

# Advancements in Nanotechnology Catapult MEMS-based Applications

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The burgeoning interest in micro technologies, partly triggered by the rapid growth of nanotechnology, is opening up a floodgate of opportunities for developing new, micro-electromechanical systems (MEMS) based applications and products.

"The hunt for the 'next big thing' is on," says Technical Insights Analyst Jagan Ramaswami. "MEMS – particularly bio MEMS, RF MEMS, and optical MEMS – are potential candidates in the search for a 'killer application' by the research community."

MEMS-based applications have the potential to rejuvenate the market just as the Internet did over the last two decades of the previous millennium. Additionally, the emergence of nanotechnology could encourage the innovation of a gamut of new applications.

It is only a matter of time before nanotechnology offers a viable solution for various industrial needs. When it happens, MEMS sensors are likely to facilitate intermediate communication between the nanoscale and macroscale world. This is also anticipated to help users overcome technical glitches that may arise during the communication process.

With nanoscale fabrication and molecular manufacturing gaining popularity, the cost of many such devices is expected to fall, leading to increase in volume and market growth. However, the real impact of this market driver is inherently tied to the success of nanotechnology.

The advent of better micromachining processes has made the manufacture of smaller and more versatile components economically viable. The automotive accelerometer is an excellent example of a device that has gained immense popularity due to its low cost of manufacture.

Systems-on-a-chip is another recent advancement in the MEMS arena. Integrated manufacturing of electronics and sensors on the same silicon wafer is likely to lower the cost of control systems.

“Integrating sensors, process circuitry, and communication capabilities on the same chip or silicon wafer is close to realization and prototypes have already demonstrated the feasibility of such systems,” informs Ramaswami.

Large-scale manufacturing of these systems at lower costs is quite possible and the day might not be far when consumers have handheld devices capable of sensing any chemical, gas, or biological agents present in real time.

“Countless possibilities of discovering entirely new properties and applications exist as the world of nanotech is immensely smaller than the world of micro-tech,” says Ramaswami. “In fact, the growth is so rapid and enormous that nanotechnology is already emerging as a contender for MEMS in many application areas and market developments can get only more exciting from here.”

Hence, the need of the hour is an objective evaluation of the prospects and their balancing against the ground realities, to enable the MEMS sensors market to flourish. The industry needs to exorcise the ghosts of the telecom crash and move forward driven by an optimal combination of market, technology and product focus.

Global MEMS Sensors Developments and Opportunities, part of the Semiconductors Vertical Subscription Service, provides a comprehensive overview of advancements in MEMS technology worldwide. It provides details on current and future research projects in this exciting arena while examining market drivers, restraints, key applications, and technological trends. Executive summaries and interviews are available to the press.

If you are interested in an analysis overview which provide manufacturers, end-users and other industry participants an overview, summary, challenges and latest coverage of Global MEMS Sensors Developments and Opportunities - then send an email to Julia Paulson – North American Corporate Communications at [jpaulson@frost.com](mailto:jpaulson@frost.com) with the following information: Full name, Company Name, Title, Contact Tel Number, Contact Fax Number, Email. Upon receipt of the above information, an overview will be emailed to you.

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