# IS YOUR BUILDING

The great outdoors. It's something most often experienced...through a window. In fact, today we're spending anywhere from 80 to 90 percent of our day inside. If that number sounds a bit high to you, just think about where you've spent most of *your* time today. For that matter, think about where you spend most of your time, period.

As the world continues to urbanize, our buildings—and our attitude toward them—must evolve. We can no longer afford to think of our offices, airports, stadiums and shopping malls as inert edifices, disconnected from what's going on inside them. Doing so wastes money, resources and opportunity.
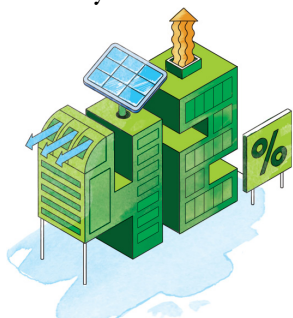
*42 percent of the world's electricity is used by buildings.*

BRICK, MORTAR, DATA.

Today, a rush of data and analytic insight is helping buildings get smarter. Turning them from static structures into ever-evolving, data-generating ecosystems— ones that sense their surrounding environment, maintain their own upkeep and adapt to the needs of their inhabitants.

This is beyond green. Beyond efficiency, even. More than simply optimizing individual systems like heating and lighting (though they do that, too), smarter buildings have systems designed to communicate with each other and with their environment.

So a building can use excess heat from its data center to warm its warehouse. Turn collected rain into nonpotable water for plumbing. Connect with a city's operations centers. Even optimize all systems across a company's multiple buildings.

Now that data and analytics have changed what a building can do, leaders are changing the notion of what a building can be. They see that instrumented, inter-connected, intelligent buildings
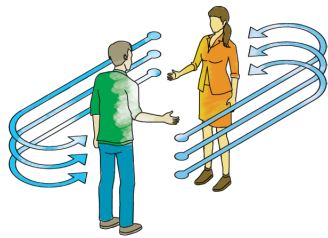
Some studies estimate that investing in new building systems can increase productivity by up to 14 percent.

not only save money and resources, but can also work *for* a building's inhabitants, its owners and its city.

PUTTING BUILDINGS TO WORK.

Working with IBM, the operators of Sun Life Stadium—home to the Miami Dolphins—implemented sensors and connected systems in the building to give the 70,000-plus crowd an optimal experience.

temperature monitors and its own management system, the building monitors itself. So now it can tell managers how it can be most efficiently operated with regard to heating, cooling, humidity controls, ventilation and more. Now architecture students—those who will soon shape the world's buildings—get a firsthand look at

"Buildings should serve people, not the other way around."
— John Portman, architect

TRYING TO TELL YOU SOMETHING?

So now, integrated analytics technology throughout the stadium offers immediate insights into stadium operations, including visitor traffic, weather patterns, fan spending performance and even social media sentiment— allowing the stadium's operators to predict events and adjust accordingly in real time. So, for example, managers can predict bottlenecks at the parking lot, ticket gates and concession stands and alert fans via text messages to take alternate routes.

At Tulane University's School of Architecture in New Orleans, IBM helped transform century-old Richardson Memorial Hall into a living laboratory. By collecting, combining and analyzing real-time data from sensored equipment,
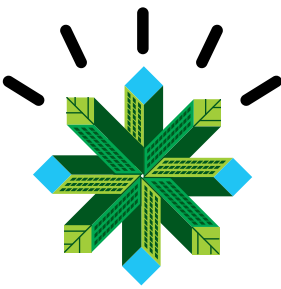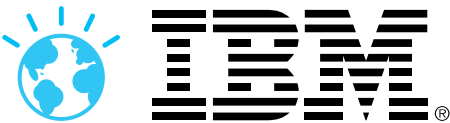
how a structure's systems affect those within the building and the resources it consumes. Students also see how historic buildings can be adapted for efficiency and how systems can work together, even across multiple buildings, for optimal performance.

At The Cloisters, the medieval branch of New York City's Metropolitan Museum of Art, centuries-old works lie vulnerable to even the smallest environmental changes. So the museum monitors weather, indoor temperature, humidity, contamination levels, light, foot traffic, airflow, door positions and more—all in real time. With this information, conservators and engineers can

optimize environmental parameters for long-term preservation.

And at IBM's own Rochester, Minnesota, facility—a 50-year-old campus of 35 buildings—facilities engineers have dramatically improved operational efficiency.

By collecting data from across the network and continuously analyzing and measuring it against operational standards, the staff can now better determine the optimal time to service and repair assets—a holistic, proactive approach to maintenance that not only saves energy and money, but allows engineers to fix problems
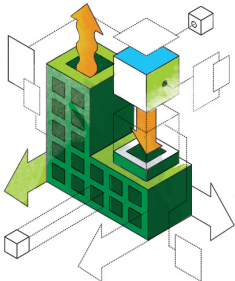
IBM cut annual energy costs for monitored assets by up to 15%.

before anyone knows they exist. In fact, IBM saw up to a 15 percent reduction in annual energy costs for monitored assets after installing analytics capabilities.

GIVE ME MORE THAN SHELTER.

Buildings affect their inhabitants: one study shows proper ventilation can increase work performance and lower "sick building syndrome" symptoms by up to 19 percent.

Buildings affect their environment: 42 percent of the world's electricity is used by buildings. In the United States it's as high as 70 percent.

The more time we spend indoors, the more we realize that buildings must be so much more than roofs over our heads. Our buildings shape us. So we must continue to shape *them* with intelligence. ibm.com/smarterbuildings

LET'S BUILD A SMARTER PLANET.