Construction of a Fine MEMS Knowledge Database (DB)

- Goal: utilization and dissemination as industrial infrastructure -

The Highly Integrated / Complex MEMS (Fine MEMS) Manufacturing Technology Development Project is a three-year project being conducted in FY 2006 - FY 2008. Commissioned and subsidized by the New Energy and Industrial Technology Development Organization (NEDO), this project aims to establish the technology that will enable the manufacture of highly integrated and complex MEMS devices that are compact, conserve energy and offer high performance and high reliability. The Fine MEMS Knowledge Database Construction Project is also being promoted in connection with this project, with the goal of organizing the achievements and knowledge gained through research and development in the Fine MEMS Project and information regarding international conferences and so on in database form to provide an environment that can be employed easily by researchers and engineers working to develop and manufacture fine MEMS.

To ensure that users are able to use the knowledge database easily, and to promote ongoing updating of the knowledge data in the database, it is essential to construct an environment that allows joint collaboration by multiple users at the same time and does not require special applications or knowledge of specialized nomenclature. As shown in Fig. 1, a major feature of the database system, is the introduction of a web browser / MediaWiki system – the same type of system as the Wikipedia free online dictionary – as the infrastructure for achieving this database, enabling data to be viewed and updated easily by anyone with an Internet connection. The basic premise of the system design is that, once information has been disclosed publicly on the Internet, it will be added to the MemsONE knowledge database to enable efficient use and dissemination.

By FY 2007, more than 1000 items of knowledge data had been registered to the MemsONE database, exceeding the target of 1,000 items. The stored data has been organized around four MemsONE categories (process, device, material properties, analysis) using keywords developed in this study. The knowledge data is also being augmented through the addition of laid-open patent data and Western patent analysis references corresponding to development topics. To enable users to quickly locate the information they need, a full text search function using a precision Japanese language search engine and various types of ranking display functions that allow visualization of the status of the data stored in the database have been provided. In the remaining six months of the database construction project, efforts have focused on improving the quality of the registered data, updating patent data, building a top page for general Web access and creating terms of use and guidelines, and the work is progressing at a fever pitch. The database will be made available on the Internet at the beginning of FY 2009, and activities to encourage ongoing improvement of the knowledge data will be conducted to enable the database to be used as a part of Japan's industrial infrastructure.

Fig. 1   Construction of an Internet-based Shared Collaboration Environment

Fig. 2   Overview of Knowledge Database System and Upload Function