

2 Technological Strategy Management

In the conventional business strategies, “technology” was used as a management element. However, in recent times, management focusing on technology has emerged, and this is called MOT (Management Of Technology).

2 - 1 Creation of a Technology Development Strategy

MOT (Management of Technology) is management based on the concept that a company that expands its business by focusing on technology promotes **innovation** by investing in technological development, and develops a sustainable business.

- **Process innovation**

This refers to the innovation of business processes, such as the product development process, in order to continue with and expand business.

- **Product innovation**

This refers to the development of new innovative products to achieve differentiation from other companies. The techniques of product innovation include the concept-oriented technique in which the required technology is derived from a concept, and the technology-oriented technique that utilizes the unique in-house technology (i.e., **core technology**).

Technology development strategy is a strategy whose main objective is product innovation. The creation and implementation procedure of a general technology development strategy are as follows:

- 1) **Survey and analysis of the technology trend/product trend**

“In what direction and at what speed is technology progressing?” or “In what way does the progress in technology affect the market?” is analyzed and estimated by using the **technology portfolio**, **Delphi method**, or such other method, and the **core technology** is ascertained.

Information is also collected on successful cases of technology development and idea creation.

- 2) **Creation of a technology development strategy**

A technology development strategy is created in consideration of the balance between the two aspects of “What product to research and develop” and “What is the status of the market of the products to be researched and developed?” At this time, if the technologies possessed by a company alone is insufficient, the

strategy is created with a view to **technology acquisition** that uses external resources.

3) **Creation of a technology development plan**

A **technology development plan** is created on the basis of the management strategy and technology development strategy, and a **road map** which has a scientific backing and has reached a consensus, is created as a specific scenario.

4) **Implementation**

The **R&D (Research and Development)** department takes the lead in performing research and development according to the technology development plan. Evaluation is also performed on the basis of monitoring, side by side.

2 - 2 Technological Strategy Management Techniques

(1) Technology acquisition

Technology acquisition refers to the procurement of technologies from outside (e.g., other companies) when the technologies possessed by a company alone are insufficient. The techniques of technology acquisition include the following.

- **Technology tie-up**

This refers to sharing of technologies and joint development through partnership agreements between several companies. It is also called a technology-based **alliance** between companies.

- **Technology licensing**

This refers to the permission to apply the technologies possessed by other companies. Compared with a technological tie-up in which an equivalent relationship exists, there exists a somewhat hierarchical relationship in most cases.

- **Industry-academia-government collaboration**

This refers to a type of technology acquisition by which a company (industry) develops new technologies or new products, and sets up new businesses, in collaboration with a university (academia) possessing technology and high-level expert knowledge, and a public research organization (government), such as a governmental agency, independent administrative agency, research institute, or laboratory.

- **TLO law (Technology Licensing Organization Law; Act on the Promotion of Technology Transfer from Universities to Private Business Operators)**

This is a law that aims at promoting transfer the research results or technologies of a university to a private company venture in order to utilize the results or technologies. The country supports the industry/university mediation activities to

support the acquisition of patents and the transfer of technologies for an organization that has been approved and accredited by the TLO law.

(2) Technology development strategy

Technology development strategy is a strategy that is created to secure future competitiveness in the market. The typical technology development strategies include the following.

- **Patent strategy (Intellectual property right strategy)**

This is a strategy that improves the superiority of the technologies of a company by preventing imitation by another company through the acquisition of a patent for the technologies. In some cases, the objective of this strategy is to generate profits by obtaining patent license fees in the future.

- **Standardization strategy**

This is a strategy that one tries to establish the technologies of a company as de facto standards (or industry standards). It includes activities that increase the share in the industry through free publication of technologies, and activities that standardize the technologies of a company through a forum with other companies.

- **Coordinated strategy**

This is a strategy according to which technologies are supplemented through technology alliance with other companies and technology licensing when the technologies of a company alone are insufficient. Recently, as a result of the trend of globalization and technology integration, the number of companies employing a coordinated strategy within and outside the industry is increasing.

(3) Technology development plan

Technology development plan is an implementation plan that is created in view of the implementation method, protection of the technologies possessed, and implementation organization on the basis of the business strategy and technology development strategy. In the technology development plan, the plans described below are created and optimal distribution of management resources is performed.

- **Technology development schedule**

This refers to planning of the technology development. No matter how superior a developed technology is, it has no meaning unless there is a market need. Therefore, **concurrent engineering** that several processes are implemented simultaneously in

parallel in order to shorten the period, or **pilot production** that involves test manufacturing of a product by using a new technology, are also examined.

- **Technology development investment planning**

This refers to planning of the cost necessary for technology development. No matter how superior a developed technology is, it has no meaning unless the development cost is recovered and profits are gained. Therefore, an investment plan must be created in consideration of the return on investment (i.e., cost performance).

- **Technology development site planning**

This refers to planning of the sites for conducting technology development. The following are examined: setting up research and development centers, or establishing joint facilities with a technology alliance partner.

- **Human resources planning**

This refers to planning of the technology development staff. Since human affairs affect other activities, it is important to create an integrated plan from the employment of human resources up to their education and training.

- **Intellectual property right management planning**

This refers to planning of the management of intellectual property rights that arise as a result of technology development. A patent application plan is created in order to prevent the intellectual property of a company from being copied or imitated.

(4) Road map

A **road map** is a chart (or tool) that represents the routes during a particular period (e.g., approximately 5 to 10 years). The road maps concerning technology development are as follows:

- **Technology road map**

This is a chart that represents the route of technological progress. It serves as a policy of research and development of a specific technological field or product.

- **Product application road map**

This is a chart that represents how a developed technology can be spread to products.

- **Market road map**

This is a chart that represents the trend of market needs.

- **Patent acquisition road map**

This is a chart that represents the acquisition of a utility model and patent.