PREFACE

Perceiving major trend of technology

Managing director
Tohru OGAWA

In the car electronics field regarded as our business, changes accompanying the rapid development in IT technology are causing a large paradigm shift. Here are three trends with possible major changes.

The first trend is integration of the functions of about 100 individual ECUs in vehicles into some ECUs (engine control system, motion control system, safety control system, body control system, multimedia system, etc.). This aims for the improvement in efficiency, economy and functionality by integrating and concentrating ECUs that used to be functionally independent. Looking at the new services to be provided in the future: for example, changing the music to match a driver's condition (e.g. change to up-tempo music), changing the temperature / wind direction / air volume of air conditioner or vibrating driver's seat in case of driver's sleepiness being detected, they require close link among multiple ECUs such as between the body control system ECU and multimedia system ECU. This means that software in the ECU filed is increasingly important. These movements are also seen in the linkage technology among distributed servers, and are like the movement between "integrated processing" and "distributed processing" such as downsizing from mainframe which has been repeated in the world wide IT field. So, it is considered that the similar changes as the cases above will occur.

The second trend is networking. The network surrounding cars is expected to cover a wider area. MOST, CAN, LIN, AVC-LAN and others are already used as in-car LAN. Besides, IDB1394, FlexRay and others are being put to practical use as higher-speed and larger-capacity LAN, and the use of optical fiber is also being promoted as a new communication medium. The new technology of by-wire control requires higher-speed and more reliable LAN that has a strong affinity with high-reliable technology used in communication network and others. Looking at the network linking cars to the outside in real

time, various developments are expected. They are, for example, linkage with mobile phone or airwaves beyond the conventional broadcast reception, further connection to the Internet via carrier network, and reassuring / safety ITS system cooperating with infrastructure via road-to-car / car-to-car communication. These networks will achieve new services such as remote maintenance service, fault diagnosis, remote upgrade, antitheft service, and fuel-saving drive assist, and furthermore, they will realize the concept of next-generation remote service system with tools and information integrated via network / communication.

The third trend is another application of IT technology that contributes now to various stages such as development / design / evaluation, besides being directly applied to in-car devices. So far the IT technology has been utilized as a design / evaluation tool such as CAD. In the future, it will be increasingly required to improve the efficiency of development in accordance with the system becoming enormous or to shorten the development period by reducing prototyping. As a measure to solve this problem, utilization of simulation technology in various stages is expected. It is said that a new development age without prototyping will come, as the new simulation technology accumulated by aircraft development will be effectively utilized for automotive development. Under these circumstances, we are expected to grasp the trend properly and challenge the new technology boldly in various stages of our planning / development / designing / evaluation.

It is common knowledge that the electronic technology in component has been developed from vacuum tube to transistor, IC, LSI and highly-miniaturized LSI. Besides, coupled with developments in software technology, the rapid IT technology evolution leads to a large paradigm shift. At a time like this, the excessive concentration on improvement of conventional technology may cause a significant business risk. To expand our businesses, innovative technology must be developed and applied by grasping technology trend. For its realization, it is important to perceiving major technology trends with a broad view by drawing upon the related conventional technology progresses, and to acquire some keen insight into its direction.