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Live Wired

As technology grows “smarter” by the second, designers seek new ways to futureproof domestic wiring systems.

BY ADRIENNE J. REWI

Part of a larger “smart technology” movement, structured wiring is becoming more of a reality as capabilities go up and prices go down. By networking everything electronic from a central hub, structured wiring lets homeowners access the Internet simultaneously – from five separate computers. They can save thousands of dollars by utilizing one DVD player, printer and scanner for all televisions and computers in the house. They can operate their security system, lighting and heat and air conditioning from a single keypad. Structured wiring is its own sub-specialty and requires its own experts and installation. Understanding and planning for its arrival is one of the foremost challenges in the residential design field.

“There isn’t a project we’re working on now that doesn’t involve a lot of technology,” says Lewis Goetz, FIIDA, FAIA, Past President of IIDA and Principal of Washington, D.C.-based Group Goetz Architects. Yet Goetz acknowledges that most designers don’t understand enough about smart technology – or how to apply it. His practice emphasizes commercial work, but the same truths apply to domestic environments. “I’m a great advocate of technology,” he says. “But I probably don’t know enough about it. We have an IT department, and I look to them

to put us in touch with the latest developments and the best systems. We bring in consultants who specialize in new technology and wiring systems, so it’s been a learning experience for me too.”

NO ‘I’ IN ‘WIRE’

At the heart of the learning curve is the ability to work as a team. Twenty years ago, one person designed a whole house. Now, as technology and homes become more complicated, many design practices have a team comprised of many specialists, with each specialist focusing on one aspect of the project.

In his article featured on *Architectmag.com*, Chip Chapman, Building Technology Design Consultant and founder of Columbus, Ohio’s Integrated Building Systems, suggests that, “As part of the future, new strategies, standards and partnership will have to be developed, and architects, interior designers and consultants will have to work together. Owners just don’t know what they don’t know,” he says. “They just assume that architects and the professionals that are working with them know what’s going on and are going to help them in making the right decisions. They expect designers to make smart decisions about infrastructure, space, power requirements and HVAC requirements. Design firms who are using technology consultants will have a competitive advantage.”

Soon, even average households will need a communication systems expert when planning a new house, according to Architect Katherine Salant, AIA, author of *The Brand New House Book* and the U.S. syndicated *Your New Home* column. Homes will demand “user-friendly flexibility and minimal wire runs,” she says. “And it is essential that it be installed by qualified integrators.”

Cologne, Germany Architect Uwe Bernd Friedemann knows firsthand the value of integrating technology experts into design architecture planning. He recently completed a three-and-a-half-year design of a private home with intelligent electricity technology. The six-story historic villa, which he redesigned internally to a minimalist aesthetic, is completely computerized, so that someone can open the door to the ground floor swimming pool from the sixth floor. It also features comprehensive lighting, security and sound systems.

“It was a very exciting project for me, and it involved very good communication with a team of specialists,” Friedemann says. “The client wanted a fully automated house. My job is an architect, and from a design and aesthetic point of view, I don’t want to see the workings of technology. It must be invisible. So I work with different specialists in

acoustics, lighting and wiring to achieve this. I learned to design by hand; technology is another medium for me,” he says.

PLANNING FOR THE INVISIBLE

While teamwork may count as the most crucial component to designing with smart technology, planning is the most challenging. Goetz believes flexibility is key and stresses the importance of not designing so specifically for technology that it cannot be adaptable. Because technology is changing so rapidly,

designers need to be able to forecast as much as possible and allow for that flexibility.

“We’re in a period of huge transition,” says Richard Derbyshire, Principal of international technology consulting company Shen Milsom and Wilke in Arlington, Va. “For years, the audio/visual industry has been an analogue world. Today it’s switching to digital faster and faster. That means that specialty cable that was the hallmark of the audio/visual industry is becoming less significant. Digital platforms

have many different solution sets and many are incompatible with one another and use incompatible cabling,” he says.

“Making sure we have flexibility in pathways to support additions and changes is critical,” Chapman says. “Everyone needs to understand the value and need for new technology and plan for it as early as possible in the design process.”

Getting advice early is a key issue for designers and homeowners. “It is most important to insure that pathways for cabling are provided for initial

What’s to Come

They may seem like ‘sci-fi’ innovations now, but in 10 years, these examples of smart technology are likely to be commonplace.

- Appliances embedded with wireless technology that enables them to ‘talk to each other’ — and to their manufacturers — so that mechanical problems can be diagnosed from afar.
- A refrigerator that can scan its own contents, deliver a grocery list to your retailer and have new supplies delivered to your home.
- A bathtub that can monitor water temperature and turn off taps when the tub is filled.
- Multiple televisions, computers, home security systems and whole-house audio connected into one computerized system that also operates your lighting, air conditioning, heating and irrigation systems from one control box — and from the other side of the world via your laptop.
- A voice-controlled house that responds to your voice command to turn off lights and television sets throughout the house.
- Walls that can change color with the press of a button via a pre-programmed computerized system.
- A fridge-oven combination that can be set to thaw food, pre-heat, cook and keep warm via your office’s computer.

construction installation but also for future changes in cabling technology,” Derbyshire says. “Establish a location where primary equipment would be located and use that location as the home-run destination for all equipment and appliance cabling located throughout the property.”

Though home builders and electricians appreciate the public’s desire for houses with better

How can designers find a qualified installer for a structured wiring network? “There are a few national firms that sell the equipment and train and certify installers, but Bell Atlantic Ready, a subsidiary of Bell Atlantic Communications, is as of yet, the only company that installs residential structured wiring networks on a large scale,” Salant says. Designers can find a complete list of design consultants and

“Everything else, including linking the computers or televisions can be added later, but adding the wires and outlets later will cost about four times as much as doing it during the initial construction when all the walls are open.”

Designers should also discuss with homeowners (before building begins) how they plan to use their rooms and exactly where they will



“It’s just a matter of time before smart technology goes from bleeding edge to leading edge to the average person.”

—Lewis Goetz, FIIDA, FAIA, Past President of IIDA, Group Goetz Architects, Washington, D.C.

communication capability, few have the expertise to deliver it. Most electricians are trained to install traditional electric wiring. “You need a person who is qualified in low-voltage electronics – the electronic category that includes telephones, cable television, security systems and home theater,” Salant says. “It is not sufficient, however, to be familiar with the installation of one or more of these systems. The integrator must have additional training to network all these systems together properly.”

certified installers through ICIA.org and the Custom Electronic Design and Installation Association (CEDIA). Sears, Best Buy and CompUSA – firms that sell the products that homeowners will be plugging into their structured networks – are also gearing up to provide qualified integrators.

Salant says the most important first step in setting up a structured wiring network is getting wires into the walls and the multi-media outlets (an outlet with jacks for phone, Internet access and cable) in the major rooms of the house.

want things like coffee makers and other appliances within the kitchen. They also need to study the builders’ electrical drawings which locate all the switches and outlets in the house. In most cases, planning ahead with an integrator saves owners the much higher cost of installation after the house is finished.

Salant believes interior designers also need to plan for changes in a home’s usage patterns. “The home office, for instance, is a very different place than 15 years ago,” she says. “The computer has taken over.



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—Katherine Salant, AIA, author, *The Brand New House Book*

Now the whole family wants to be on the Internet at the same time, in several different parts of the house. Designers have to think ahead to where clients want to use computers, sound systems and audio-visual equipment. Families are now much more likely to be gathered around televisions and computers than the fireplace, so we need to rethink not only the fireplace and wiring connections, but also window and furniture placement in relation to computer and television screens?”

GROWING PAINS

It’s one thing to plan for wiring when building a new house, but adapting an existing home is an entirely different process.

That’s the biggest challenge of all, Goetz says. “Going into an existing house and trying to retrofit it to new technology is very, very difficult – and expensive,” he says. “That’s why a lot of homes go to wireless technology; because it’s almost the only way to upgrade

without ripping walls out or having unsightly surface-mounted cable.”

But wireless technology entails its own challenges, first among them security. This is because coverage of wireless nodes overlaps several households. “If you go to professional equipment, you can reduce the signal strength and coverage area and thereby limit it to one household, or you can protect your network behind firewalls – but most people don’t,” Derbyshire says. “As wireless technologies multiply, the opportunity for someone to eavesdrop and monitor goes up exponentially. The question becomes, ‘What do you really need to safeguard?’ That’s what you treat separately.”

Cost and aesthetics are also huge issues in upgrading cable in an existing home. The important questions relate to access points for existing cabling, what can be reached and whether or not a homeowner opts for the expense of concealing new cabling. “The one question we all need to ask when we’re planning for technology

is: ‘Is there a way I can repeat this cable path in the future?’ The point of good cable management is planning for replacement. The importance is the cable pathway, not the cable itself. Today the standard is Cat 6 UTP cable, however that standard has changed twice in the last 10 years. As there is no way to predict future cable with certainty, it is more important to secure a repeatable cable pathway to potential device locations,” Derbyshire says.

“If someone is redoing the kitchen or living spaces in an older home, they’ll be taking out dry walls anyway, so adding extra wiring for the future is no different,” Salant says. “Budgeting thousands of dollars for communication systems in your new home may seem excessive, especially if it means postponing luxuries such as the *Corian*[®] counter tops in the kitchen. But waiting to do this after your house is finished will cost three times as much.” 📧