

# Strategies for Management of Technology in Knowledge Economy

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**Abstract** The paper, based on the demand for Management of Technology ( MOT ) in knowledge economy, and the origin and status quo of world MOT, analyzes the philosophy of MOT and its connotation, studies the definition and qualities of MOT talents, and the strategies for cultivating them, and explores the implementation measures and scenarios for MOT strategy.

**Key words** knowledge economy, management of technology, value of technological assets, technical capability

## 1 Introduction

The economy in 21st century is knowledge-oriented economy in the setting of world economic integration. With knowledge as the capital, the knowledge economy is a new economic form taking shape after the agricultural and industrial economies. The emergence of the knowledge economy has exerted much influence on all the fields of the economic activities, the ways of existing production, living and thinking. As a most important component of the production elements, the knowledge economy is a sustainable economy because it has the hi-tech as the first industry and the intellectual resources as the basis. The emergence of the knowledge economy marks the coming of the new economy era which is based on the intellectual resources and in which knowledge will become the most important economic elements to replace the industrial economy. “Science and technology is the first productive force” has set the benchmark for the development of knowledge economy in our country, and the implementation of the strategy of developing the country by relying on science and education is the ever lasting powerhouse to promote the development of the country. Now about 20 countries in the world are the innovation-oriented countries such as the U.S.A., Japan, South Korea, Finland, whose advanced in science and technology contribute more than 70% to the GDP and whose reliance on outside technologies is less than 30%. Their economy is the integrated economy and ours is the loose one. In our country the contribution of the science and technology to GDP is less than 40%, and the development is relying on the input of the labor force and capital.

Innovation in science and technology is the engine of the economic and social development of human society. The emergence of the knowledge economy makes knowledge the basis of the social and economic development. With knowledge as the most important resources and the basis, the strength of science and technology has become the most important competitiveness. In the new century a national innovation system should be established, and the innovation awareness and the innovation capability should be enhanced through building up a good environment, and the innovation in knowledge, technology, and system so as to promote the economic development of our country. The knowledge economy is one with intangible assets as the main investment, and so knowledge, intelligence and intangible assets will play a decisive role in the economy. The knowledge economy is the knowledge based decision-oriented economy, and is the economy in the setting of the world economic integration. The world market has been one of the main elements which drive the knowledge economy to grow continuously.

With modern science and technology as the core, the knowledge economy represents the economic development direction. We should establish the new system for science and technology, which is suitable for the socialist market economy and the natural development laws of science and technology. We should enhance the contribution of science and technology to the economic growth. We should shift the economic construction and social development elements to reliance on progress in science and technology and on enhancing the quality of the labor force. We should enhance the contribution of science and technology to the economic growth through progress in science and technology and innovation in system for science and technology. We should change the resources based economic growth to efficiency based growth, change the existing operation into integrated operation and the

economic growth model from the quantity expansion to quality enhancement. We should improve the basically established new system for science and technology development, speed up the process of improving labor efficiency based on progress in science and technology and realize the combination of science and technology and economy. Now the process of industrialization of the research achievements in science and technology has been speeded up. To meet the challenges of the knowledge economy, many high quality talents with the ability of innovation in knowledge are needed. So we need to cultivate Management of Technology talents who can do well in the knowledge economy and establish the MOT mechanism with the Chinese characteristics.

## 2 The Philosophy and the Connotation of MOT

Management of Technology (MOT) is the commercialization and innovation in advanced technology, and is the management approach developed from the idea of regarding “technology” as commodity. Specifically, MOT is to discover, develop and widely use the unique technology and potential through continuously restructuring and innovating the existing technology and knowledge with new technology and knowledge system and through objective survey and analysis. MOT is defined by Japanese Industrial Department as “the operation and management activities by enterprises and organizations that rely on technology, which continuously create value of technology and economy under the conditions of developing as much as possible and mastering technology for the purpose of sustainable economic development.” In this connection, MOT can be comprehended from the angle of effective utilization of technology and enterprise management. In one word, MOT is managing technology, that is to say, it is the creative management of new products and new undertakings based on the development of technology. It means the process of the scientific management which begins at the research, development and design of commodity and ends with the sales of products and technology and making profits.

Advanced technology is the growth point and core of the modern economy. The invention and creation of new technology is closely related to the operation and management of technological achievements. For example, the philosophy of MOT embodies in the new undertakings created by the combination of the enterprise own management resources and the outside resources such as human power, materials and information in the fields of possible value adding based on the new products and intellectual property rights such as franchise, patents and other added values from the scientific achievements.

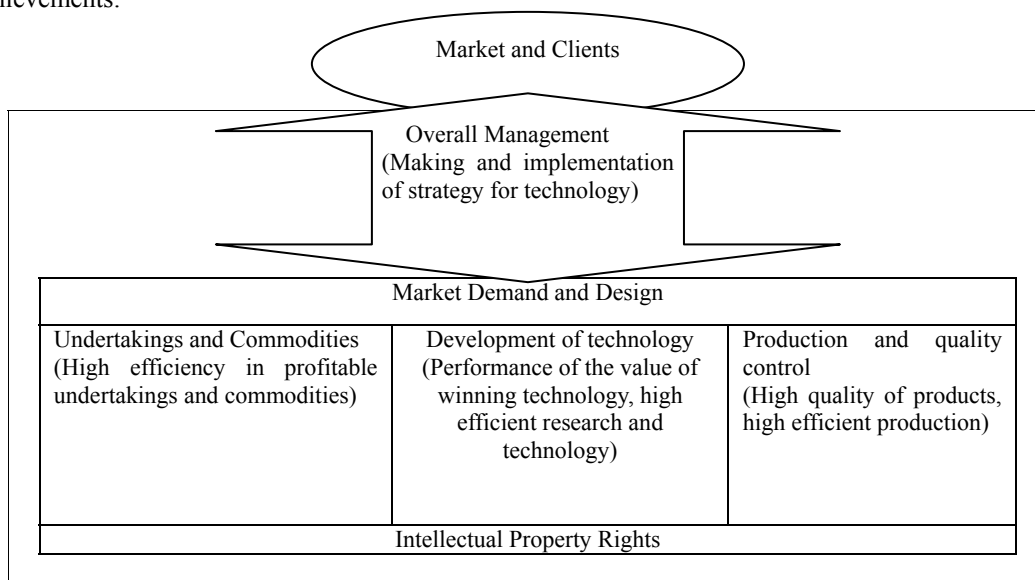


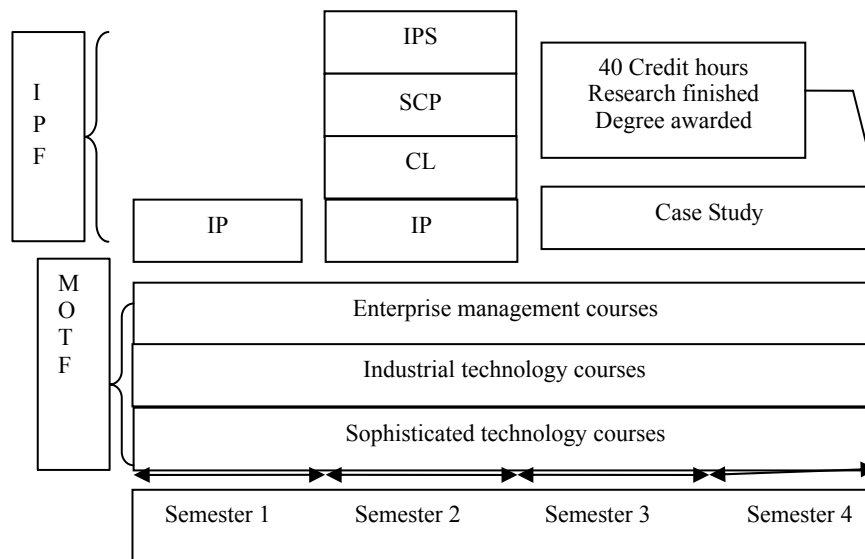
Figure 1 Philosophy and Connotation of MOT

## 3 The Positioning and Requirements for the Quality of the MOT Talents

The economic growth period of mass production and mass consumption will come to an end. The competitiveness brought forth by the pure technological improvement will be weakened, and the hi-tech content products brought forth by the diversified market will emerge and take the advantageous market place. Now the key research work is carried on the hi-tech products, and the new market relies on the

senior MOT talents. The traditional management ways are not applicable in the era when enterprises strive to create new technologies and new products, and put them into market for profits. In such circumstances, MOT comes into being and has become the main in the technological market. With the development of innovation in technologies, the competition in industries becomes fiercer, and MOT is welcome in enterprises, universities and governments in developed countries. Nowadays technology has a very important position in enterprises and in economy. MOT is the necessary management approach in all fields in the economic development.

To adapt to the free competition in the market economy and obtain the maximum profits, it is getting more and more important to develop the philosophy and cultivate talents of MOT. The MOT talents not only have the knowledge, but also have the management ability and experience in the most advanced technology market, which really embody their value. In MOT education, it is not enough only to teach knowledge, but the best way to cultivate senior MOT talents is to help them be fully aware of the importance of MOT and help them find out the approaches to solve the problems in management in the operation of MOT so that to develop insight into the philosophy and the essence. To enhance competitiveness of enterprises, we should not ignore the cultivation of entrepreneurs because the senior MOT talents in development of and investment in scientific achievements can play a key role in the process of commercialization of technological achievements. So it is critical to an economy to cultivate MOT talents who have the knowledge of intellectual property and management of technology, and good at technology and operation. From the curriculum of MOT master program in the Graduate School of Yamaguchi University (Fig. 2), we can see that MOT education lays emphasis on the integration of intellectual property, technology and management. The contribution by MOT to the conversion of technology to productive force is significant, which is proved by the practice in the development of the advanced countries.



**Figure 2 Two Year MOT Master Degree Program Curriculum**

Note: IPS --- Intellectual property strategy  
 SCP--- Solution to creative problems  
 CL --- Commercial laws  
 IP --- Intellectual property  
 LPF --- Intellectual property fields  
 MOTF --- Management of technology fields

The subjects of cultivation of the strategic management talents for commercialization of scientific research achievements are mainly technical university graduates and technical staff members, who receive knowledge about intellectual property, patent retrieval and patent application procedures, know the development trend of the sophisticated technology and technology management and have the strategic thought about management. MOT can promote the creation of new technology, the accumulation of technical assets and development of technological products. MOT is another form of renewal and preservation of technology system in an enterprise, and is very significant in restructuring

of new technology system, technological research and development, and creation of the value of the new technology. MOT is a power engine to commercialization of technology, technology strategy system, selecting research projects, building-up the management philosophy, knowing the trend of R & D of sophisticated technology, the exploration, development and production of advanced technology.



**Figure3 Three Strategies of MOT: Intellectual Property Strategy, Technology Strategy and Management Strategy**

#### 4 Conclusions

Education of intellectual property is the main in the education of MOT. With the economic reform and opening-up, the process towards market economy is going on and on, especially after China entered the WTO and the management of intellectual property (patents) has become more and more important. Enhancing the awareness of intellectual property is very important in protection and utilization of patents. We should disseminate to students, teachers and researchers the knowledge of intellectual property, the management skills, the development trend of science and technology, and the innovation approaches to research and education. Through studying the knowledge of law, we should enhance our sense of intellectual property protection, obtain the retrieval skills to get information about intellectual property, know how to apply for patents and how to evaluate the value of intellectual property, and promote the protection and application of sophisticated technology and intellectual property. Enhancing the awareness of intellectual property protection, we can avoid effectively economic conflicts with other trade partner countries, protect and utilize well the research achievements and the intellectual property rights to promote the development of the local economy and improve the ability of innovation and application of the intellectual property rights.

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