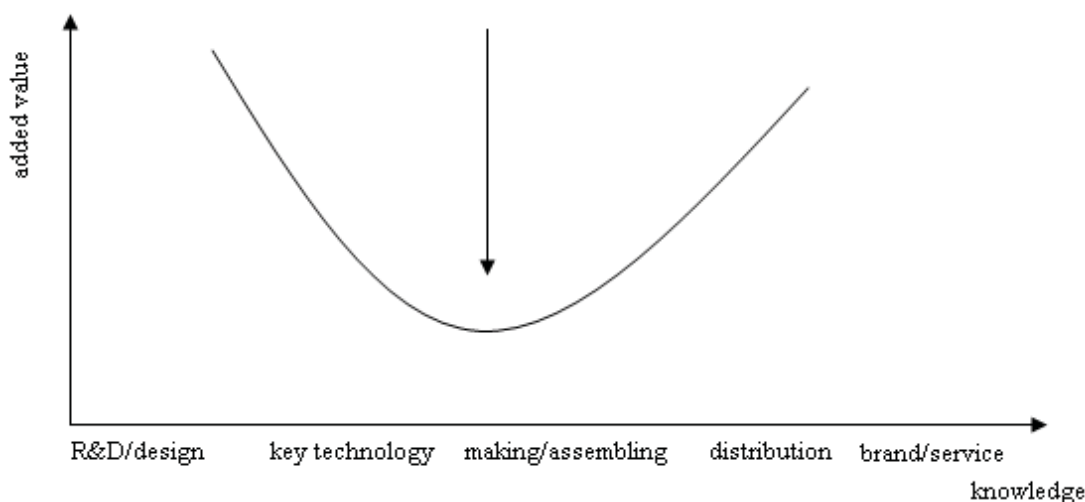


Figure 2. Knowledge Value Smiling Curve

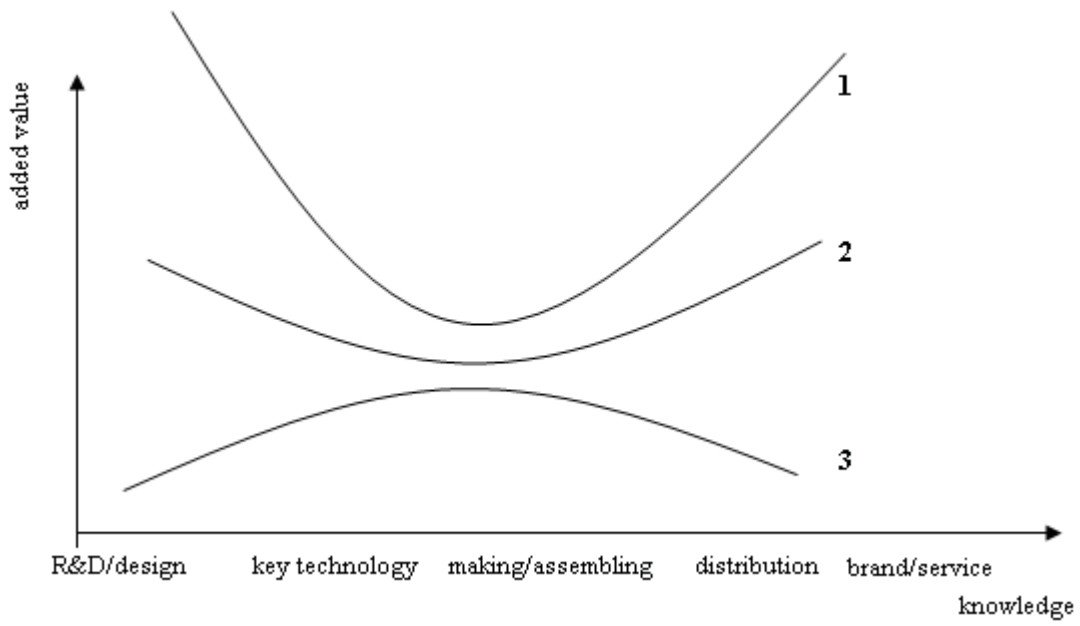


Figure 3. The Growth and Virtual Operation of General Enterprises Based on the Knowledge Value Smiling Curve