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Engineering Tasks Keep Moving to the Suppliers

Gary Breed
Editorial Director



Applications engineers at supplier companies have always been important. Many of the best known “classic” technical references are application notes from component, instrument and software companies. Today, the importance of that specialized knowledge is greater than ever—even replacing typical design engineering that has traditionally been done at the OEM companies!

This trend has been developing gradually for many years. To appreciate the magnitude of this shift in core high frequency expertise, all we need to do is list some of the specific reasons:

- Higher levels of integration, and a growing range of available technologies at the component level.
- More complex communication systems, supported by similarly complex EDA tools and instruments.
- The desire to add wireless communications functions to a wide variety of product types—quickly, easily and cheaply.
- The sheer number of high frequency applications, which has diluted the pool of available engineers who have the necessary expertise.

Most of these reasons mean *more*—more information needed, more specialization required, more work to be done. All this “more” stuff needs to be done in *less* time and with *less* staffing! This is an equation that does not balance at the OEM level. It requires more capability in the engineering tools and components that are purchased, and more help from the applications specialists at the supplier companies.

I won’t characterize this situation as a problem, except the part about the diluted pool of engineering talent. But, it is a change in the way companies do business and the way engineers do their jobs.

Fifteen or twenty years ago, new engineers usually started their careers working on one building block—one specific function in a larger system. As they gained experience, their responsibilities broadened to include more of the system. Eventually, as an experienced engineer or manager, they would get involved at the start of the process, creating an

overall system architecture and its performance specifications. Then the individual elements of the project would be parceled out to a new group of young engineers.

Now, the opposite is often true. A new engineer may be involved in development of the overall design architecture—the “big picture”—instead of concentrating on one small piece. With more functionality at the component level, an OEM engineer’s job includes fewer small pieces that need to be designed from scratch. Instead, his or her job is to identify the functionality and performance needed in those pieces, which are now acquired as complete functional components.

To address this change, this month’s tutorial article offers notes to help new engineers appreciate top-down design methodology that was previously reserved for the

most experienced engineers and managers. The process is very different from university classroom and laboratory projects. Dealing with a wide range of technical matters can be a daunting challenge, as can the need to change from the one-way process of learning, to the type of two-way interaction needed within a diverse design team.

Engineering at the Supplier Companies

One major point of this commentary on changes in the classic OEM engineer’s job is that those tasks are not gone. They have simply moved to another place, often using very different technologies—integrated circuits, multi-chip modules, low temperature co-fired ceramics (LTCC), chip-and-wire hybrids, etc.

In addition to knowledge of spe-

cialized manufacturing techniques, engineers at these companies are the top experts in their particular design niche. For example, it only makes sense that a company making mixer ICs have a top mixer designer who can work closely with highly-qualified chip designers to achieve the best result. This sounds pretty good if you are an OEM looking for the best device to incorporate into your next product!

Hopefully, all new engineering graduates are aware that they are entering a dynamic work environment. Although there may be fewer “traditional” jobs, there is now a much broader range of opportunities at companies large and small, OEM and component-level. And those jobs may have very different requirements than typical jobs of just one generation ago.