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Knowledge Transferring Path based on Knowledge Link ——the Knowledge Transfer of Scientific and Technological Achievements as an Example

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ABSTRACT

Scientific and technological achievements which are used in the life become more and more prominent, and gradually change the people live way. In order to meet the needs of society, it is important do scientific achievements better, knowledge transfer should be the focus of the current knowledge management. This paper first clarifies the related concepts of knowledge chain, knowledge transfer, key path, and then shows the basic connotation of knowledge transfer of scientific and technological achievements, analyzes how scientific and technological achievements are transformed, and finally establishes the knowledge transfer path model of scientific and technological achievements. This paper validates the superiority of the model to solve the real problem, and provides the theoretical basis for the determination of the scientific and technological achievements into the key path of the real product, and has certain practical significance.

1. INTRODUCTION

Research shows that the "knowledge chain" is an interactive process, there are four stages. Win J. Nijhof is a well-known educator, he believes that the knowledge chain is the knowledge to the further deepening of intelligence, in this process we need to discover knowledge, dissemination of knowledge, apply knowledge. However, Wiig M. emphasizes that the knowledge chain contains the process of knowledge origin, creation, transfer and change, absorption and utilization. So we can easily find that the knowledge chain is a process of learning, including knowledge acquisition, absorption and use, and the knowledge chain is different from the traditional organization management, it can make an appropriate response to changes in the external environment. The knowledge chain is also linked to organizational knowledge and core competencies. In short, the knowledge chain for knowledge activities is a very orderly process, a business in order to have the core competitiveness, knowledge chain management is indispensable.

The domestic research knowledge chain is relatively late. But from a variety of literature, we can get the development trend of knowledge chain. Chen Zhixiang and others believe that the management of knowledge by the knowledge-based enterprises are widely valued, this emphasis on the knowledge system is well used. In this process, the knowledge chain links the various parts. Stress money province three pointed out that the knowledge chain is to disorderly orderly process. Liu Ji-sheng, etc., that the enterprise of knowledge transformation and innovation, thus forming an infinite loop process.

2. RESEARCH ON KNOWLEDGE TRANSFER PATH BASED ON THE KNOWLEDGE CHAIN OF SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENTS

Usually we show that a project is to use a directed graph. In the figure, the event is represented by a vertex, and the activity is represented by a directed edge. The duration of the activity is expressed by the weight of the directed edge. The map is called the activity with the edge of the network, also known as AOE network. In this paper, the establishment of the knowledge transfer path model of scientific and technological achievements is realized in the AOE network. Using the critical path analysis method, the weight of the AOE network is calculated and the weight and the maximum path are obtained, which is the path of knowledge transfer of scientific and technological achievements.

In order to conveniently describe the model algorithm, the following notation and markings are specified.

1. The longest length from the source point V0 to the path of Vi it points to is now represented by each component Z [i] of the vector Z.
2. X [i] indicates whether the distance between V0 and Vi has been obtained, if not X [i] = 0, otherwise X [i] = 1.
3. A is the adjacency matrix of G.
4. According to this model to a certain degree of correction to get Q, the key path of all the information are included in the Q. All the key path from the source point to the sink point is through it.
5. R (u) represents the set of the front nodes of u.

The specific algorithm for the knowledge transfer path model of scientific and technological achievements is as follows:
Let V = {V0, V1, ... Vm} Then find the algorithm for the critical path of the knowledge source V0 to the result product Vn-1: G = <V, E, W>, V = {V0, V1, ... Vm}

1. Initialize matrices X, Z and Q: Let X [i] = 0, X [0] = 1, Z [i] = A [0] [i] (0≤i <n) and Q =
2. k is selected such that Z [k] = max {Z [i] | X [i] = 0} and X [k] = 1. Q [k] [i] = Q [k] [i] + Z [k] is the value of the k + 1th row of the matrix Q, that is, if Q [k] [i] is not equal to 0,], Otherwise the value of Q [k] [i] does not change, i = 0,1, ..., n-1.
3. The value of Z is corrected according to the value of the k + 1th row of the matrix Q, that is, if Z [i] <Q [k] [i], Z [i] = Q [k] [i] I = 0, otherwise the value of Z [i] does not change, i = 0,1, ..., n-1.
4. to determine whether the end of the process or not, if the end of the jump to (5), or jump to (2).

5. get the critical path according to the matrix Q. We use the following formula to find the set of the front nodes of each vertex: R (u) = {w | Q [w] [u] = Z [u] and u ≠ w}, and then based on the result , Get the key path from the source of knowledge to the product.

It is worth noting that O (n2) is the time complexity of this algorithm, but all the key paths from the source point to the sink point can be calculated by this algorithm.

Known a university has a scientific and technological achievements to be transformed into physical products, through the government plan and technology market in two ways to spread out scientific and technological achievements from the school, and then communicate with the relevant technical experts to form a scientific and technological achievements of the production line, and ultimately through the above Knowledge transfer, physical products from scientific and technological achievements from the transformation. Figure 4-1 shows the knowledge transfer path, as shown in Figure 4-1, where V0 represents the scientific and technological achievements, V1 represents the technology market A, V2 represents the policy plan, V3 represents the technology market B, V4 indicates the enterprise expert J, V5 indicates the enterprise expert M, V6 represents the production line 1, V7 production line 2, V8 represents the actual product; weighted directed graph weight wij said knowledge transfer reliability (0 ≤ wij ≤ 10), the greater the reliability from V0 to V8, scientific and technological achievements The more reliable the path to the transformation. Request the key path of the transfer of scientific and technological achievements in colleges and universities.

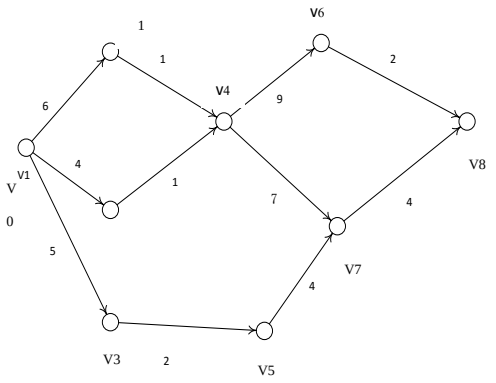

Figure 1. a university science and technology results transfer weighted map

Solution: Q, Z and X changes as follows

1. Initialize Q, Z and X:

	V0	V1	V2	V3	V4	V5	V6	V7	V8
V0	0	6	4	5	0	0	0	0	0
V1	0	0	0	0	1	0	0	0	0
V2	0	0	0	0	1	0	0	0	0
V3	0	0	0	0	0	2	0	0	0
V4	0	0	0	0	0	0	9	7	0
V5	0	0	0	0	0	0	0	4	0
V6	0	0	0	0	0	0	0	0	2
V7	0	0	0	0	0	0	0	0	4
V8	0	0	0	0	0	0	0	0	0
Z[i]	0	6	4	5	0	0	0	0	0
X[i]	1	0	0	0	0	0	0	0	0

Z [1] = max {Z [i] | X [i] = 0} = 6, X [1] = 1. Z [4] = max {Z [i] | X [i] = 0} = 7, X [4] = 1, and Z [1] is used to correct the value of the second row and the second row Z [6] = max {Z [i] | X [i] = 0} = 16, X [6] = 1. Z [6] = x {i] = 16, X [6] = 1. Z [8] = max {Z [i] | X [i] = 0} = 18, X [8] = 1. Z [7] = max {Z [i] | X [i] = 0} = 14, X [7] = Z [8] 1. Z [3] = max {Z [i] | X [i] = 0} = 5, and Z [3] is used to correct the value of Z in the row 8 of the matrix Q with Z [7] , X [3] = 1. Z [5] = max {Z [i] | X [i] = 0} = 7 (1) The value of Z is corrected by Z [3] and the value of Z is corrected according to the value of row 4 of matrix Q; , X [5] = 1. Z [2] = max {Z [i] | X [i] = 0} = 4, X [2] is the value of row 6, and the value of line 6 is corrected by Z [5]] = 1. Z, Z and the formula R (u) = {w | Q [w] [u] = Z [u] = Z [w] [u] = Z [2] The value of the third row is corrected by Z [2] U] and u ≠ w}, we find the set of successor nodes of each vertex:

R（V8）={V6，V7}　　R（V7）={V4}

R（V6）={V4}　　R（V5）={V3}

R（V4）={V1}　　R（V3）={V0}

R（V2）={V0}　　R（V1）={V0}

R（V0）= ∅

All key paths for source V0 to sink V8 are: V0, V1, V4, V6, V8 and V0, V1, V4, V7, V8, and the length is 18.

Therefore, the key path of knowledge transfer of scientific and technological achievements in colleges and universities is V0 → V1 → V4 → V6 → V8 and V0→V1 → V4 → V7 → V8. Technology Achievements → Technology Market A → Enterprise Expert J → Production Line 1 → Actual Products and Scientific Achievements → Technology Market A → Enterprise Expert J → Production Line 2 → Actual Product.

3. SUMMARY AND PROSPECT

This paper starts from the knowledge chain and knowledge transfer theory, analyzes in detail how the scientific and technological achievements are transformed, and studies the spiral model of knowledge transfer and the key path method, and lists the corresponding examples. Through the key path algorithm to explore the reliability of the transformation of scientific and technological achievements, which path is the most reliable, the real knowledge applied to practice, the scientific research into products can be profitable, therefore, the study of knowledge transfer for the practical application of a very Far - reaching significance.

China is in a developing country, is also a critical stage of transformation, all aspects of equipment are not perfect, coupled with the existing enterprises in our country there are different levels of quality differences, so the level of development of enterprises will be uneven , Resulting in this method has not been a large area of popularity. The reason for this phenomenon is two aspects: the first external environment is mainly caused by the government more interference, the transformation of scientific and technological achievements of a series of complex and changeable process. The second by the industry's own quality constraints, such as some companies are both managers and technical staff, they often focus only on technical research, a lot of work is to rely on experience to complete, which makes the management of arbitrariness, It is difficult to implement in accordance with the plan. Therefore, enterprises should improve their own technical application level, cultivate their own core competitiveness. In addition, the Chinese government should formulate the management policy of scientific and technological achievements transformation as soon as possible, with the power of the government to get a large area of technology, so that the process of knowledge transfer of scientific and technological achievements in China has a qualitative improvement in order to better benefit the community.

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