

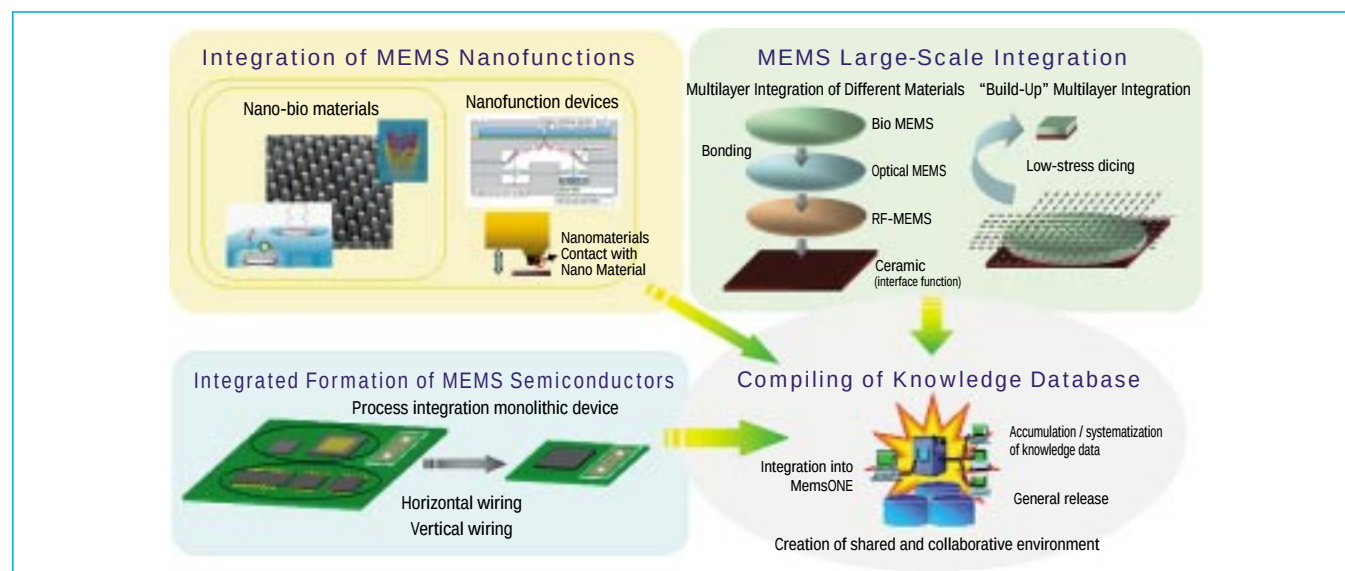
# Initiation of Fine MEMS project and Compiling of Knowledge Database

The Highly Integrated / Complex MEMS Manufacturing Technology Development Project was initiated in 2006 as a project commissioned and subsidized by the Ministry of Economy, Trade and Industry and the New Energy and Industrial Technology Development Organization (NEDO). The objective of this project was to use the technology for the manufacture of Micro Electro Mechanical Systems (MEMS) – key devices that will make a major contribution to miniaturization and performance enhancement of electronic devices and components in diverse fields that include information and communications, medical treatment, biotechnology, automobile manufacture and so on – in order to achieve breakthroughs in resolving development problems such as those shown in **Fig. 1** through complex technologies to implement nanofunctions, integrated construction with semiconductor chips, and methods to connect MEMS components in a highly integrated manner, in order to achieve further miniaturization, reduction of power requirements, and enhanced performance and reliability, as the next stage in MEMS development. This new stage has been nicknamed “fine MEMS.” (**Fig. 1**)

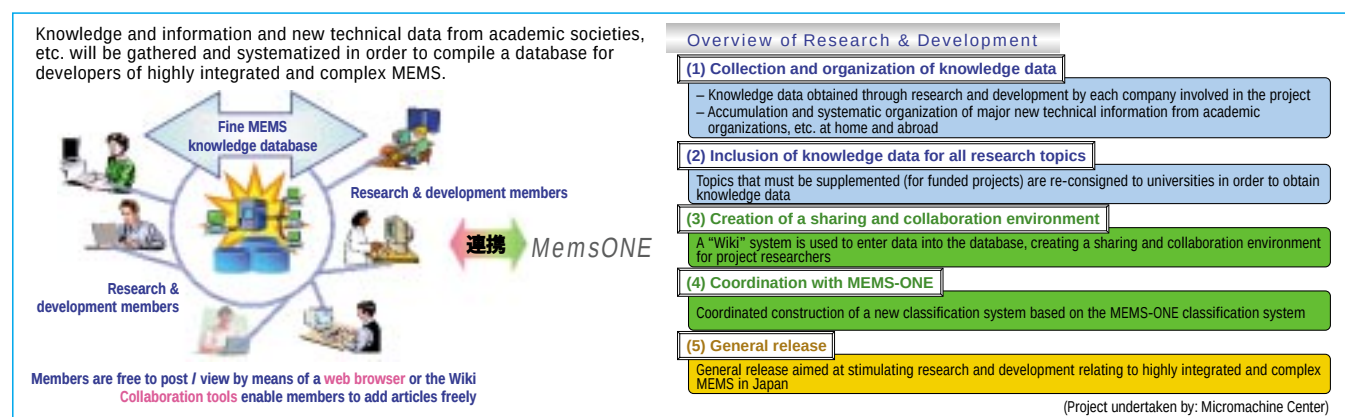
The Micromachine Center was commissioned to handle one of the issues relating to development: the compiling of a database of fine MEMS knowledge. The Center gathered information relating to manufacturing technologies that had been fostered in the course of the project, with the aim of making it available for widespread use by MEMS researchers and engineers in Japan to stimulate and achieve broad-based expansion of MEMS manufacturing technology in Japan.

Basic knowledge and data relating to MEMS are contained in the knowledge database for the MEMS-ONE analysis and design support system completed in 2006. However, the Fine MEMS Knowledge Database will be an additional collection of knowledge relating to complex technologies to implement nanofunctions, integrated construction with semiconductor chips, methods to connect MEMS components in a highly integrated manner, and other knowledge relating to highly integrated and complex MEMS, and therefore it will have higher requirements for quality and number of records stored. The leader of the project, Professor Isao Shimoyama of Tokyo University, was keenly aware of the importance of the project, and he spearheaded the effort to determine specific methods to accomplish its objectives. Entries were collected from companies involved in the project, and research and development activities for knowledge relating to this project were assigned exclusively to five university research centers that had a detailed knowledge of development issues relating to the project. In addition, information regarding international conferences, patents and so on was gathered by MMC researchers in an effort to ensure that the content would be as complete as possible. As shown in **Fig. 2**, a web-based “Media Wiki” system was also introduced to enable collaboration and exchange of information among researchers participating in the project in order to improve the quality even further.

The project is scheduled for completion at the end of 2008. The achievements of the project will be publicized throughout Japan. (**Fig. 2**)



**Fig.1 The Four Development Categories for Fine MEMS**



**Fig.2 Compiling of Knowledge Database for Highly Integrated / Complex MEMS**