SMART BUILDINGS

BOOST PORTFOLIO VALUE

Deep Thoughts by Deepinder Singh: Part 6

A series on the future of cloud computing, big data and buildings

SMART BUILDINGS OFFER NET GAINS

The commercial real estate (CRE) market is rich with opportunities for smart buildings to improve property management top- and bottom-line performance through expense reduction, increased property values and better workplace experiences for tenants.

Today, amid the flurry of smart homes, self-driving cars and smart wearable devices, only about 15% of commercial buildings are "smart," with connected building automation systems in place[1]. But, that's about to change BIG TIME. In fact, the CRE market is projected to have the fastest and largest growth in connected devices between 2016 and 2021, surpassing even smart homes, according to the Smart Building Research firm Memoori[2].

SMART BUILDINGS CAN SAVE UP TO *50%* ON HVAC AND LIGHTING ENERGY COSTS[3]

Legacy building controls systems are overbuilt and expensive for most commercial building owners and operators. Those systems are being displaced by new, born-digital solutions.

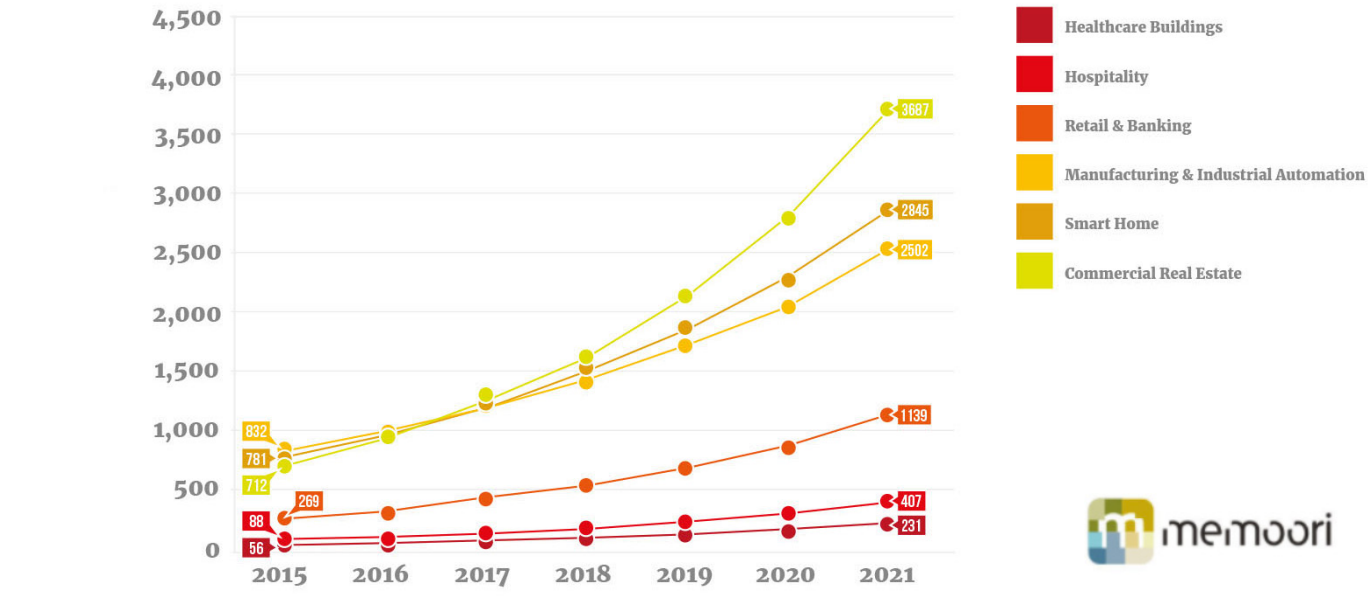
Fueled by the proliferation of affordable sensors and cloud computing, this new breed of building intelligence solutions is changing-up the economics of the real estate investment world. Now, it's more affordable and easier than ever to realize net gains from the affordable, yet sophisticated, building automation systems (BAS) that combine the Internet of Things (IoT), wireless communications, big data and cloud-based algorithms to make your buildings smarter, more efficient and more attractive for both current and potential tenants.

These new systems offer several ways to both reduce expenses and improve property values, netting positive for all real estate stakeholders - investors, owners, asset managers, brokers, property managers and, of course, tenants- the ultimate customers.

When you factor utility incentives for energy-efficient systems, or just the annual operational savings, building automation systems are becoming a smarter choice for property CAM, TI and upgrades on financial merits alone, before factoring the many workplace benefits.

Perhaps the greatest value in smart buildings is in the improved workplace experience, with comfortable, healthy, productive and easily-managed indoor environments for tenants. An intelligent building system can play a key role in attracting, retaining and delighting tenants, offering lower energy bills, eco-friendly offices, and creating great places to work with healthy indoor air quality and unique occupant experiences (OX).

GROWTH IN SMART BUILDING CONNECTED DEVICES OVER TIME (millions of devices)



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EXPENSES GOING DOWN

OpEx Reduction Reduce operating expenses across building systems, including HVAC and lighting maintenance.

Energy Savings A Smart Building system can save 30-50% of HVAC energy consumption, plus reduce LED and other lighting energy – conservatively $.20-.50 PSF.

Rebates Utility-driven efficiency incentives can reduce total cost of acquisition and speed ROI timeframe.

Reduced HVAC Equipment Higher efficiency means fewer or downsized equipment, or even eliminating traditional fixtures.

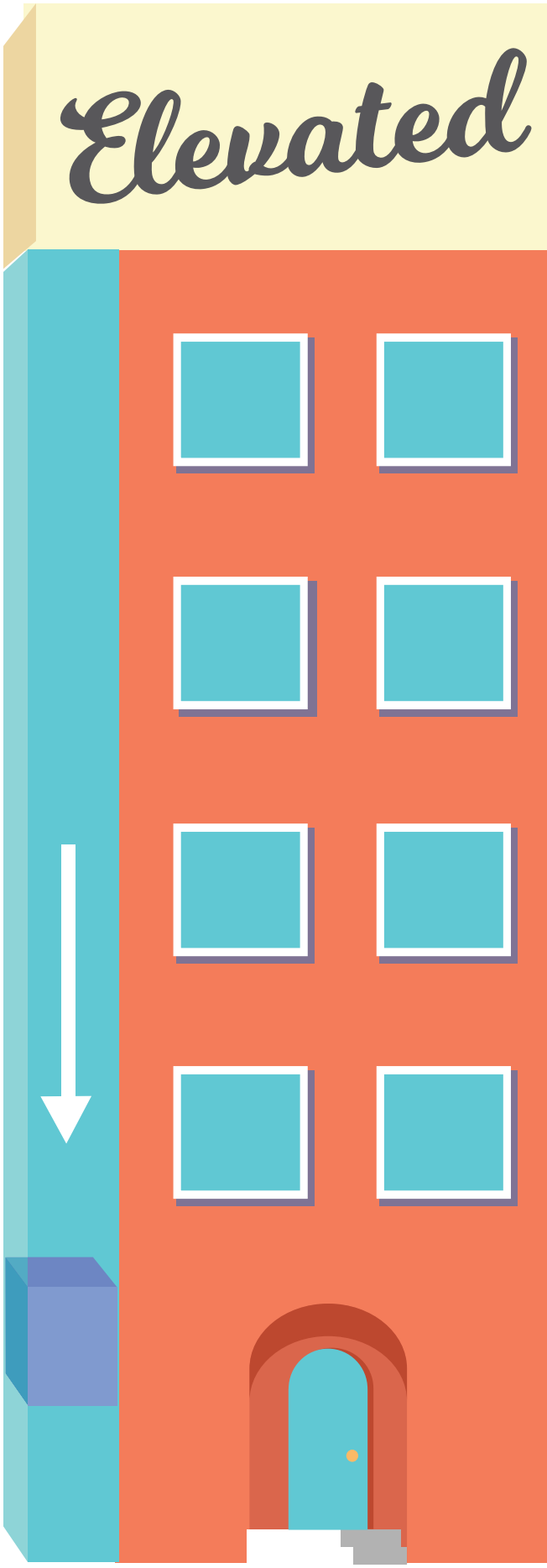
Extend Equipment Life Retrofit controls to equipment; smart monitoring and predictive maintenance can add years to your equipment lifecycle.

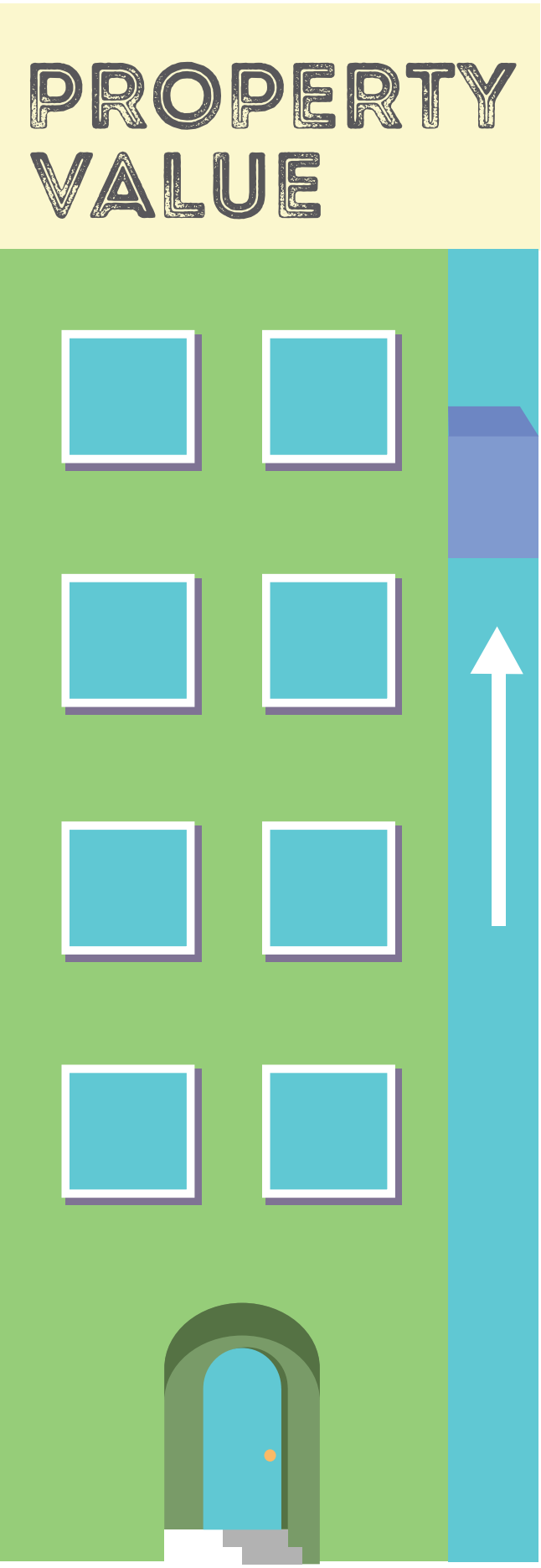
No IT Hardware Costs No need to invest in workstations and software updates; cloud based software enhancements pushed wirelessly.

Lower Installation Costs Get 5x faster installation of wireless system, eliminate temperature controls specialists and custom programming.

Remote Multi-site Management Web and mobile monitoring and adjustments without site visits; reducing travel expenses and team disruption.

Optimization Through Insights Further efficiencies can be driven by data insights, patterns understanding demand and supply / performance.





VALUE GOING UP

Higher Rates per Square Smart building systems can lift property value by at least $.10/sf, increasing as much as 11.8%, adding to your topline.

Long term Hold Assets 10+ year plans; internal rate of return.

Differentiation Only 15% of commercial buildings are smart. Yet, progressive tenants seek and value the benefits and controls of smart, connected properties.

Staged for the Market A smart automation system shows well. A quick retrofit to your curent and vacant properties provide a fast enhancement. When showing, use a Google calendar feed or geofencing based pre-conditioning to make that first visit comfortable and inviting.

Attract + Retain Tenants Smart systems, and applications that empower the users, are becoming a means to get interest from prospective tenants and to stay sticky with existing clients.

Creating the "Occupant Experience" is a huge opportunity for landlords to give management remote insights, save energy, improve workplace IAQ and comfort, plus empower employees with control over their zones.

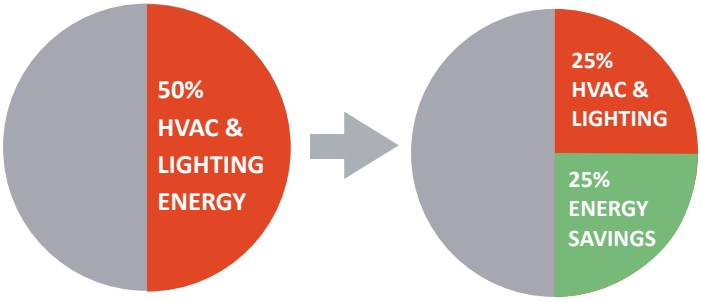
Higher Return TI Investment Adding more-lasting and differentiated value than fresh paint and carpet.

Higher Return CAM Investments Can offer uncommon value for common areas and budget management.

Green Value in Sustainability Green buildings have ever-increasing attention and value in the market, supporting corporate citizenship and triple-bottom line performance for profit, people and the planet too.

DECREASING EXPENSES

The U.S. Green Building Council cites that buildings consume 70% of the U.S. electricity and account for 39% of U.S. CO_2 emissions. The U.S. Department of Energy (DOE) indicates that commercial buildings waste 30% of the energy they consume. This is a major opportunity for smart buildings efficiency to save significant energy expenses and reduce environmental impact; yet, that's just the start of the savings.



Smart building controls can reduce HVAC and Lighting energy consumption by up to 50%.

STARTING TODAY, SMART SOLUTIONS CAN CUT ENERGY BY 25%

One of the greatest and most immediate opportunities to reduce property operational costs is in energy reduction, particularly in more efficient management of heating, venting and air conditioning (HVAC) and lighting. In the average commercial building, HVAC and lighting makes up about 50% of energy use[5]; so, the potential of 30-50% energy savings from smart HVAC could translate to 25% of total energy use. That alone is worth the investment, often with payback in less than 3 years, sometimes less than a year. And that's just the start of savings. Smart building technologies can reduce costs and add value to your TI packages, while boosting returns for owners and tenants alike.

SAVINGS SCENARIO

AGING URBAN CLASS B OFFICE: 100,000 SQ. FT.

For a 100,000 sq. ft. building of mixed use office space, a smart and efficient HVAC system could conservatively save .20-.50 per square, or **$20-50k** in annual savings.

SPACE HEATING DEMANDED THE MOST OVERALL ENERGY USE IN COMMERCIAL BUILDINGS IN 2017, FOLLOWED BY OTHER USES

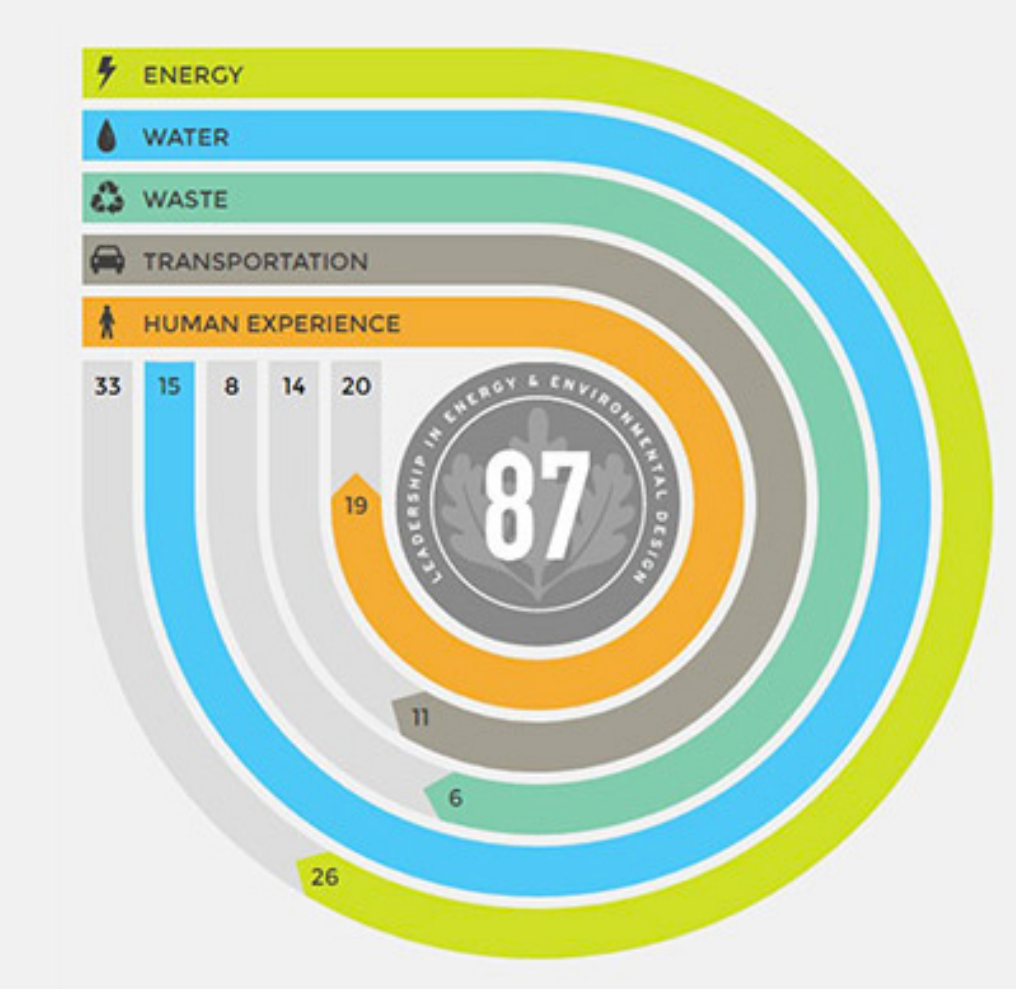
EFFICIENCY INCENTIVES PAY GREEN FOR GREEN EFFORTS

Utility-driven rebates, low- or no-rate financing and tax incentives for energy efficient systems help cover costs and reduce payback timing, leading to net gains even sooner. A quick, no-cost site survey and estimated projection of energy savings can help to cost-justify the building automation system investment and define the payback timeframe, from only an energy savings perspective.

LEED CREDITS INCREASE SAVINGS (AND INCREASE PROPERTY VALUE)

The US Green Building Council's LEED program recognizes Leadership in Energy and Environmental Design, with different levels of reward: LEED-certified buildings (40-49 credits), silver (50-59 credits), gold (60-79 credits) and platinum (80+ credits). LEED buildings have faster lease-up rates, may qualify for a host of incentives like tax rebates and zoning allowances, and retain higher property values[6].

For example, 75F intelligent building solutions can contribute to up to 38 different LEED v4.0 points, up to 11 credits. This provides even further capability for you to demonstrate sustainability and good corporate citizenship, in addition to eligibility for financial incentives, such as tax credits. And, new measurement tools such as USGB's Arc Score can help you assess your ongoing building performance benchmarked against others, whether you're a LEED building or not. The Arc score offers dynamic measures for Energy, Water, Waste, Transportation and Human Experience.



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EQUIPMENT SAVINGS (CapEx)

The total cost of acquisition (TCA) can be significantly reduced with an energy efficient and easily installed IoT-based building automation solution. Building management systems are historically expensive and overbuilt, prohibiting adoption by the 85% of buildings that don't have them in place. Though, newer BAS alternatives with low-cost sensors, no specialized programming, and quick/easy setup can reduce the cost and time to implement.

Lower-cost Systems: Affordable sensors and wireless devices are making IoT-based BAS a cost-effective solution for commercial buildings of all sizes, at a fraction of traditional system costs.

Reduce Installation and Controls Costs: The speed and ease of installation for wireless and intuitive BAS systems can be 80% lower than traditional systems, making for quick retrofits with minimal occupant disruption.

Require Less HVAC Capacity and Equipment: A building automation system's overall efficiency can also reduce the number and size of HVAC equipment (such as RTUs) required to meet demands, reducing capital expenditures when new HVAC equipment is needed.

Extend the Life of Equipment: And a smart building automation system can add years to the lifecycle before needing to upgrade HVAC equipment, stretching your CapEx dollar even further.

Lower IT Compute Costs: A cloud-based system eliminates the need to buy dedicated servers or workstations and the related maintenance of physical IT compute and forced upgrades over time.

EQUIPMENT SERVICE SAVINGS (OpEx)

Utility and repair/maintenance expenses remain two largest operating expense categories for commercial buildings. An intelligent building automation system can start saving in ongoing operational expenses (OpEx) that make up the Total Cost of Ownership (TCO) for a building automation system. The O&M Best Practices Guide[7] from the U.S. Department of Energy (DOE) outlines significant savings opportunities:

- Reduce maintenance costs up to 30%
- Replace parts only when actual performance degradation requires it, vs. a calendar schedule
- Eliminate 70% to 75% of equipment breakdowns
- Reduce equipment downtime 35% to 45%
- Remote monitoring also minimizes the need for expensive truck rolls to start diagnostics, which can run from hundreds to thousands of dollars, depending on facility and service provider.

It is also useful to consider that, according to the DOE[8], operations and predictive maintenance can realize the same benefits (energy savings) as equipment retrofits costing approximately 20x more.

Beyond energy savings, smart HVAC controls can reduce the number/capacity of new equipment, lower install costs, plus extend the life and reduce maintenance costs of existing equipment, retrofit across multiple brands and system types.

SMART BUILDINGS BENEFIT EVERYONE

Owners and Investors can gain up to 25x increased property value for OpEx reductions, adding quick and affordable differentiated building amenities that attract and retain tenants and help stage for sale. Plus, their building feature performance-optimized equipment, with lower TCA and TCO.

A&E and Developers, whether in new build or renovation, smart building systems offer opportunities for reduced equipment (due to efficiency), minimal wiring (wireless communications) greater environmental design control.

Asset Managers managing physical property assets can get a lot smarter, with data visualization on lowered expenses and high value per square, across the portfolio.

Brokers benefit from attractive and differentiated smart properties which improve marketability, showing well, offering energy savings, engaging prospective tenants and facilitating speedy sales.

Property Managers gain cross-portfolio monitoring and management (RMM) capabilities, down to the building, floor, zone and individual equipment performance level.

Facility Managers get RMM, the ability to coordinate repairs, minimize emergency truck rolls, and deliver smarter service and maintenance based upon insights.

Mechanical Services can deliver quicker installation and configuration, without programming or on involving controls specialists, staying competitive and in control.

Tenant Executives & HR Professionals offer great places to work, in addition to energy savings, comfortable workspace, reduced absences and turnover, healthy and productive employees, and a stronger employment brand.

Tenant Occupants get comfortable, healthy environments catered to their preferences, plus smart tools to control temperature and lighting right from their mobile phone.

INCREASING VALUE

DRIVE NET OPERATING REVENUE

Smart Buildings attract and retain tenants. This helps to reduce vacancy and increase lease revenue. And, it can help you boost your lease cost per square foot. Together, these factors can start adding value to your property assets, in addition to the multiple capital and operational cost savings identified.

Fill Vacancy

Vacancies are a double-edged sword, cutting into operating costs to maintain, while spending to market listings to prospective tenants – all without a revenue stream. A smart building can help attract and convert tenants to reduce vacancies.

11.8% RENTAL VALUES

Increase Lease Value per Square Foot

A smart building is a more attractive building. In addition to the energy savings and sustainability benefits, a connected building can yield higher rates per square foot – conservatively adding $.10/ per. Studies have indicated that high-performance buildings can increase the rental values as much as 11.8% for commercial buildings[9].

Smart LEED Buildings Increase Lease-Up Rates and Property Values

In addition to financial incentives, LEED buildings have faster lease-up rate and retain higher property values[10].

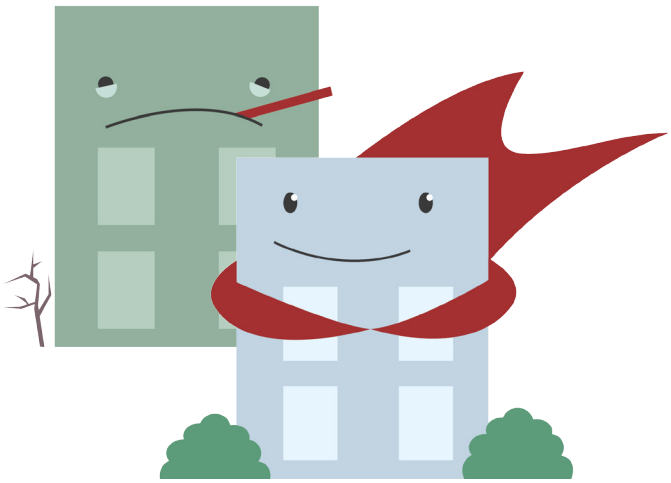
Sustainable Buildings Support Corporate Values

More businesses recognize green business is good business, and their values and corporate citizenship efforts are integral to their brand. A smart and sustainable building adds value for management, while also delivering financial benefits.

CREATING THE IDEAL OCCUPANT EXPERIENCE

Employee Empowerment & Personalization

Employees increasingly seek workplace environments that cater to them. Deloitte's "The Edge" in Amsterdam, hailed as the most connected and greenest building, attracts and serves employees with mobile apps to guide to the best parking spots and building areas to support their working style, requirements and preferences. You can even empower occupants with mobile apps to control temperatures and lighting in their own zones. Advanced BAS solutions can capture occupant feedback and deliver employee controls, environments and experiences that significantly affect comfort, productivity, health and overall satisfaction.



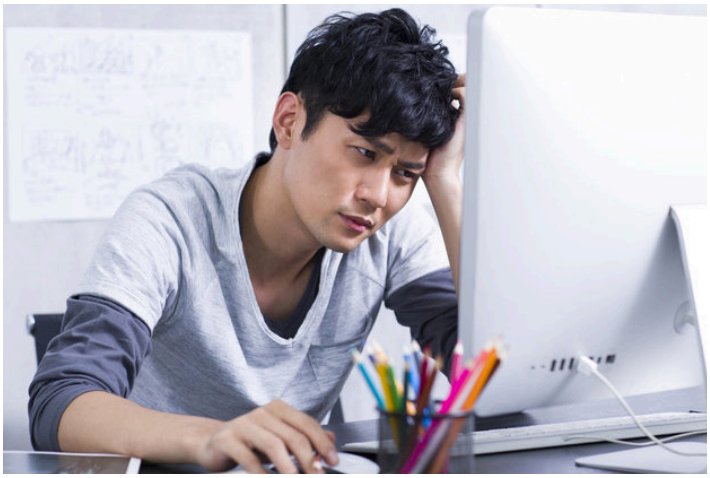
Health & Wellness - Well Building vs. Sick Building

Occupant health and wellness are paramount concerns for everyone involved in commercial environments. "Sick building syndrome" threatens the health of occupants can cause absenteeism; it can result from a host of contributors, including building materials, high concentrations of

chemicals or machinery, presence of asbestos or radon, old carpet, dirty air ducts, or a poorly designed or inefficient HVAC system. Smart buildings can sense and manage many of these factors to assure a healthy environment for all occupants.

Indoor Air Quality

Indoor air quality is likely to be 2-5x worse than outdoor air quality. Given that most of us spend 90% of our time indoors, your building's indoor air quality can significantly affect employee and customer health, comfort and productivity. Better air quality means employees take 30% fewer short-term leaves[11].



Cognitive Ability

Improved indoor air quality can also boost employee productivity up to 8% in your facility, and can improve cognitive functioning by 61%. The healthy Buildings program at the Harvard T.H. Chan School of Public Health has conducted the COGfx study has quantified and confirmed the negative effects of poor indoor air quality – namely high CO2 and VOC levels – on human cognitive abilities.

Comfort & Productivity

Smart buildings can sense and proactively manage the environments for key factors in employee comfort and productivity:

- Thermal Comfort
- Air Quality
- Lighting
- Sound

WHAT'S IN A SQUARE FOOT?

This 2/20/200 model presents a broad rule of thumb for relative investments in energy, rent and staffing. While a smart building system can pay for itself in less than 3 years on energy savings alone, the much larger values area in the enhanced value of the property for lease or sale purposes, and even greater value for the comfort, health and productivity of the tenants of the building.

$2 PSF/yr on Energy
Avg. annual energy expenditure. A smart building could reduce energy consumption 25% and pay for itself in under 3 years.

$20 PSF/yr on Building
Avg. annual building related costs. A smart building can help to reduce OpEx and increase lease value.

$200 PSF/yr on People
Annual investment in people. A smart building can help to boost comfort and productivity.

ROI

A 1-3 YEAR ENERGY PAYBACK IS JUST THE START

You can use the simple payback formula, as long as you have your current average utility payment per period and a quote for the estimated energy savings your building will achieve with the retrofit.

$$P = Vi / S$$

P = payback period
Vi = initial value of investment
S = estimated annual savings

These numbers can also help you calculate net present value (NPV), internal rate of return (IRR) and the impact on your net operating income (NOI). Energy savings free up additional investable dollars for other building improvement or tenant improvement projects.

BOOSTING VALUE IN THE BALANCE

EXPENSE REDUCTIONS	ASSET VALUE INCREASE
Energy	Lease Value PSF
Maintenance & Repairs	Tenant Attraction / Lower Vacancy Rate
HVAC Equipment Acquisition + Installation	Tenant Retention / Satisfaction
Onsite IT Equipment	Data & Insights Across Properties
HR: Employee Turnover & Training	Sustainability
	TI + CAM value

OPEX REDUCTIONS HAVE MULTIPLIER EFFECT ON ASSET VALUE

Property investors can recognize asset valuation increases of up to 25x for operational expense reductions, assuming a 4% capital rate.

FASTER PAYBACK THAN LED LIGHTING PLUS MORE EFFICIENT LIGHTING

In recent years, LED Lighting retrofits have been a popular approach to reduce energy demand at the fixture level. However, smart HVAC solutions can offer even higher efficiency and ROI compared to LED. Consider that the typical payback period on relamping is about six years, whereas the typical payback period on a smart HVAC system upgrade is about three years.

And, a smart lighting controls solution can take your LED lighting savings even further, with calendar scheduling combined sensors for light-level and occupancy to use lighting only when needed, and dimming capabilities. SmartBuilding systems can seamlessly integrate controls of both HVAC and lighting, in a single-pane-of-glass user interface.

SMART BUILDING BUDGET OPTIONS

Smart Buildings make for smart investments in cost savings and value enhancements, often with ROI in under 3 years. And, you may be surprised how affordable and easy a modern building automation solution can be.

ASSESSMENTS AND ENERGY INCENTIVES

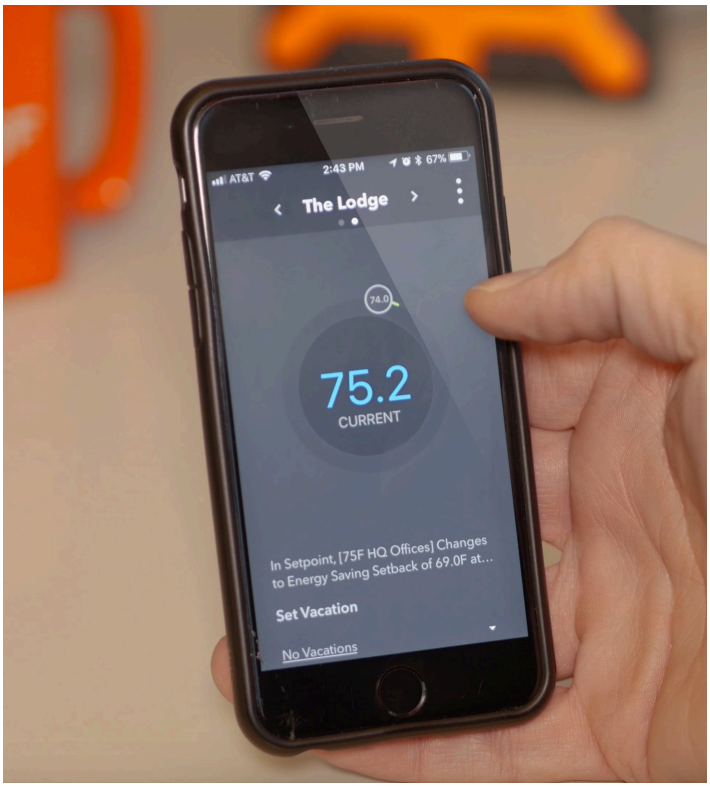
An initial assessment of your existing property can quickly identify the equipment and installation costs, as well as determine eligibility for energy efficiency incentives and financing. Just starting with a review of utility bills by an energy consultant can go a long way toward identifying budget source for a BAS.

CAM BUDGETING OPTIONS

A surplus of CAM funds gives property managers and asset managers options to attract new tenants and retain valuable tenants with building improvement activities. Consider that CAM can be used for capital expenditures. Building improvements are generally accepted if they reduce the property's operational costs, lead to reduced CAM charges and benefit all tenants. Whether your property is under a triple net (NNN) lease or a gross lease structure, upgrading your building's HVAC system falls into these parameters nicely, and it doesn't have to break the bank.

TI BUDGETING OPTIONS

Strategic capital planning and innovative TI packages are attractive to tenants seeking renovated office space in prime locations, going way beyond paint and carpet upgrades. Tenants across industries see that they can get more value and customization opportunities in both CBD and suburban Class B buildings. Occupants benefit not only from reduced energy expenses, but also from the combination of comfort, improved indoor air quality and precise lighting controls – all factors that can boost employee productivity. And, 75F offers an occupant mobile app that empowers tenants to personalize zone-specific temperatures and lighting. Combining all of these benefits increases net operating income (NOI), which can improve investor returns and create capital for investment in additional projects. According to JLL Research, tenant improvement packages range from $30 to $50 per square foot nationwide. At less than $5 per square foot, a smart BAS optimizes the use of IoT, cloud computing and machine learning.



75F offers a user app which allows tenants to personalize zone-specific temperature settings.

Increased Indoor Air Quality

Healthier Employees, Reduced Absenteeism

Increase in Productivity

WHICH PROPERTIES STAND TO GAIN THE MOST?

AT THE GET GO: A NEW APPROACH FOR A NEW BUILD

A smart building automation system can save up to 50% vs typical new controls acquisition and installation costs, due to modern, low-cost sensors, the speed of intuitive and wireless system setup, and cloud computing eliminating the need for onsite IT equipment. And, you can gain sensing and insights around your occupancy, indoor air quality, energy use patterns, equipment performance and more.

Higher efficiency automation controls can reduce the required capacity of HVAC equipment in a new build design. One company was able to reduce the number and capacity of HVAC equipment, saving $150k for a new 115,000 sf office-warehouse property.

QUICK RETROFITS FOR FAST RETURNS

AGING CLASS A

Aging Class A properties need to compete with the sprawling development of new premium Class A buildings and the resulting rise in vacancy in the category.

You already have the premium location and fixtures, though the HVAC and lighting systems may be nearing end-of-life; a smart automation system can help extend the life of this equipment and improve its efficiency, plus provide preventative monitoring capabilities for more efficient property management and controls for tenants too.

One of the greatest values you could add is actually invisible: comfortable temperatures, high indoor air quality,

a better occupant experience, plus improved efficiency and management capabilities. With high-demand tenants, you can shift from a measure of your response time to a position where you predict and pre-empt issues, so those issues never even surface in the first place.

AGING CLASS B

Aging Class B buildings while typically well maintained, have great benefits from a smart building solution, which can serve as an investment opportunity and upgrade booster for stronger lease rates.

Whether equipped with aging Rooftop Units or boilers and heat pumps, retrofit building automation solutions can bring a new level of value to the property to attract or retain tenants with state-of-the-art sensing and controls, comfortable and healthy indoor air, and remote monitoring and maintenance efficiencies.

"ONE OF THE GREATEST VALUES YOU COULD ADD IS ACTUALLY INVISIBLE: COMFORTABLE TEMPERATURES, HIGH INDOOR AIR QUALITY, AND A BETTER OCCUPANT EXPERIENCE."

AGING CLASS C

Class C properties have a lot to gain from smart sensing and controls automation, which can quickly and easily be installed during renovation, including TI and CAM investments. Remote monitoring provides added insight across properties, including predictive analysis of equipment performance.

GET IT TOGETHER FOR MULTI-SITE & MULTI-SYSTEM

Whether you manage a portfolio of 1000's of properties or a handful of select sites, the remote monitoring and management capabilities of smart building systems give you single-pane-of-glass visibility and control from your Web browser or mobile phone – down to the building, floor, zone and equipment levels.

No need to be onsite to have insight.

Consider the hard costs and opportunity costs for travel to sites or ordering service truck rolls to manually assess facility performance and issues. With remote monitoring and control capabilities, you can sense and see early signals of issues in your facilities and even plan predictive maintenance, sending truck rolls only when needed….and equipped with knowledge and parts for an efficient visit.

Even a Frankenstein mix of properties and systems can be beautifully managed.

You likely have a mix of building profiles in your portfolio. And within any one location, you may have a combination of HVAC systems installed, including different topologies, brands and models. Until now, you were forced to work within silos of these systems, or you faced an expensive and resource-intensive investment to try to piece together these systems with custom programming and specialist involvement. Today, you can retrofit sensors and controllers within that Frankenstein mix of systems and get a beautifully integrated view of current status, energy use, zone and equipment drill-downs and more. What's more, you can add efficiencies and extend the lifespan of aging HVAC equipment, reducing OpEx and deferring capital equipment investments.

MARKET TIMING

When's the best time to install a smart building automation system?

The short answer is now. Start with a quick assessment and a low-risk trial installation, which can be accomplished for less than a typical audit. And, start realizing immediate energy savings and benefits for your tenant and your efficient property management that can scale on your schedule. Timing in the fiscal year and the lease status can also create great opportunities for an intelligent building automation investment:

- TI
- CAM surplus
- Vacancy Opportunities
- And, new tax regulations may make an even stronger case.

Vacancy is an open window of opportunity.

A vacant property presents a great time to install a building controls upgrade without tenant disruption, creating a welcoming and comfortable climate, adding remote visibility and timing for benchmarking energy use and performance.

A NEW ERA OF SMART BUILDINGS IS HERE

Commercial properties will become the smartest, most-connected buildings in the Internet of Things ecosystem over the next few years. Will your buildings offer the smarts and performance as high-value assets delivering strong returns, while creating ideal conditions to attract and delight your tenants? Smart buildings cut expenses in energy, maintenance and other areas, making for a straightforward payback timeframe. Though the improved experiences for owners, property manager and occupants alike will offer the greatest value and returns.

ABOUT THE AUTHOR

Deepinder Singh founded *75F* in 2012 after he designed some of the world's fastest core networks for Tier 1 service providers like *AT&T, NTT* and *Verizon.* With almost 25 years experience in electronics and computing, he's brought a wealth of embedded products to the market. His key goal in every endeavor is to simplify operational complexity and make products intuitive.

That's why he created 75F, an intelligent building solution that utilizes the Internet of Things and the latest in cloud computing to create systems that predict, monitor and manage the needs of light commercial buildings.

TAKE A CLOSER LOOK

Request a free analysis and consultation for your properties.

GET A FREE ROI CALCULATION

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