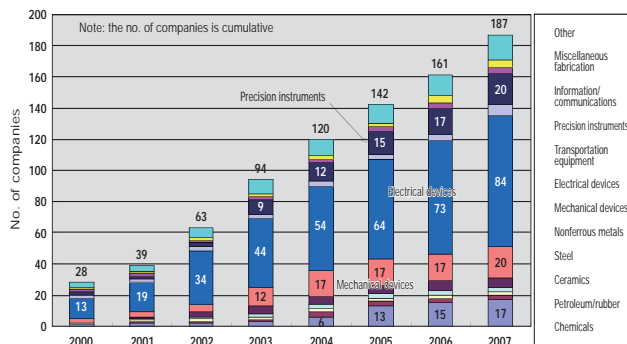


# Research Studies and Standardization Activities

## 1. Survey of Industrial Trends

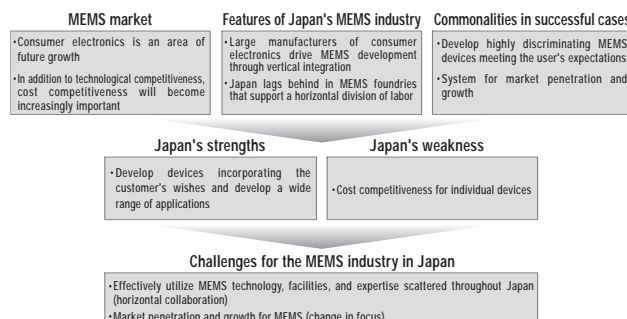
The Industrial Trends Study Committee is continuing its study begun last fiscal year on the types of tools employing MEMS technology (MEMS-Inside) and the uses for these tools (MEMS applications), as well as the state of affairs for MEMS-related businesses. The Committee compiled this information into its 2009 report on challenges and strategies for the expansion of Japan's MEMS industry.

MEMS has already been incorporated as a practical technology in numerous products, including such recognizable devices as airbag sensors for automobiles, print heads, controllers for game consoles, and image stabilizers for digital cameras, and many more applications are anticipated. Further, as illustrated in the following graph, the types of companies making up the MEMS industry are expanding into diverse sectors of business.



Japan's MEMS industry is configured of a group of dominant companies that follow a vertical integration model, as opposed to the horizontal division of labor employed in overseas groups, such as STMicroelectronics and foundries for analog devices and MEMS. Japan's model is less efficient because its technology, expertise, and facilities are scattered, and Japan does not conduct sufficient activities aimed at market penetration and growth for MEMS devices. Thus, in terms of cost competitiveness, which will be an important factor in the future of industrial competitiveness, Japan's model may be inferior to that used overseas.

To strengthen the MEMS industry in Japan, we must effectively utilize our technology, expertise, and facilities through collaboration between public institutions and businesses. It would also be ideal to have activities choreographed by industry and public institutions to facilitate Japan in changing its focus from technological and applied development through standardization to market growth and mass production.



## 2. Survey of Technological Trends at Home or Abroad (Second Semester)

In the second half of the FY 2009 survey of technological trends at home or abroad, the Committee conducted a survey of MEMS 2010 (the 23<sup>rd</sup> IEEE International Conference on Micro Electro Mechanical Systems). The 23<sup>rd</sup> conference was held in Hong Kong on January 24-28 2010.

MEMS 2010 drew 885 abstract submissions, which is the largest number in the history of the conference. By region, Asian had the most submissions with 425, accounting for 48%, or approximately half, of the total. From the submitted abstracts, 298 papers were accepted for an acceptance rate of 34%. By region, North America had 130 papers accepted for an acceptance rate of 46%, Asia had 113 accepted for a rate of 27%, and Europe had 55 accepted for a rate of 31%.

Fig. 1 shows the numbers of presentations by country over the past five years. Of particular note are the sharp rise in America's number of presentations and the steady increase in presentations from Taiwan and China.

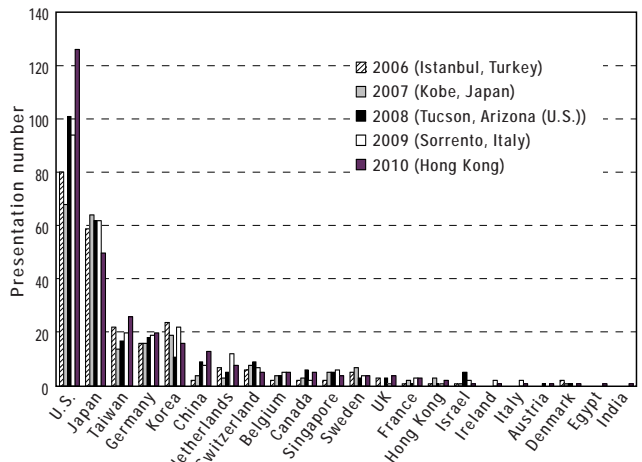


Fig. 1 Number of presentations by country over the past five years

Fig. 2 shows the numbers of presentations broken down by specific technological field. As can be seen in the graph, the three most popular fields were fabrication technologies (non-silicon), fluidic, and mechanical sensors.

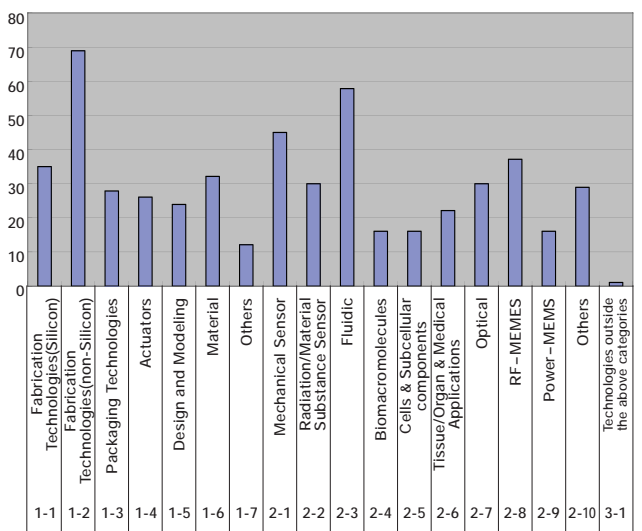


Fig. 2 Numbers of presentations broken down by field