

Design in a connected world

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We live in an information-based society, where app-driven cloud-based ubiquitous computing is in the palm of almost every hand and in many of the devices around us. The design engineering community needs to address that reality with products that serve the customer's expectations by not only delivering the desired functionality but also properly using the technologies and systems involved in the most cost-effective manner possible.

No EE today designs in a vacuum. Nearly every advanced electronic product today must not only provide its core functionality to a user, it must increasingly operate in a network (almost always wireless) and use its infrastructure to provide major portions of its functionality as well as deliver communications and networking capabilities to the user as well. That means that the designer must understand and accommodate not only the needs of the customer, but must also factor in the needs of the device and how it uses the available wireless infrastructure to best handle its tasks in the most cost-effective manner.

That means that hardware designers must understand and use software not only in the design and creation of the product, but in its operation as well. Software is now used to set up and test the product as well as to implement the control and management functionalities, so the designer must implement software not only to simulate and test the hardware of the product in development, but the software functionality for core functions as well as the user interface.

The issue gets more complex when one considers that advanced products often have more than one layer of network and communications: one for the user, and one for the device itself. Today many advanced consumer products must provide an interface for the user to operate them, but must also provide an avenue for the manufacturer to go in and tweak things if needed after the product has shipped. In the "internet of things" paradigm, inter-device communications for housekeeping and other infrastructure tasks form another layer of networking that is invisible to the user, but a very real concern for the designer.

The bottom line is that when designing a product for the connected world of today one cannot forget not only the communications functionality for the user, but the

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ability of the device to operate on its own as an integrated member in the larger dataspace as well.

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