

*"I'd be a bum in the street with a tin cup if the markets were always efficient." - Warren Buffett*

## Five Building Inefficiencies that are Business Opportunities

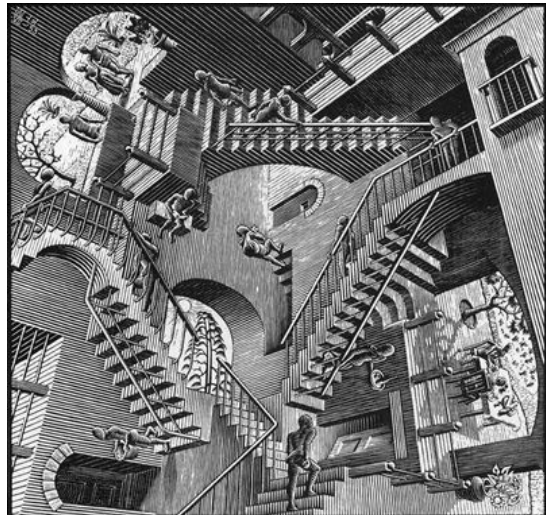
By

Jim Sinopoli, PE, LEED AP, RCDD

Managing Principal, Smart Buildings LLC

Some see inefficiencies as problems, which they are; others see them as opportunities as well. In Warren Buffett's case, he's looking for an inefficient market that has undervalued a company or its underlying assets. If markets were always efficient everything would be valued correctly and Mr. Buffett wouldn't find those good deals.

For those of us involved in the design, construction and operation of buildings, inefficiencies are issues as well as opportunities. Inefficiencies are opportunities if we can provide efficiency and therefore value to a process or business. Businesses, especially those involved in building technology systems, will start-up and grow based on their capability to provide efficiencies to building owners. Nowhere is there a better example than the massive initiatives on energy conservation, which at its core are a response to our inefficiencies in the way we generate, supply and consume power.



The question for buildings and in particular building systems then is "Are there inefficiencies in the design, construction and operation of our buildings?" I would guess you know the answer to that. Almost 10 years ago an article in the Economist magazine suggested 30% waste in US construction projects. Five years ago the US National Institute of Science and Technology estimated the lack of interoperability in the construction industry was costing around \$16 billion per year. Other studies show a decrease in productivity in the industry compared to increases in most other economic sectors. So in an industry that some characterize as legacy, decreasing in productivity, wasteful and somewhat dysfunctional, what are the "pockets" of inefficiencies where solutions would bring value? Where is it that our businesses and ideas can grow and thrive with the right products and services? What follows are five areas that are now "ripe":

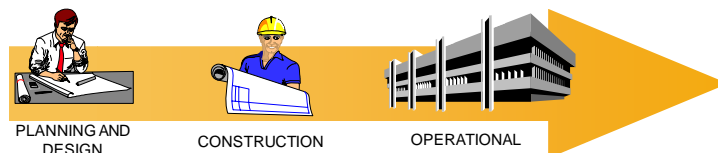
1. **The woeful lack of sensing, metering and monitoring of a building's performance.** – Can you actually manage anything without having information or data? How many building owners are currently "managing" energy by only

comparing this month's utility bill to last month's? How granular and time sensitive is that?

Our vision should be that buildings will be equipped with meaningful technology; walls and ceilings will be embedded with sensors, every aspect of a building's performance and use will be metered and measured, real-time information on the building will be provided to occupants and building management relevant to their particular needs, buildings will be fully interactive with the power grid, and geo-spatial location systems will be deployed to track every building asset. Products and services that can transform raw sensor and consumption data into actionable information for building owners will succeed.

2. **The inefficiencies and ineffectiveness in transferring data from the design and construction processes into a facility management system** – How is data and information that is created or obtained during the design and construction process handed off to building operations? Most of it is still paper handed over in three-ring binders and boxes, maybe CDs of drawings and specifications too. Lost in this handoff is data and information that could improve the management and operation of the building.

Building Information Modeling (BIM) is very promising in addressing this issue but for those owners or designers who haven't adopted BIM yet, the operation is hindered by having information in a paper format that can't easily be ingested by a facility management system. How many facility managers have the time or budget to re-enter data into a FMS? The previously mentioned NIST study that concludes that \$16 billion was wasted every year due to lack of interoperability



was essentially about the exchange of data (or lack of) between all the parties involved in the design, construction and operation of a building. Designers and

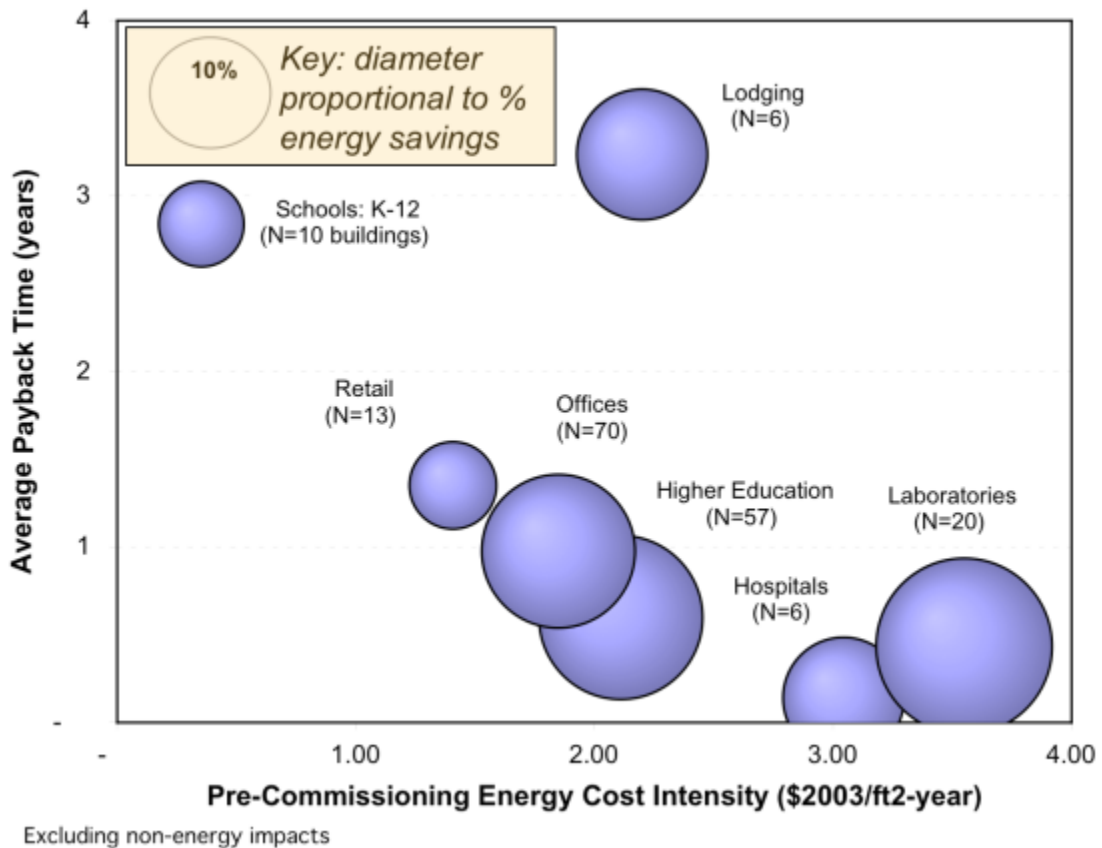
contractors need to change their deliverables and documentation for easy use by building operations. There is a market demand to maximize the data and information created during design and construction for the betterment of building operations. Again, products and services that can facilitate collaboration between all parties involved and provide the owner with solid data and information for building management will succeed.

3. **The ineffectiveness of most space planning** – Studies have shown that office buildings occupied by service-sector companies are oftentimes less than 50 percent occupied. That's right; on a typical day half of the people are mobile, absent or working at home and are not in the building. Exacerbating the situation in the short term is the state of the economy which has shed jobs, and in the long term, the advancement of mobile, office and home technology. What we're doing

now is primarily providing space for the most improbable case when every employee is showing up for work in the office and in turn, wasting operating and/or capital cost on empty office space.

Space planning is very critical to employee productivity and company expenses. Products and services that balance technology, space costs and employee productivity will thrive. Better utilization of space, flexibility in space use, systems that can provide HVAC and lighting aligned with office occupancy and can blend office workers, stay-at-home-workers and mobile workers in a cohesive and collaborative entity have a bright future.

- The sub-optimal operation of building systems** – A 2004 study sponsored by the DOE concluded that the median payback time for recommissioning an existing commercial office building is 0.7 years. Quick, name one other activity that has a payback period that short. With a 0.7 year payback period does it make any sense to do recommissioning every 2 or 3 years? As the chart demonstrates, some energy intensive building types, such as hospitals and laboratories have almost immediate payback. We need automated, continuous commissioning. That means a transition to intelligent commissioning software tools that can be used to automatically optimize building systems without human intervention. Any products or services providing this can hit the sweet spot.



5. **The lack of building system integration** – If the various systems in a building are not integrated, the building owner/manager is not getting all the functionality they could out of the systems. The adage: “The whole is greater than the sum of its parts” applies to integrated systems. It means that integrating the system provides functionality that doesn’t exist with separate systems. A number of case studies demonstrate the value of integrated building systems, which is primarily lowering capital and operating costs. The integration of building systems is just one piece of a much larger industry-wide effort to integrate and collaborate. Organizations such as the AIA and the National Institute of Building Science’s initiative with the Whole Building Design Guide are supporting integrated project teams, an integrated design approach and collaboration between designers, contractors and owners. Technology, economics and the move to energy efficiency are driving integrated systems and the successful firms will embrace the concept and grow with it.

For more information about smart buildings, technology design or to schedule a Continuing Education program, email [jsinopoli@smart-buildings.com](mailto:jsinopoli@smart-buildings.com) .