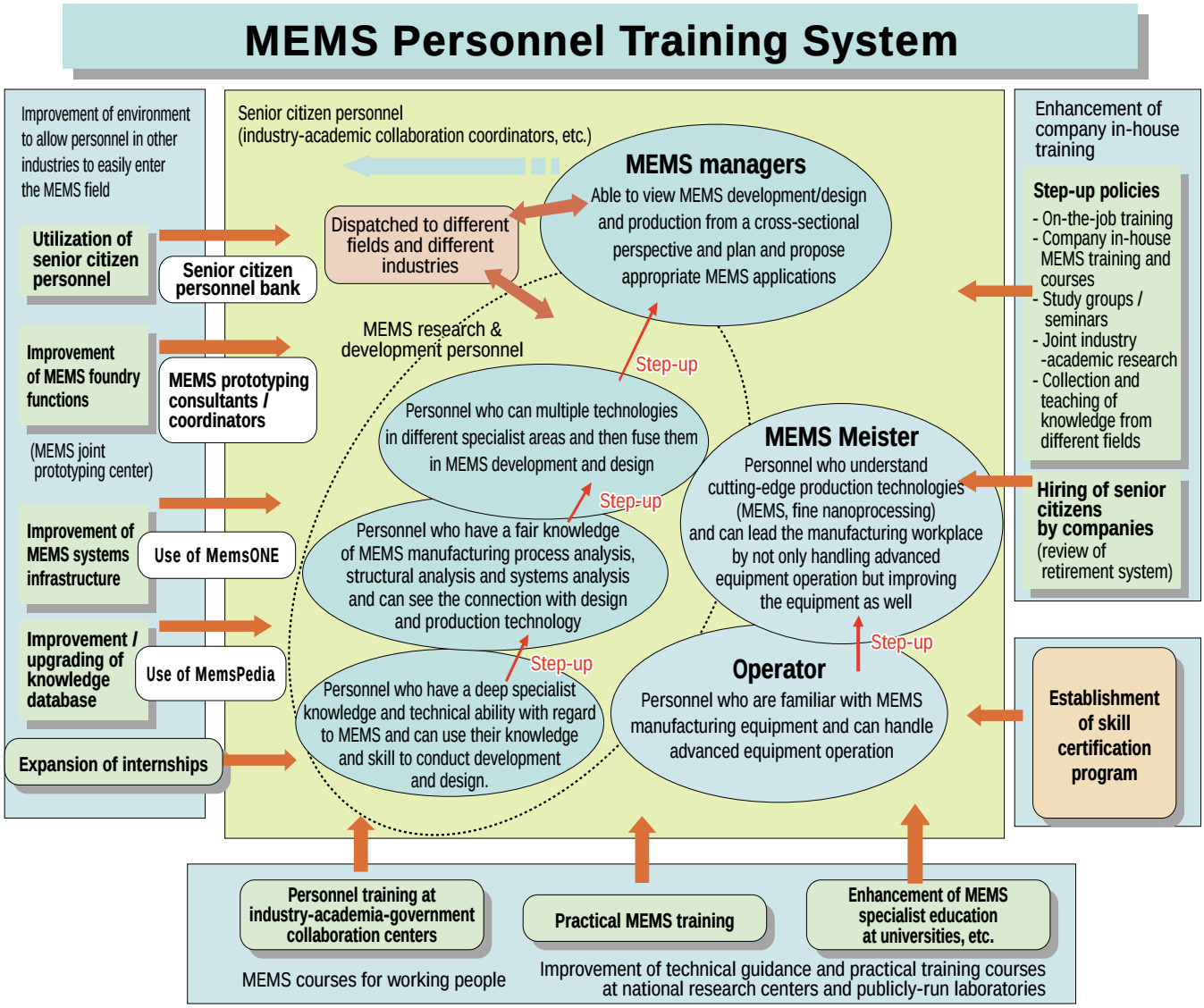
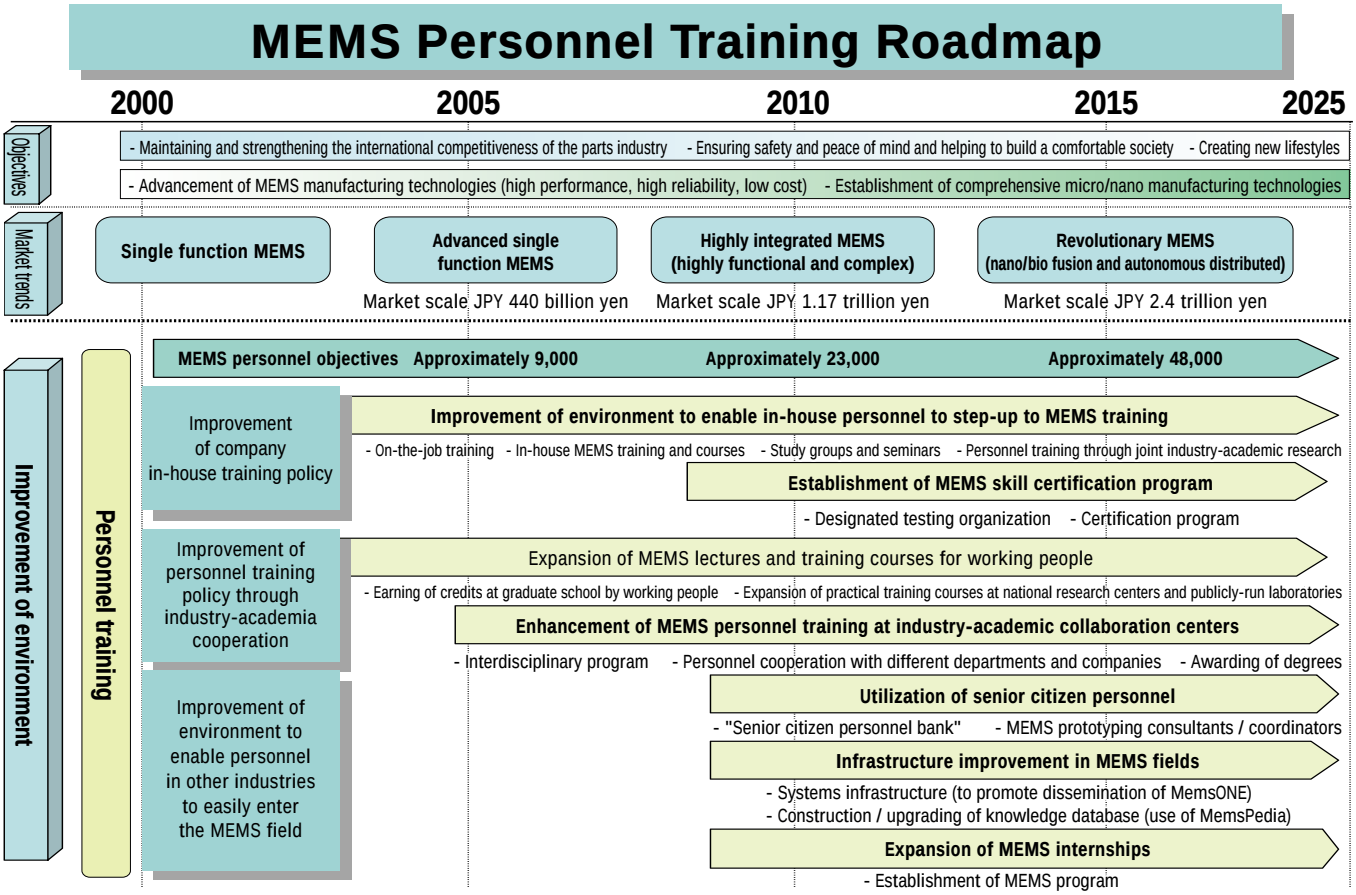
Personnel Training and Improvement of Foundry Functions to Accommodate MEMS Market Expansion

The market for Micro Electro Mechanical Systems (MEMS) – tiny, highly sensitive key devices with excellent energy conservation properties – is expected to expand in diverse fields such as telecommunications, automobiles, robots, medical care and biotechnology. However, knowledge and technologies in a wide array of fields including machinery, electricity, chemistry, physics, materials, optics and medical care will be needed for the development and manufacture of MEMS. The training of MEMS personnel who can take a comprehensive view of the entire technical development process will also be essential.

Securing of personnel in the MEMS field is a matter of pressing urgency in order to accommodate the expansion of the MEMS market. Taking this into account, the Micromachine Center studied the status of personnel training programs in the MEMS field that are currently being implemented by MEMS related companies, as well as the MEMS personnel training programs being promoted and supported by the national government. Based on the results, the objectives have been divided into two areas ("improving the environment for company in-house personnel training policies" and "improving the environment to enable personnel in other fields to easily enter the MEMS field"). A conceptual diagram of a MEMS personnel training system has also been prepared and this has been reflected in the technical strategy roadmap for MEMS fields.





Moreover, to accommodate the expansion of the MEMS market, it is essential to upgrade MEMS foundry services to make it easy for even companies that do not possess manufacturing equipment to actively engage in MEMS business. For this reason, a study of the current state of MEMS foundry business in Japan was also conducted. This study determined that the scale of use of MEMS foundries in Japan is currently estimated at approximately JPY 35 billion yen, and this is expected to increase each year along with the expansion of the scale of the MEMS market. However, the study made it clear that shortened durations and cost reductions are the biggest issues that must be resolved to enable the MEMS applications needed for creating new markets to be prototyped and verified as quickly as possible. Moreover, as overseas dedicated MEMS foundry companies are beginning to appear, the Micromachine Center put together a proposal emphasizing that there is an urgent need in Japan as well to upgrade MEMS foundry functions, through the creation of entities such as a MEMS joint prototyping center with MEMS development and prototyping functions as a mechanism for producing and supporting MEMS ventures.

The Micromachine Center also conducted a study for the purpose of establishing a mechanism by which, in cooperation with foundry companies, small and medium-sized companies and the like with little knowledge of MEMS manufacturing methods can submit a request to MEMS foundries and order MEMS of feasible shapes and sizes created using basic manufacturing processes. The Center also compiled a draft collection of standard process recipes (ready-made processes). The use of these standard process recipes is expected to reduce the cost of new MEMS manufacture and shorten deadlines and so on. A study will be conducted together with the use of these recipes in MemsONE.

Overview of Draft Collection of Process Recipes

Platform	Process Recipe	Device Structure	Sample MemsONE emulation
Device: Piezoelectric acceleration sensor			
Device: Electrostatic capacity type acceleration sensor			
Device: Micromirror powered by static electricity			
Device: Piezoelectric pressure sensor