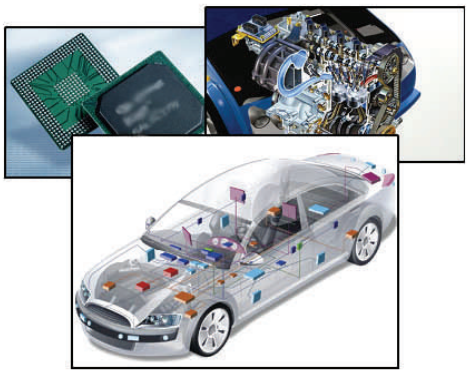


Competitive Trends in the Microcontroller Industry

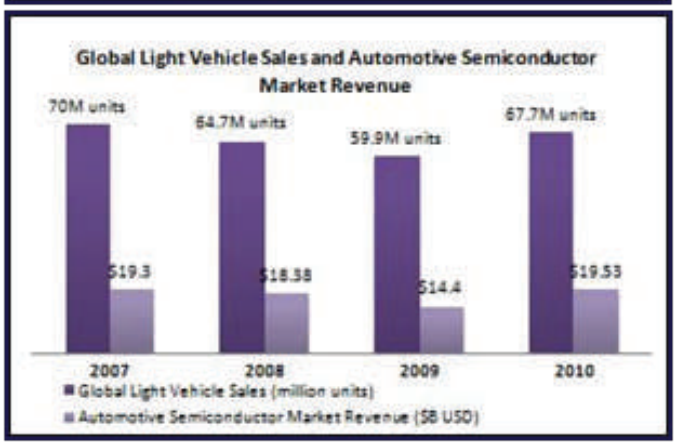
What factors contributed to the success and advancement of firms in the microcontroller industry in 2010 and beyond? Fletcher/CSI Technology Practice examined these factors including their functionality trends for automotive MCUs, emerging markets, and additional growth opportunities.

Environmental Considerations Accelerate Innovations in Automotive MCUs

The evolution of automotive microcontrollers has been rapid in response to increased demand for fuel efficiency, fewer emissions, safety features, and enhancement of driver/passenger experience. The challenge for leading MCU providers is to continually increase the ratio of computing power to energy consumption of its automotive lines, to keep pace with the increasing complexity of "infotainment" – the electronic in-cabin experience – and renewed consumer sensitivity to the total cost of ownership associated with a new vehicle purchase.

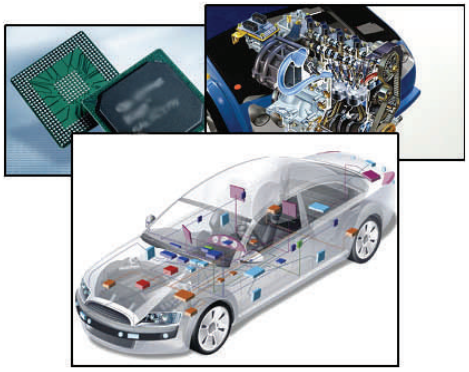
Key development factors for automotive MCUs include increased environmental endurance and low standby power consumption. Versatility among families of automotive MCUs will increase their applicability across different types of vehicles in different physical climates. As the "do more with less" cultural ideal continues to pervade consumer spending habits, auto manufacturers will continue to prefer MCUs that offer a strong combination of computing power and energy efficiency.

Some analysts[1] expect the automotive semiconductor market to grow in 2010 to $19.53 billion, up 26% from $14.4 billion in 2009. Production volumes and sales of light vehicles are key indicators for the industry. After recording the largest sales decline in global light vehicle history in 2009, sales increased in early 2010 as countries passed economic stimulus bills to increase consumer sales. 2010 sales forecasts in pan-European countries and the United States are being adjusted down, and may not reach previously forecasted levels. BRIC (Brazil, Russia, India, China) will make up approximately one-third of sales in 2010. Automotive semiconductor sales should continue to closely align with light vehicle sales trends as these emerging markets drive demand.



Rapidly Advancing Industry Focused on Functionality

Compared to the personal computing market, the only way the industry can advance as a whole is through continuous and rapid innovation, which produces short product lifecycles and sliding scale pricing models. In light of these market forces, the industry has an acute focus on power optimization and low-power capabilities (smarter functionality, reduced expense).



This ideal is limited by the fact that high-end innovation will be driven by 32-bit MCUs with higher amounts of embedded memory. However, since most auto manufacturers place bulk orders for tens of thousands of MCUs at once, price sensitivity is often overshadowed by the need for superior functionality, especially if semiconductor manufacturers have a highly scalable MCU family. This does not mean that demand will completely subside for 8-bit and 16-bit models, which will still appeal to smaller budgets and less complex applications.

Emerging Markets to Influence Future Growth

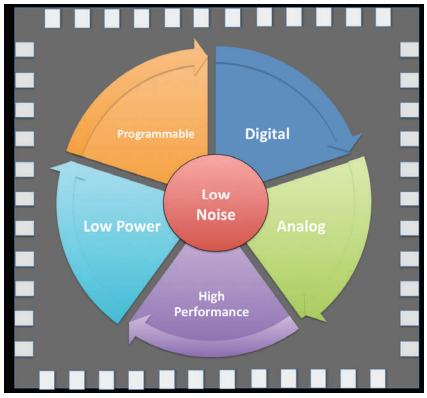
China and India have large volumes of motorcycle and light vehicle owners, and the activities of consumers in these countries will have a large influence on the future performance of the automotive MCU industry. Indian auto manufacturers, such as Tata and Mahindra, design low-cost products targeted at India's middle-class and rural populations, and domestic consumers are increasingly fond of more robust electronic functionality within these light vehicles. India and China are among the world's largest markets for 2-wheel vehicles (the majority of which contain at least two MCUs), and capturing/maintaining market share in these countries should yield very large returns for automotive semi-conductor companies. Four-wheel vehicles are also a consideration in these markets, but not to the extent of 2-wheel vehicles, which echo the "do more with less" consumer mentality.

Industrial MCUs, Current and Future Trends in Development

While the automotive MCU market experienced highly positive year-over-year growth compared with 2009, industry leaders such as Freescale, Renesas/NEC, and Infineon also look to increase their presence in the Industrial and Multi-Market MCU segment. The segment ranges from common consumer appliances to complex medical equipment, and one of the main themes of development in this segment is Mixed Signal Integration (MSI). MSI enables MCUs to interface between analog and digital signals, and the more efficient the process is, the lower the power consumption of the unit. Energy-harvesting techniques, where MCUs must interface with unreliable or scattered power sources, are rising to the forefront of MSI innovation and will enable deployment of MCUs in locations where wireline electricity is not ideal. Wireless connectivity is also a standout issue among manufacturers, including more products offering integrated Ethernet, Wireless, CAN, and USB.

FCSI Insights

The pace of innovation in the microcontroller industry has picked up considerably as a result of renewed consumer focus on smart spending and energy conservation as hybrid and electric cars, motorcycles, and other light vehicles become increasingly popular choices for purchasers worldwide. Companies with proficiencies in automotive MCUs have an opportunity to transfer those proficiencies into new Industrial MCU product lines fit for wireless, appliance, medical, and energy metering applications. Semiconductor companies will achieve success through a mixture of scalable MCU families, robust software architecture, mixed-signal integration, wireless capabilities and attention to emerging global markets.



[1] Gartner, Semicast, Strategy Analytics