Throughout the nineteenth and twentieth centuries, as the mechanical and electrical systems of buildings became increasingly elaborate and sophisticated, they demanded growing shares of design attention.

INTELLIGENT INTERIORS

The activity that converts

The activity that converts a merely *networked* building into an *intelligent* building is the integration of electronic sensors, robotic effectors, and control intelligence into the network so that the building can respond more effectively to changing interior requirements and external conditions. This is becoming increasingly feasible as the cost of microelectronics drops, as electronic intelligence is embedded in a widening array of devices, and as these devices are networked.

Electronic sensors correspond to the eyes, ears, and other sensory organs of living organisms. Computer-connected microphones and digital cameras (particularly in the form of increasingly ubiquitous Webcams) are the most obvious. Pressure sensors not only make keyboards possible, they can also be embedded in flooring and furniture to track locations of furniture and inhabitants. Position sensors range from the mechanical and optical sensors of the PC mouse to ultrasonic and electromagnetic sensors that precisely track coordinates of objects in three-dimensional space, to Global Positioning System (GPS)-based sensors that track automobiles, boats, and airplanes. Motion sensors tell whether there is activity within a space. Electronic and optical tags and badges, together with special readers, allow objects to be identified. Climatic sensors can keep track of temperature, humidity, and air movement. Specialized chemical sensors exist in vast variety. And medical sensors–implants, bedside devices, and noninvasive sensors in the surrounding environment–can monitor your bodily condition.

Robotic effectors are machines that have been networked and brought under computer control; they correspond to the hands, feet, and other organisms that living organisms employ to accomplish their goals. Computer-controlled displays, printers, and audio output devices have, of course, become very familiar. Less obviously, any household device may now be thought of as a potential robotic effector. Lighting, heating and ventilating, water and sewage, cleaning, and security and safety systems of buildings may also be integrated with networks. So may actuators that operate doors, windows, and blinds or other privacy and sun-control devices. And there are innumerable specialized devices such as computer-aided design and manufacturing (CAD/CAM) production machines and surgical robots.