Automotive Electronics Industry Looks Good

In this story, we discuss the scope and opportunities in the field of automotive electronics, entry-level roles for freshers and skills expected of them. We also bring to you some suggestions from industry experts

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The last decade has shown that the electronics in automobiles have multiplied at an astonishing rate. Electronics pretty much influence all functionalities in a vehicle. Some of the reasons driving this trend are — precision, timing, efficiency, standards, safety, comfort, user experience and connectivity. Also, this is in-line with the insatiable desire for gadgetry amongst consumers.

"This trend will definitely continue, perhaps at a much accelerated pace. Automotive semiconductor sales will boom to $40 billion by 2014. It is estimated that close to 80 per cent of the innovation in automobiles will be in electronics," says Basavaraj Garadi, chief expert, Robert Bosch Engineering and Business Solutions.

Therefore there is no denial of the fact that the future of automotive technology lies in the hands of electronics, thus offering significant scope for professionals to grow and thrive in the automotive electronics industry.

Scope and opportunities

There are scores of Tier-1 and Tier-2 companies actively contributing to the booming electronics in the automotive industry. There are companies engaged in engineering activities, developing new electronic functions in the vehicles and there are also companies producing electronic control units (ECUs), which realise these functions in the vehicles. In addition to these companies are the ever-growing automobile manufacturers. Garadi adds that, "As per the current figures,

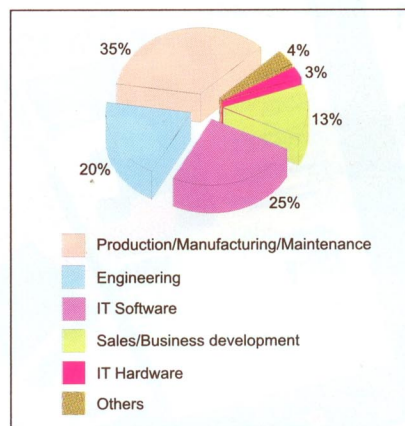A view of Bosch Automotive Electronics India factory

Fig. 1: Share of top five functional areas hiring automotive electronics professionals (Data courtesy: TimesJobs.com)

SIAM — the Society of Indian Automobile Manufacturers, has 46 members who are the leading vehicle and vehicular engine manufacturers. All of these provide ample opportunities for employment to the fresh graduates passing out of universities."

Today's car is an extension of the smartphone with facilities such as Bluetooth integration, multimedia playback and routing, which opens up interesting career avenues in the in-

dustry. Garadi shares, "In fact we have been seeing frequent advertisements of car manufacturers showcasing the new electronics infotainment features at major events such as CES '14 in Las Vegas."

"There are huge opportunities in the automotive industry as it is leveraging the recent updates in the consumer electronics industry. We are currently witnessing a lot of consolidated CE technologies being moved into automotives," informs Ravindra B.S., lead architect, Mistral Solutions.

Entry-level roles and training

For fresher engineering graduates, there are opportunities of working on car telematics, electronic car control and car communication with the outside world. With respect to the entry-level roles at Mistral Solutions, Ravindra says, "Entry roles can include maintenance, verification and validation of hardware/software developed using standard life-cycle models."

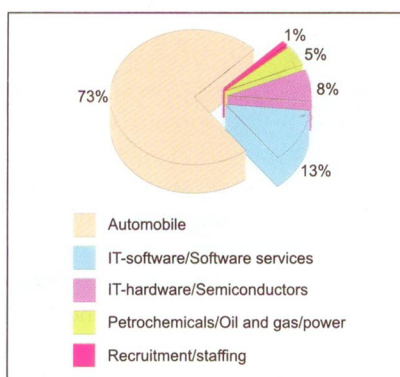"Robert Bosch Engineering and Business Solutions Limited (RBEI) re-

Fig. 2: Share of top five industries hiring automotive electronics professionals (Data courtesy: TimesJobs.com)

Fig. 3: Share of top five locations hiring automotive electronics professionals (Data courtesy: TimesJobs.com)

Fig. 4: Salary breakup of automotive electronics professionals (Data courtesy: TimesJobs.com)

cruited close to 700 fresh engineering graduates passing out of universities in the year 2013," informs Garadi. He says, "Almost all of them would be engaged in engineering activities—some involved in hardware design, some in the software design and the rest engaged in the mechanical design activities. There are also some engineers involved in relatively new but rapidly growing area—mobile apps development."
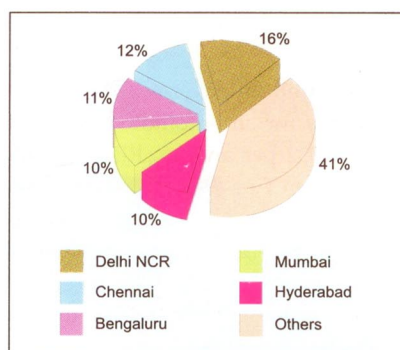
When fresh engineers come on board, they may operate as junior development engineers undergoing intensive training—the first month being spent on induction training when they get exposed to a common set of topics, especially dealing with automotives and the engineering processes and procedures.

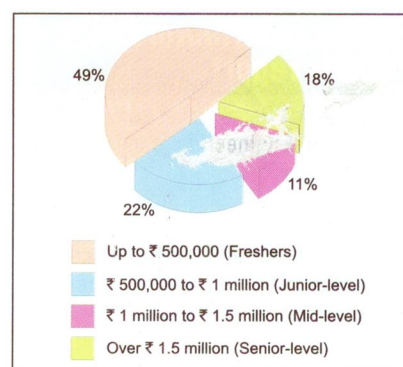Subsequently, they are assigned to different areas where they undergo on-the-job training for a few months in entry-level engineering tasks under the tutelage of senior engineers; each getting exposed to one specific area within the automotive technologies such as power-train, body electronics, active and passive safety and infotainment.

Demand areas

Due to the nature of the work, most jobs are concentrated in the auto manufacturing hubs of Delhi, NCR and Chennai. While core engineering skills

are valued, softer skills of concept selling and relationship management are also required by the bigger OEM companies. Vivek Madhukar, COO, TBSL (which operates TimesJobs.com) explained, "Automotive electronics is a highly specialised field, and companies seek very specific profiles in this domain—offering high starting salaries and good career growth."

According to the data provided by TimesJobs.com, the top industries hiring verification and validation engineers form the core automobile electronics industry with about 73 per cent share of jobs, followed by the IT software/software services industry with a share of 13 per cent. IT-hardware/semiconductor and petrochemicals/oil and gas/power industries have 8 per cent and 5 per cent of the jobs, respectively.

Apart from Delhi and Chennai that feature in the list of top locations for jobs in automotive electronics field with 16 per cent and 12 per cent, respectively, Bangalore, Mumbai and Hyderabad compete with 11 per cent, 10 per cent and 10 per cent of the jobs, respectively. Remaining jobs are spread in other locations.

Pay package

According to the stats provided by TimesJobs.com, 49 per cent jobs are for freshers with a pay package between ₹ 190,000 and ₹ 450,000 per annum. Twenty two per cent of the jobs are for professionals with at least two to three years of experience, who are paid between ₹ 500,000 and ₹ 1,000,000. Eleven per cent of the jobs available in India are for mid-level experienced professionals whereas the remaining 18 per cent of the jobs are for seniors in this industry.

As found on payscale.com, the average pay for an automotive engineer is ₹ 390,652 per annum. RBEI recruits mainly from Tier-1 and Tier-2 engineering colleges, and these cater to most of the software, hardware and mechanical design activities. The IITs and NITs cater to around 5 per cent of the annual requirement, and these engineers engage in tasks demanding high ability to solve core engineering problems by delving deep into engineering principles and designs systems through creative and innovative thinking.

Therefore, Garadi says, "Pay packages vary too much in the industry for any price point to be relevant. However, we can say that it is comparable to any other engineering domain."

Skills expected

Modern-day industries, including automotive, demand multi-skilled engineers handy with both core engineering as well as IT engineering. This has led to the birth of a new branch of science, particularly popular in the automotive industry, called mechatronics. It is a combination of mechanical, electronics, control and computer engineering. Almost every subsystem in a vehicle is moving from a pure mechanical system to a mechatronic system. Garadi says, "Therefore future of the automotive industry lies in the confluence of multiple fields of engineering, and an engineer aspiring to score in the automotive industry has to be multi-skilled or, in other words, should be a mechatronics engineer."

Ravindra adds that, "For a fresher, we expect the person to be strong in communication standards, C/C++, microcontrollers and MEMs-based sensor technologies. Experienced graduates in this domain will need experience in developing hardware/software as per established standards of the automotive industry; hands-on experience in one or more programming languages and experience in building real-time operating system (RTOS) based products amongst others."

Expert advice and suggestions

These days a big chunk of engineers recruited in the automotive domain broadly fit into the IT category. They write software code to solve real-world problems and implement systems. These software can run on desktop computers or on on-board computers (also referred to as ECUs). They deal with real-world data and signals, and interpret, analyse and process these to realise complex functions. Garadi explains that, "For these functions to be effective, efficient, accurate, repeatable and reliable, engineers have to apply mathematical, scientific and technological skills." They need sound theoretical approach for introduction of new ideas and concepts.

All of these amount to core engineering skills. IT engineers, in order to make a good job of what they are working on, should be in a position to understand, visualise and appreciate the engineering principles. More complex the systems are, deeper you may have to delve. Lest, the work-piece would only turn out mediocre. Garadi says, "For example, the engineers engaged in developing software for the vehicle exhaust management need to understand the principles behind chemical processes, fluid dynamics, thermal engineering, etc. Likewise, engineers writing software for the engine management systems would do well to have basic engineering skills associated with combustion, kinetics, kinematics, traction, etc."

On another note, Ravindra says, "For people interested in the field of automotive electronics, there is currently a lot of excitement with several new technologies being developed and integrated into future automotive devices. It is important that the graduates be strong in fundamentals of communication software engineering since the product developed will ultimately go into a vehicle, and this involves the safety of the people on board." ●

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