



THE VALUE OF CLEAN

HOW CLEANING IMPROVES YOUR BOTTOM LINE





The Value of Cleaning

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Executive Summary

The purpose of this ISSA white paper is to provide insights to facility decision makers in a way that enables them to fully understand, evaluate, and justify their investments in cleaning in ways they currently may not be considering.

Historically, cleaning has been viewed by facility managers and building owners as a cost center. Consequently, decisions about cleaning expenditures have been one-dimensional and focused on the amount spent to clean the facility. However, review of the studies and empirical data reveals that cleaning activities impact a business's bottom line in numerous ways and that developing a deeper understanding of cleaning's economic benefits will produce greater savings.

Analysis of the data strongly supports the position that cleaning is economically efficient and, thus, a relatively modest investment in cleaning produces substantial returns. Using this information, facility managers will be able to make better decisions that leverage the money spent on cleaning to improve the bottom line.

Although there are many different ways to generate cost savings through cleaning activities, this white paper focuses on the following categories:

1. Work ticket resolution costs
2. Occupant wellness: absenteeism
3. Occupant wellness: improved productivity
4. Image enhancement: customer satisfaction
5. Asset preservation
6. Energy savings
7. Reducing hospital associated infections (HAI)

ISSA selected the foregoing because they generate the greatest return on investment (ROI) and most clearly demonstrate the value of cleaning.

ISSA reached out to and collaborated with industry stakeholders for documentation, scientific studies, and research data. Additional studies and papers in the public domain were also reviewed to determine the impact that cleaning would have on overall cost of facility management and occupant wellness.

This white paper is accompanied by a software application and a PowerPoint presentation that are free to ISSA members. The software application allows users to input their data and calculate the ROI. In addition, ISSA offers members a video and customizable customer leave-behind cards that are available at issa.com/value.

Industry Overview

Economic Impact

The janitorial service industry (SIC 7349/NAICS 561720) is part of the \$33 billion facility services industry (*United States Economic Census, 2007*). It is one of the largest and most dynamic service industries in the world. There are more than 2.3 million service workers (*Bureau of Labor Statistics, U.S. Department of Labor, 2012*) and in excess of more than 53,000 building service contractors in the United States that provide cleaning services to a variety of building types (*United States Economic Census, 2007*).

The U.S. Energy Information Administration Commercial Buildings Energy Consumption Survey counted more than 4.9 million commercial buildings in the United States with more than 71.6 billion square feet of floor space (*Energy Information Administration, 2003*).

Service Providers

Cleaning firms have the opportunity to provide services to a wide range of clients. At one end of the spectrum are commercial facilities such as office buildings, high-rise office complexes, distribution facilities, food processing plants, hospitals, nursing homes, airport and mass transit terminals, government offices, and industrial plants.

In addition to the contracted service sector, many universities, K-12 schools, healthcare, hospitality, manufacturing, and other industries employ their own cleaning staffs.

The industry's breadth and high degree of fragmentation are driven by relatively low barriers to entry and only minimal differentiation. Consequently, janitorial services have been largely cost driven. This cost-centered focus has led many contractors to cut corners in order to remain competitive. The result is inconsistent service. Facility decision makers have responded by using two approaches in tandem to deliver quality services in a cost-effective manner: Quality Standards and The Value of Cleaning.

Quality Standards¹

The ISSA Cleaning Industry Management Standard (CIMS) and CIMS-Green Building

¹ In 2006, ISSA convened technical committees comprised of industry experts from different disciplines to develop the framework for quality management principles for cleaning organizations. The result of their efforts is the Cleaning Industry Management Standard (CIMS). CIMS applies to management, operations, performance systems, and processes. A free copy of the standard, organizational checklist, contract requirement wording, a list of certified firms and ISSA Certification Experts (I.C.E.) can be downloaded at www.issa.com/cims (ISSA, 2009).

(CIMS-GB) criteria and certification program provide a powerful tool that can be used to measure the quality of a cleaning organization's management structure, cleaning operations and green cleaning services. The Standard sets forth the processes, procedures, and supporting documentation proven to be characteristic of customer-driven organizations. CIMS and CIMS-GB are divided into six areas of management best practices:

1. Quality systems
2. Service delivery
3. Human resources
4. Health, safety, and environmental stewardship
5. Management commitment
6. Green Building (for CIMS-GB)

The Value of Cleaning

With the increased focus on sustainability and public health protection, progressive firms are adopting a more holistic approach to cleaning. They have learned that cleaning impacts a wide array of business functions and that relatively small incremental investments in cleaning produce outsized gains for the organization. This white paper identifies the business activities that cleaning impacts and quantifies the returns that cleaning investments produce.

Work Ticket Resolution

In 1979, Phillip Crosby published his first business book, *Quality Is Free* (Crosby, 1979). This quality management book would become popular at the time because of the crisis in North American manufacturing quality. One of the key principles of his book was DIRFT: “Doing It Right the First Time.” During the late 1970s and into the 1980s, North American manufacturers were losing market share to Japanese products largely due to the superior quality of the Japanese manufactured goods.

The premise of Crosby’s work was that every product or service has a requirement: a description of what the customer needs. When a particular product or service meets that requirement, it has, by definition, achieved quality. Crosby estimated that poor quality can cost an organization 30 percent of revenue. He believed that quality management should include the following: quality planning, quality assurance, quality control, statistical gathering, and systems that place quality in its proper context.

Similarly, cleaning requires completing a series of tasks in multiple areas. As such, even a relatively small facility requires successfully completing literally hundreds of individual tasks. Thus, it is easy to see how errors can quickly mount up. Poor cleaning manifests itself in numerous corrective service requests. These service failures impose costs on both the customer and service provider.

It should also be noted that reductions in the scope of work typically produce corresponding increases in the number of work tickets generated. Ironically, the savings obtained by reducing the scope of work are often eclipsed by the costs of resolving service issues.

Service Provider Costs

Service failures are costly for service providers because additional labor is required to correct each deficiency. In addition, each failure involves not only a response, but also a customer interaction that consumes management resources to resolve the cleaning deficiency; the cost to correct the issue goes beyond the work ticket resolution cost. For example, the cost of refinishing a floor may double if not performed correctly or if there is damage to the substrate. Floor replacement costs can be in the thousands of dollars. The true savings associated with quality cleaning operations is the investment in reduced operating costs, asset preservation, and client satisfaction.

Customer Costs (Cost per Work Ticket)

Cost per Work Ticket (CPT) is a very effective metric to “monetize” the impact of an investment in quality cleaning operations. Cost per Ticket is obtained by dividing the total annual operating expense by the annual number of tickets handled. Operating

expense includes all employee salaries, overtime pay, benefits, incentive compensation, time, and miscellaneous expenses required to address complaints about cleaning.

The cost of resolving an issue includes the cost to receive added work requests resulting from insufficient cleaning, time/cost to create a ticket, time/cost to schedule rework or remediate the situation, time/cost to complete the added task, time/cost to assess the rework to ensure satisfaction, and time/cost to communicate completion to the occupant originating the request.

While actual work ticket resolution costs vary from organization to organization, the costs are analogous to those required to process an invoice. According to the Institute for Supply Management (*ISM, 2004*), Aberdeen Group (*Aberdeen, 2004*) and Profit Planning Group (*Bates, 2010*), invoice processing costs may range anywhere from \$13-49 each. This includes the cost of labor and multiple steps in order processing, order placement, management approval, and vendor interaction.

An average Cost per Ticket can be developed using the average of all work tickets over a representative period of time. It also can be segmented into specific work ticket activities for more detailed analysis of improvement when investing in a certain cleaning function, increased frequency in a specific facility area type, or changes in cleaning tactics.

Absenteeism

One of the many benefits of a clean facility is the reduction of harmful contaminants in the indoor environment. A clean and hygienic facility gives building occupants a visual comfort level and reduces potential risks that may be associated with buildings that are not as clean. Although there are many studies that address improved indoor air quality and the risks associated with dust and bacteria on surfaces, few have demonstrated how health risks due to inadequate cleaning impact building occupant personnel costs and, ultimately, a business’s bottom line.

The research that follows addresses the connection between cleaning and the spread of illness, which manifests itself in employee lost work days (absenteeism). Absenteeism is a substantial cost to businesses that can be reduced through proper cleaning practices.

An Absent Management Study was conducted in 2011 by Chartered Institute of Personnel and Development (CIPD) (*The Chartered Institute of Personnel and Development, 2011*). CIPD is an internationally recognized company with more than 135,000 members across 120 countries. It is one of the world's largest human resource organizations.

The CIPD study gathered data from 592 organizations across the UK, employing more than 2 million employees. The study documented the average days of absenteeism per employee in a variety of work settings, along with their estimated costs to employers. The average sick days per employee per year were 7.7 days (Table 1). CIPD determined the average cost of absences to be £673 (\$869 USD) per employee per year. Illnesses such as colds, flu, stomach upsets, and headaches were the most common cause of short-term absences.

Table 1: Average Level of Employee Absence, All Employees²

	Average working time lost per year (%)			Average number of days lost per employee per year		
	Mean	Standard Deviation	5% Trimmed Mean	Mean	Standard Deviation	5% Trimmed Mean
2011: All Employees	3.8	3.5	3.4	8.7	8	7.7*
2010: All Employees	3.4	1.9	3.2	7.7*	4.3	7.4

Base: 403 (2011); 429 (2010)

² A 5 percent trimmed mean was used because the large standard deviation shows there is high variation across organizations, with some reporting extremely high levels of absence. In 2010 the arithmetic mean was used because the standard deviation was within acceptable limits, showing less variation in the absences reported by organizations. Table 1 includes the mean and 5 percent trimmed mean for reference.

A study published in the *Journal of Occupational Environmental Medicine* in 2003 reported that, based on a random sample of 28,902 United States workers, health-related lost productive time (LPT) costs employers \$225.8 billion per year, or \$1,685 per employee per year (*Stewart, 2003*).

That study calculated absenteeism as the sum of hours per week absent from work for a health-related reason. Cost impact is estimated by multiplying lost productive time (absence hours plus hours lost from reduced performance) by the individual worker's hourly labor cost. This is the recommended method of calculating the basic impact of absenteeism and its cost to the organization.

Hidden Costs of Absenteeism

While some organizations may track worker absenteeism, thus providing preliminary data useful in connecting cleaning impact on personnel costs, they may be missing all the absenteeism costs involved.

A 2008 survey conducted by Mercer/Marsh (*Kronos Consulting & Mercer, LLC., 2008*) identified the hidden costs of absenteeism. The survey found that, in addition to the payroll cost of the absent employee, organizations must hire temporary labor or offer overtime to cover the absent employee's responsibilities and that the "hidden costs" should be factored into absenteeism calculations. To do so, multiply the additional hourly costs by the number of hours incurred and add this figure to the absent employee's direct costs.

The survey also revealed that many employers fail to account for the 36 percent in administrative expenses that it takes to manage absence benefits. This includes tracking, reviewing, and processing the absence by company staff. Once that cost is determined, often as an annual percentage, it can be evenly divided by the total number of employees to determine the average per employee. It then is added to the average direct and indirect labor costs above, per employee.

Still more impact was revealed by the Mercer/Marsh survey: the disruption in the labor supply affects productivity, even with replacement staff. This could lead to lost sales, late delivery of goods/services, customer dissatisfaction and loss of revenue. Respondents to the survey reported that unplanned absences caused a 54 percent decrease in productivity/output and a 39 percent drop in sales/customer service. If an organization can estimate these additional costs, the annual average cost of lost revenue per employee then would be increased.

Healthy Workplace Study

Often, organizations that track absenteeism are missing the quantifiable connection between cleaning activity and spread of illness in their facility. But in doing so, they underestimate the human resources savings of proper cleaning. In 2010, Kimberly-Clark Professional* launched The Healthy Workplace Project*³ (HWP) in North America and by the end of 2012, HWP was in more than 30 countries. The program uses a combination of techniques to affect behavior and attitude changes in employees. The project's premise is that if property owners and managers can motivate building occupants to adopt better hygiene habits, they could break the chain of germ transmission, resulting in cleaner buildings and promoting a healthier work environment. In fact, the program's Wash, Wipe, Sanitize protocol has demonstrated that it can reduce the probability of infection for common cold and influenza by approximately 80 percent and can reduce the number of surfaces contaminated with viruses by 62 percent. The program also can reduce absenteeism by as much as 46 percent.

The project's research team used ATP (adenosine triphosphate) monitoring to demonstrate cleanliness improvements by comparing the level of soil and contaminants present before and after implementing the protocol⁴. The team collected thousands of ATP samples from offices and developed a substantial knowledge base of the locations and nature of office contamination hot spots.

Table 2, on page 9, furnished by ATP luminometer provider Hygiena, correlates ATP readings with levels of cleanliness.

³ The Healthy Workplace Project* is a trademark of Kimberly-Clark Worldwide, Inc.

⁴ ATP is the universal energy molecule found in all animal, plant, bacteria, yeast, and mold cells. Residues, particularly food or organic residues, contain large amounts of ATP. When left on a surface, residues can harbor and grow bacteria, cause cross-contamination, develop biofilm and lead to many other problems that can compromise quality. After proper cleaning, all sources of ATP should be significantly reduced. Multiple brands of ATP luminometers are available for use in such testing.

Table 2: Hygiene ATP Levels of Cleanliness⁵

Hygiene ATP Levels of Clean	Relative Light Units (RLU)
Ultra Clean Sterile surfaces and food preparation areas	0-10
Very Clean Critical touch points	11-30
Good Clean Floor requirement and typical microfiber performance	31-80
Somewhat Dirty Caution: Surface should be cleaned and has some risk of contamination from disease-causing bacteria	81-200
Dirty Warning: Surface needs cleaning and has medium risk of contamination from disease-causing bacteria	201-500
Very Dirty Danger: Surface needs cleaning and has a medium to high risk of contamination from disease-causing bacteria	501-1,000
Filthy Danger: Surface needs cleaning and has a high risk of contamination from disease-causing bacteria	>1,000

The research team found in their monitoring that the percentage of office surfaces tested and found to have high levels of contamination (an ATP count of 300 or higher), includes:

- 75 percent of break room sink faucet handles;
- 48 percent of microwave door handles;
- 27 percent of keyboards;
- 26 percent of refrigerator door handles;
- 23 percent of water fountain buttons; and
- 21 percent of vending machine buttons.

⁵ Kimberly-Clark used a Hygiene ATP luminometer to measure ATP. When ATP is brought into contact with Hygiene’s luciferin reagent in the Ultrasnap surface-testing device, light is emitted in direct proportion to the amount of ATP present. The system measures the amount of light generated in relative light units (RLUs) and provides information on the level of contamination in just seconds. The higher the RLU reading, the higher the level of contamination present. ATP hygiene monitoring provides accurate and traceable verification of the hygienic status of a surface.

In addition, half of all computer mice and desk phones tested were found to have ATP levels between 100 and 300. After implementation of the protocol, the levels decreased an average of 62 percent, providing significant improvement in overall workplace cleanliness.

To demonstrate the program could break the chain of transmission of germs, the research team engaged Dr. Charles Gerba of the University of Arizona to carry out a study to quantify the reduction of exposure of viruses after the introduction of a hygiene intervention.

The study was conducted in a hundred-person office, where a person and a surface were contaminated with a surrogate virus at the beginning of the day. After 4 hours, numerous commonly touched surfaces and people's hands were tested for the virus, and transmission was determined. The same test was conducted after introducing the project's educate and engage protocol, and targeted hand and surface hygiene products.

The results demonstrated that if these viruses were placed on either the hand of one individual or on a common encountered surface like a door handle, up to half or more of the hands or surfaces in the office were contaminated within four hours. This illustrates how important a contaminated object or hand can be in the spread of a virus in an office environment.

After the hygiene intervention, there was a statistically significant reduction in the concentration of the virus on hands and surfaces, which in turn, greatly reduced the spread of the virus in the office. Mathematical modeling indicated that the probability of infection by the common cold, flu and other viruses among office employees was reduced by 80 percent. This was achieved with only half (52 percent) of the office employees participating in the intervention.

Additionally, ATP samples collected at sites adjacent to the virus sampling indicated there was a significant correlation between ATP reduction and virus reduction on surfaces. This suggests that reduction ATP readings can be used to monitor the success of the protocol.

The program was designed to deliver measurable value to human resource departments, facility managers and other influencers that are responsible for office employees. The program can deliver the following outcomes:

- Cleaner buildings with more satisfied tenants, giving property managers an edge
 - Elevating the level of cleanliness in buildings without increasing annual
-

The Value of Cleaning

- cleaning costs of the existing cleaning contractor or in-house staff
- For Building Service Contractors, the ability to enhance client relationships by promoting workplace wellness
- Improved relations with employees who are concerned about cleanliness and personal hygiene
- A reduction in the probability of illness, which can positively impact the costs associated with worker absenteeism and presenteeism

Building Occupant Productivity - Presenteeism

Many organizations track the financial impact of absenteeism, the sum of hours absent from work for a health-related reason. But few businesses properly track the impact of "presenteeism" on businesses' bottom lines, another area impacted by cleanliness levels and their health implications. Presenteeism occurs when a worker feels compelled to come to work but is not fully functioning due to an illness. As a result, individual productivity can be reduced by at least one-third (*Hemp, 2004*). Unlike absenteeism, presenteeism appears to be a much costlier problem.

The *Harvard Business Review* documented this issue as one that companies face as they struggle to rein in health care costs. "We're talking about people hanging in there when they get sick and trying to figure out ways to carry on despite their symptoms," says Debra Lerner, a professor at Tufts University School of Medicine in Boston, who notes that presenteeism may be more common in tough economic times, when people are afraid of losing their jobs (*Hemp, 2004*).

Effects of Presenteeism

Presenteeism can have many negative effects on the workforce, including:

- Spending additional time on tasks
- Decreased quality of work
- Lack of initiative
- Lowered ability to perform at peak levels
- Decreased quantity of work completed
- Inability to be social with coworkers
- Lack of motivation
- Transmission of viruses/illness to coworkers/building occupants/patrons

Impact of Cleanliness on Presenteeism

In a study of 400 managers and employees conducted by HLW International LLP (*Buildings, 1999*), employees' productivity levels were determined to be heavily influenced by the cleanliness of the office in which they worked. More importantly, productivity of employees was not the only area impacted; employers who found it difficult to recruit prospective employees also were affected.

The study found that cleaning has a very real and measurable value, specifically reporting a 5 percent productivity gain (\$125,000) in a 100-associate office with an average salary of \$25,000. The study provides a formula that can be used to calculate a minimum cleaning-related productivity savings for an organization:

$$\frac{\text{Building Population}}{\text{Average Salary}} \times \frac{5\%}{\% \text{ Savings}} = \frac{\text{Value of Cleanliness}}{\text{Value of Cleanliness}}$$

A Minnesota Department of Health (MDH) (*Minnesota Department of Health, 2008*) report regarding the impact of cleanliness on student performance in educational facilities also supports the theory that the average productivity impact of proper cleaning can range from 2 percent to 8 percent.

The MHD report cites two separate office environment studies that found good housekeeping protocols that thoroughly removed dust from surfaces were found to have both health and comfort benefits. In the first study, building occupants who experienced mild symptoms of distress or discomfort (dry eyes, itchy or watery eyes, dry throat, lethargy, headaches, chest tightness) began to perceive a loss in performance ranging from three percent to eight percent, depending on the number of symptoms. In the second study, exposure to a reservoir of dust (an old carpet) affected subjects' typing, arithmetic, logical, reasoning, memory, and creative thinking skills by two percent to six percent.

According to a 10-month survey of more than 25,000 individuals conducted by Advance PCS Center for Work and Health (*Bureau of Labor Statistics, 2002*), off-task workers cost businesses an average of \$250 billion a year, or approximately \$2,000 per worker. The estimates were derived from their salaries and estimates of time spent at work engaged in reduced on-the-job performance because of illness. Cost impact was estimated by multiplying lost productive time (absence hours plus hours lost from reduced performance) by the individual worker's hourly labor cost.

Better management of employees' health, including a proper cleaning for health program, leads to improved productivity, which will create a competitive advantage in a hyper-competitive global economy. Improved cleaning practices, a comprehensive workplace hygiene program, high-performing cleaning products, and the deployment of quality management principles will impact the health and wellness of workers, and as data has correlated, improve the business's bottom line.

Image Enhancement - Customer Satisfaction

According to multiple studies, customers value cleanliness more than many other factors when deciding to do business with an establishment. The image that a clean facility creates is a lasting one. Many managers perceive cleaning as an operational cost, but a dirty facility with a poor image will cost businesses direct revenue. Dirty buildings can also create risks such as slips and falls, leading to higher insurance and legal costs. Consumers have many choices. When given the choice, consumers would rather do business with companies that are dedicated to a positive image and a clean facility.

The Cleanliness - Satisfaction Connection

In 2010 Procter & Gamble (P&G) conducted a cleanliness satisfaction study of the leading fast-food or quick serve restaurant (QSR) chains in the United States. Survey respondents identified cleanliness as the number one driver of customer satisfaction. Cleanliness was ranked higher than value, speed, convenience, variety, and accuracy of the order. When QSRs focus on cleanliness, they have a better chance to win market share.

More than 1,000 respondents between the ages of 18-64 were invited to participate in an online survey from a panel of more than 5 million Internet users. Age, gender, and ethnicity of the respondents reflected the respective distribution within the national population. P&G queried all respondents on their past 3-month usage of 28 QSR chains, their overall cleanliness satisfaction for each chain and whether there were any chains that they avoided due to cleanliness.

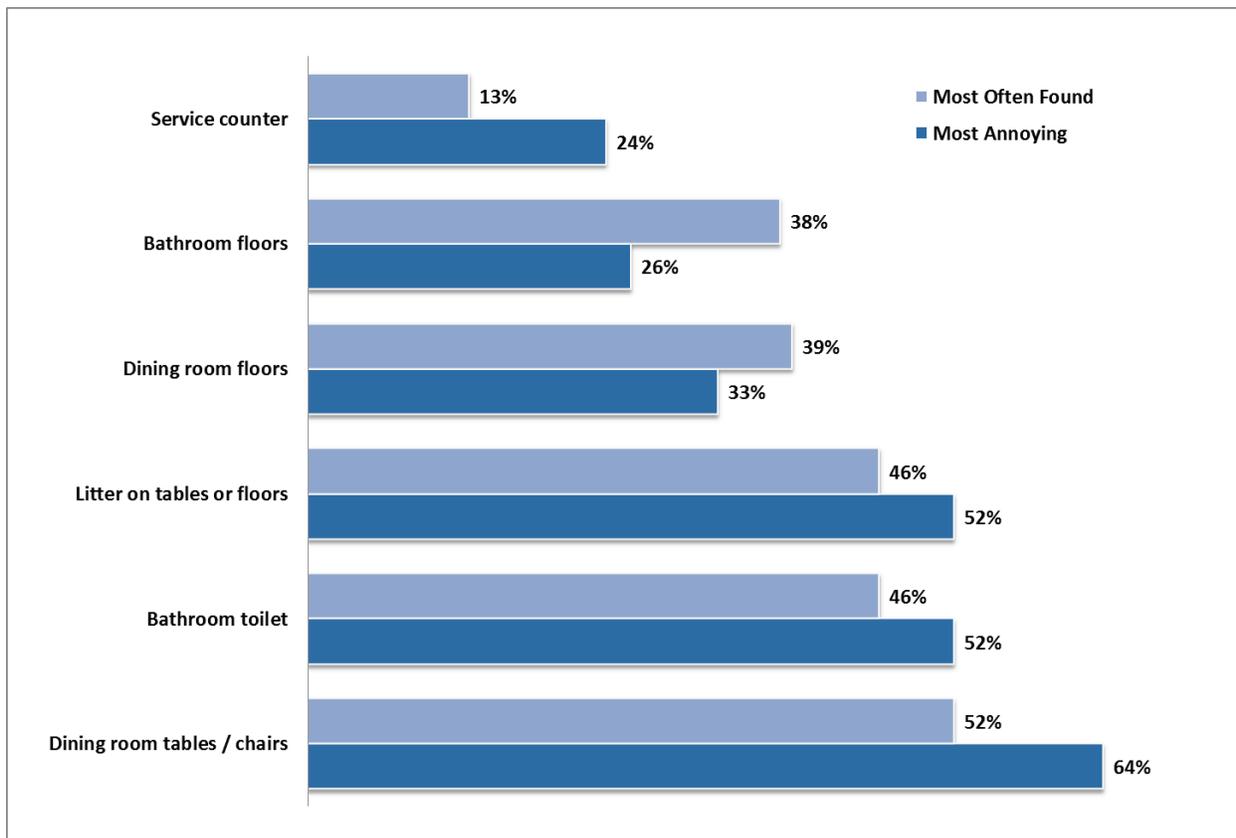
Out of twenty aspects of QSR cleanliness, respondents chose the four factors that most annoyed them and the four they found dirty most often. They were then given an opportunity to further define their most annoying cleanliness aspects. The top most annoying factors were the most common across all QSR chains.

- Restaurant cleanliness matters to QSR customers – *it is the most important attribute among the 15 customer satisfaction measurements*. More than 6 in 10 QSR users agreed that if a fast-food restaurant is really clean, they go there more often.
- Some aspects of QSR cleanliness that are “most annoying” to QSR customers are also found to be dirty most often: dining room tables & chairs, bathroom toilets, litter on tables and floors, and floors in the dining room and bathroom.
- In the dining room, sticky tables, chairs, and floors are the biggest obstacles to cleanliness.
- In the bathroom, unpleasant odors, clogged toilets, soiled floors, and sticky floors

are all issues for QSR users.

- Other aspects are often found dirty but are less annoying (perhaps because QSR customers have a lower expectation in these areas): condiment dispensers, garbage receptacles, and bathroom sinks.

Figure 1: Most Annoying Cleanliness Aspects Found Most Often in QSRs



Retail Store Image Enhancement

Chain Store Age, a magazine for retail executives, examined “store atmospherics,” the variety of elements retailers put into stores to make shopping more appealing. The results of the *Chain Store Age* survey revealed that customers view cleanliness as the most influential element of the shopping environment. Consumers rate cleanliness the most important by far among 13 aspects of store atmosphere. The magazine set out to answer a couple of key questions: What matters most to shoppers? How important are such basics as cleanliness and store temperature? To find out, *Chain Store Age* collaborated with Leo J. Shapiro and Associates to survey a national sample of 956 United States consumers age 16 or older. Respondents were divided equally between men and women. Households with children represented 35 percent of the sample (*Chain Store Age*, 2005).

Consumers segregate the elements of store atmospherics into three “tiers:”

1. The basic condition of the store, such as cleanliness;
2. Passive atmospherics, the essential but relatively static aspects of the store such as lighting and temperature;
3. Active atmospherics, the more interactive elements such as music, product demonstrations, and in-store TV.

Retailers who are able to orchestrate all three tiers in a deliberate, strategic way will create significant competitive advantage. In the shopper’s mind, atmosphere translates to well-being. “As retail becomes increasingly vanilla box-like, one of the most powerful differentiators is the well-being of the consumer in the store,” says George Rosenbaum, chairman of Leo J. Shapiro and Associates. His colleague, Ken Rice, adds, “Atmosphere is what creates that sense of well-being. Properly managing all the elements in the atmospherics repertoire has enormous competitive advantage, particularly in a self-service environment where the shopper has to work the store on her own.”

Furthermore, the tiers build on one another and are interrelated. If the store is not clean, it will receive little credit for passive characteristics. For example, better lighting reveals more dirt, and flooring and fixtures become unsightly. If the store falls short on passive criteria, it will receive little credit for active elements. Passive and active atmospherics can work at cross-purposes if active elements divert shoppers from making purchases.

The *Chain Store Age* survey found that store atmospherics as a whole (cleanliness, passive and active elements) are most important in food stores, ahead of nine other types of retailers in the study, including apparel stores, where cleaning ranks second in importance of store atmosphere.

Restroom Cleanliness Survey

A Harris Interactive Survey independent study conducted for Cintas Corporation further confirms the importance of cleanliness in customer choice selection from hospitality to healthcare experiences (*Cintas, 2011*). It discovered that 94 percent of 1,000 adults surveyed would avoid a business in the future if they encountered dirty restrooms. “Dirty restrooms cost businesses lost sales, customers, referrals, and repeat business,” said Mike Thompson, Senior Vice President, Cintas Facility Services. “This study reaffirms that if customers are not satisfied with the state of a restroom, they will take their business elsewhere” (*Cintas, 2011*).

Respondents were asked what specific types of businesses they would avoid if they

encountered dirty restrooms. Their responses are shown in Table 3.

Table 3: Adults Avoiding Business Because of Dirty Restrooms

Business Type	Percentage of Adults Avoiding Business Due to Dirty Restrooms
Restaurants	79 percent
Hotels	79 percent
Healthcare Facilities	77 percent
Supermarkets	50 percent
Retail Stores	45 percent
Gas Stations	45 percent
Car Dealerships	39 percent

Studies illustrate that levels of cleanliness are not just important to building occupants and their work productivity, but also factor into customer decision making, which can impact a business's ability to meet revenue expectations. It can be extrapolated that if a business has a formula for indicating revenue projections on a per-customer basis, the revenue impact of cleaning improvements can be calculated by factoring in a percentage of customers turned away due to undesirable building image and cleanliness. For example, if one in 20 customers is turned off by dirty restrooms, that is worth an estimated X dollars of lost revenue, which can be reduced to a more favorable ratio if cleaning improvements are implemented.

Asset Preservation

Asset Preservation: Carpeting

Buildings are financial assets that impact companies' balance sheets, making it worthwhile to preserve their value and reduce added maintenance or refurbishment costs. Cleaning plays a significant role in extending asset life cycles and increasing return on investment. Reduced cleaning to meet short-term operational budgets can actually result in a lower ROI as life cycles are shortened and more expensive replacements are needed to maintain building image, facility functionality and aforementioned customer satisfaction levels. Surfaces such as flooring, especially in high impression or high traffic areas, play a large role in asset preservation strategies.

It is widely acknowledged by the leading carpet mills, the Institute of Inspection Cleaning and Restoration Certification (IICRC) and the Carpet and Rug Institute (CRI) that a planned maintenance program extends a carpet's life. By increasing the annual cost of cleaning a carpet by 10 percent, a facility manager can extend the carpet's useful life well beyond the manufacturer's estimated life cycle, ultimately paying for itself in deferred replacement costs.

The formula to calculate life cycle cost encompasses more than the initial capital expenditure of the carpet (Equation 1).

Equation 1: Asset Life Cycle Cost Calculation Formula

$$\frac{\text{Cost of Carpet and Installation} + \text{Removal and Disposal Cost} + \text{Cost of Cleaning Over Carpet's Life}}{\text{Carpet Life in Years}} = \text{Life Cycle Cost per Year}$$

The Asset Life Cycle Cost Calculation Formula includes the following inputs:

- Initial cost of carpet: The price of carpet includes the cost of the carpet and installation.
- Removal and disposal cost: In a renovation, removing existing carpet and disposal cost should also be included along with additional costs such as work disruption due to renovations or area shut-downs.
- Cost of cleaning over the carpet's life: Cleaning costs include an estimate for time, labor, materials, and equipment repairs incurred by a facility while performing its routine program.
- Carpet life in years is determined by the number of years the carpet will be on the floor.

Studies have proven that properly maintained commercial carpets have enhanced appearance levels and extended durability. At many commercial sites with high foot traffic, a planned carpet maintenance program may extend the life cycle of carpet by two to three times over that of carpets that have unplanned or low frequencies of cleaning.

The Carpet and Rug Institute's (CRI) *Carpet Maintenance Guidelines for Commercial Applications* (Carpet & Rug Institute, 2012) along with the carpet manufacturer's maintenance recommendations are the best tools for evaluating whether an existing maintenance program is maximizing a carpet's life.

CRI describes carpet as having five levels of appearance: new, good, fair, poor and unacceptable (replacement needed). If a carpet's use-life is at least 10 years, having a good maintenance plan can lead to a carpet's appearance level as still being "good" in ten years. An unplanned maintenance program can result in a carpet's appearance level dropping to fair in 3-4 years, poor in 4-5 years, and replacement in 6-7 years. With neglected maintenance, new carpet can go from new to poor in as little as 1-3 years before replacement is necessary.

According to CRI, a customized comprehensive carpet care program consists of five elements:

1. Soil Containment – isolation of soil entering the building using mats at entrances
2. Vacuuming – scheduled frequency for removal of dry soil using a CRI-approved vacuum
3. Spot and Spill Removal System - using professional spot removal techniques
4. Interim Cleaning – scheduled frequency appearance cleaning for all traffic areas
5. Restorative Cleaning – scheduled frequency deep cleaning to remove residues and trapped soils.

CRI, IICRC and the leading carpet mills have established minimum cleaning frequency guidelines. Carpet mills publish cleaning guidebooks with recommended cleaning procedures and prescribed cleaning frequencies. These procedures and frequencies are based on traffic conditions and variables that may cause excessive wear.

Many carpet warranties are based on a documented carpet cleaning program that includes the four cornerstones of carpet maintenance: preventive, daily, interim, and restorative procedures. Property owners and facility managers should refer to warranty agreements and carpet mill recommendations to establish a cost-effective

carpet care program that will extend the life cycle of their investment.

One of the most important considerations when planning any cleaning program is its financial impact. Most carpet care programs have a strong ROI, and precisely determining the cost helps build a stronger business case. Calculating the annual cost of a carpet care program is straightforward. The ISSA Smart Staffing guidebook details the methodology of workloading, and InfoClean™⁶ provides easy-to-use software to calculate the annual cost of carpet cleaning to meet budget requirements (issa.com/workload).

Asset Preservation: Hard Surface Floors

Hard surface flooring presents a more complex calculation than carpet when evaluating the life cycle cost because of the wide variety of substrate types and ongoing innovations in flooring materials developed for commercial use. As part of the value engineering process, innovative architects and building owners calculate the annual cost of cleaning a surface and the impact that cleaning tasks may have on the floor's life cycle cost.

Commercial building installation trends in North America have favored ceramic and porcelain tile for the last 10 years. The Tile Council of North America performed an economic analysis of the life cycle costs of different floor surfaces by examining life expectancy, installation cost, material costs, and cost per sq. ft. per year for a range of flooring types (*Tile Council of North America, 2011*). The Tile Council concluded that ceramic tile has the lowest life cycle cost per square foot as a result of longer product life and lifetime maintenance costs.

They found the cost of cleaning ceramic tile can be significantly less than that of VCT (vinyl composition tile), sheet vinyl, or terrazzo surfaces. The most accurate way to determine the annual cleaning cost is to workload the floor care program. This can be performed by using ISSA's InfoClean™ software or other leading software programs on the market (issa.com/workload).

A side-by-side analysis of annual labor and product consumption gives building owners and managers the opportunity to select a flooring type that has the lowest annual cost of cleaning and may reduce any negative impact caused by restoration techniques. The cost of the cleaning program should always be factored into surface selection because it plays such a large role in the floor's life cycle savings. This is

⁶ InfoClean is a trademark of KnowledgeWorx, LLC.

especially important given the fact that many organizations select surfaces with manufacturer recommended maintenance factored into their life cycle estimates but don't coordinate with facility departments to ensure those estimates are feasible to carry out or to determine if other factors should be considered.

Energy Savings: Daytime Cleaning

Even the timing of when cleaning is conducted can have profit generation impact. There are numerous methodologies that can be used to schedule cleaning activities, and a multitude of factors need to be considered when setting up the cleaning plan. Daytime cleaning is one approach that has produced energy savings at some locations.

In 1997, General Motors Worldwide Facilities Group faced an increasingly competitive landscape and the need to reduce costs while maintaining quality. They began exploring the benefits and challenges of moving the night custodial crew to cleaning during the day.

The team reviewed schedules, potential interruption, tasks, labor, and productivity. They also considered occupant perspectives and disturbances to facility tenants. Energy consumption also was a consideration as the project began to unfold. After analyzing all of the data, they presented a case for daytime cleaning that included best practices and a way to perform cleaning during the day.

Steve Spencer, Facilities Specialist at State Farm, reviewed GM's work several years later and built on their practical experience. During the decade since GM's initial work, energy costs had risen steadily. Steve quantified the substantial energy savings that daytime cleaning could deliver. He found that daytime cleaning produced energy savings of between 7 and 8 percent per year in the 30 State Farm buildings that were transitioned to daytime cleaning.

EPA Region 8 Headquarters

The Environmental Protection Agency Region 8 Headquarters in Denver employs a daytime custodial service that schedules service from 8:00 a.m. – 5:00 p.m. each workday. As a result, the 292,000 sq. ft. facility is able to turn off lights and HVAC requirements between 6:00 p.m. and 6:00 a.m. Energy costs have been reduced by 28 percent, saving the building owner nearly \$250,000 annually.

Daytime Cleaning at University of Washington

Gene Woodward, Director of Facilities Services Custodial Division at University of Washington, also researched daytime cleaning and deployed it using an in-house cleaning operation on a large campus with more than 280 custodians (*Zudonyi, 2012*).

Table 4 summarizes the impact that moving to daytime cleaning produced. Service levels improved as measured by APPA scores and assurance scores. The productivity rate per hour increased with less worker fatigue, resulting in a reduction in staff from 315 full-time equivalent employees (FTE) to 282 FTE. Cleaning worker absenteeism also fell.

In addition to the many benefits of daytime cleaning, The University of Washington discovered that the campus reduced their carbon footprint by reducing fuel consumed by employees because more than 40 percent of the custodial staff now van-pooled to work, an option not available during the night shift. This also freed up valuable campus parking spots and gave the custodial staff additional income as gasoline costs continued to rise.

Table 4: University of Washington Daytime Cleaning Impact

Metric	Night Shift Cleaning (1997)	Daytime Cleaning (2012)
APPA Service Level	3	2
Quality Assurance Scores	Low 80 percent	Low to mid 90 percent
Production Rates Per Worker 7 hr. Shift	20,000-24,000	36,000-42,000
Worker Fatigue	Lower rates of production	High rate of production
Full-time Equivalent Employee Count	315	282
Worker Absenteeism	17-20 percent	11-12 percent
Worker Transportation	98 percent of 315 workers drove their own car to work	40 percent of 282 workers van pool to work

Healthy High Performance Cleaning

Diversey, a part of Sealed Air, launched the Healthy High Performance Cleaning (HHPC) Day Certification Program in the United States in 2010 for property management companies and building service contractors. The global chemical and equipment company also implemented the system in their LEED-certified (Leadership in Energy and Environmental Design) corporate headquarters.

Diversey identified the most significant benefits of daytime cleaning as:

- Energy reduction of between \$50,000 and \$100,000 per 500,000 sq. ft. of commercial office space
- Reduction of day porter personnel needed in some single tenant facilities. This may save an organization \$25,000 or more per year per porter.
- Reduction in cleaning worker turnover
- Increase in worker morale
- Higher quality labor pool
- Occupant view of cleaning is more positive when they see cleaning personnel
- Building occupants focus on better personal cleanliness habits of soil when they have a relationship with cleaning personnel
- Higher quality assurance scores and fewer occupant complaints

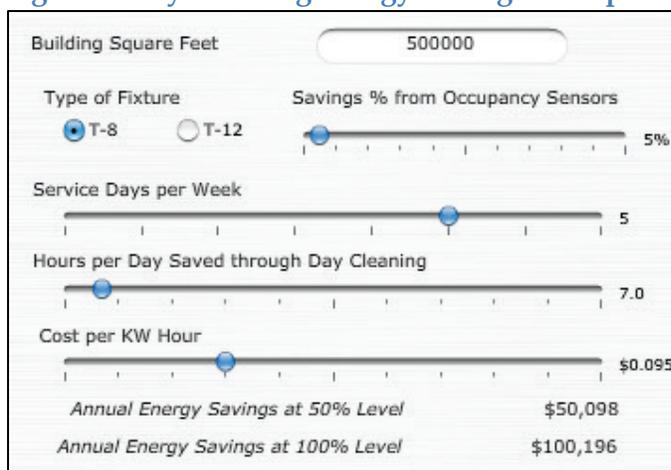
How to Estimate Energy Savings

In order to estimate the energy savings of daytime cleaning, customers should conduct a basic analysis of energy costs. The following inputs are needed when using ISSA’s Value of Cleaning software to calculate energy costs:

- **Type of Fixture:** T8's are 1" in diameter; T12's are 1 1/2". T8's run on an electronic ballast and will not run (efficiently) in a fixture with a regular ballast. A four-foot T8 is 32 watts, while the four-foot T12 is 40 watts. The commercial lighting industry is rapidly shifting towards T8 bulbs because they are more energy efficient. The driving force in the United States is the new United States Federal Minimum Energy Standards for fluorescent lights.
- **Number of Fixtures:** The typical commercial facility has a light fixture for every 50 sq. ft. of office space.
- **Occupancy Sensors:** If an organization has installed occupancy sensors to further manage lighting, the estimated percentage of savings derived from these sensors should be included.
- **Hours per Night:** Most night cleaning operations consume between 5 and 7 hours of lighting per shift on at least 260 days a year. These numbers are then multiplied by the kilowatt-hour (kWh) that a facility consumes.
- **Cost:** Electricity is measured by the kilowatt-hour (kWh). When a customer uses 1000 watts for 1 hour that is a kilowatt-hour. The most recent utility bill provides an organization’s cost per kWh. Alternatively, there are a number of websites that provide cost ranges by geographic region. One such link is www.eia.gov/electricity/monthly.

Figure 2 illustrates the energy savings generated when a 500,000 square foot office building converts to daytime cleaning.

Figure 2: Day Cleaning Energy Savings Example



Healthcare-Associated Infections (HAI)

While healthcare specific, HAIs are valuable to note for all cleaning organizations as they illustrate the fundamental correlation between clean environments and reduced cross-contamination cases. The same principles apply in an office or public setting in which cleaning activities can reduce the spread of illness, thus reducing health-related personnel costs, including lower health insurance costs and lower absenteeism, all leading to higher profits. The following data can be related to results such as the aforementioned study of The Healthy Workplace Project*, showing significant impact of improved cleaning for health.

There are innumerable studies in the healthcare arena related to cleaning, proper sanitation, hand hygiene, and best practices to reduce healthcare-associated infections (HAIs). Drawing on dozens of medical research papers and textbooks published by leading associations as well as the United States Department of Health and global health organizations that represent the interests of the healthcare market, this white paper summarizes a fraction of the many medical and scientific studies performed over the last twenty years to validate the financial ROI of improved sanitation and hygiene practices.

HAIs are infections that people acquire in a healthcare setting while they are receiving treatment for another condition. HAIs can be acquired anywhere healthcare is delivered, including inpatient acute care hospitals, outpatient settings such as ambulatory outpatient clinics, and long-term care facilities such as nursing homes and rehabilitation centers. In hospitals, HAIs lead to extended hospital stays, contribute to increased medical costs, and are a significant cause of morbidity and mortality (*Edwards, 2007*).

HAIs may be caused by any infectious agent, including bacteria, fungi, and viruses, as well as other less common types of pathogens. These infections are associated with a variety of risk factors, including:

- Contamination of the healthcare environment
- Transmission of communicable diseases between patients and healthcare workers
- Use of indwelling medical devices such as bloodstream, endotracheal, and urinary catheters
- Contaminated surgical procedures
- Contaminated injections

Annually, approximately 2 million patients suffer with HAIs in the United States, and nearly 90,000 are estimated to die. The overall direct cost of HAIs to hospitals in the

United States is estimated at \$28-45 billion. While this range may appear to be wide, one thing is certain: HAIs are expensive. In addition, most HAIs are thought to be preventable. Important policy changes include a mandate that hospitals publicly report HAI rates and a federal pay-for-performance measure that will no longer allow United States Medicare to reimburse healthcare providers for costs incurred as a result of HAIs (Stone, 2009).

Importance of Cleaning

Cleaning and proper sanitation is the removal of soil and contaminants from surfaces. It is recognized as a vital component of a comprehensive intervention program needed to reduce HAIs. Proper chemistry, cleaning friction, and the capillary effect of cleaning textiles remove soil and pathogens from contaminated surfaces, touch points and identifiable areas of transfer.

Effective cleaning and disinfection will decrease the number of environmental pathogens and reduce the risk of transmission and potential infections. Professional cleaning techniques and modern cleaning materials always play an integral part of a hospital's infection prevention and control plan.

Langone Medical Center Study

The increased incidence of hospital-acquired *C. difficile* (HA-CDI) has heightened the need to define effective control measures. Dr. Michael Phillips of New York University's Langone Medical Center performed a controlled study to measure the effect of enhanced environmental cleaning on HA-CDI using the 3M™ Clean-Trace™⁷ Hygiene Management System. This study was presented at the 2011 Society for Healthcare Epidemiology of America (SHEA) Conference in Dallas, Texas.

The preliminary data points to a reduction in HA-CDI by using specially trained cleaners in lieu of conventional housekeeping units. The adoption of best cleaning practices averted approximately 85 cases of HA-CDI annually, resulting in an estimated annual savings of \$413,000 in direct hospital costs (Phillips, MD, 2011). The results of the study are expected to be published in 2013.

Mt. Sinai's Medical Center Study

In 2012, Crothall Healthcare published a white paper detailing their integrated *Infection Prevention Approach* to reducing HAIs in healthcare facilities. Their study used the 3M™ Clean-Trace™ ATP monitoring device to document the cleaning performance of highly

⁷ 3M and Clean-Trace are trademarks of 3M

touched objects (HTO) in Mount Sinai's Medical Center in New York (*Crothall Healthcare, 2012*). This 1,171-bed hospital deployed new cleaning technology, technical training of cleaning personnel, and scientific measurement for quality assurance and improved cleaning practices.

Mt. Sinai's Medical Center findings:

- 57% reduction in *C. difficile* infection rates
- HCAHPS cleaning scores increased 60%
- 50% reduction in OSHA incidents

HAI Prevention Resource

The Association for the Healthcare Environment of the American Hospital Association (AHE) has published the second edition of its *Practice Guidance for Healthcare Environmental Cleaning*. AHE is recognized as one of the premier resources on the healthcare environment. This manual is an essential resource for environmental cleaning and disinfection. AHE guidance is based on industry research, peer-reviewed clinical evidence and best practices from other leading healthcare organizations, including the Centers for Disease Control and Prevention (CDC), the Association for Professionals in Infection Control and Epidemiology, the Society for Healthcare Epidemiology of America and the Infectious Disease Society of America. This valuable manual defines the transmission of infectious agents, healthcare-specific cleaning procedures, standards, infection prevention techniques and the basics of microbiology (*Association for the Healthcare Environment, 2012*).

Next Steps

Although cleaning has traditionally been viewed as a cost, a growing body of evidence connects cleaning to an organization's bottom line. It is clear that even relatively modest investments in cleaning produce substantial financial returns in areas often overlooked, as illustrated in this paper. The proffered information can be extremely valuable in helping to make a better case for proper levels of cleaning and the budgets they require.

If your organization has begun to review some of these areas, this paper can identify new areas to pursue. If you have not tracked or calculated any of these areas, it is recommended that you select the ones most relevant to your organization or your customers and begin there. ISSA can help you understand how to get started in tracking and correlating data.

The association offers the Value of Clean Calculator for member companies to help customers calculate savings in the areas covered by this paper (North American and International versions available at issa.com/value). A PowerPoint slide deck is available for ISSA members to include in presentations to key decision makers and upper management regarding the points covered in this paper. To gain access to these tools and find out if your vendors are ISSA members, visit issa.com/directory.

It is ISSA's position that even small measures of progress into making the connection between cleaning and the improved profits it can generate will help evolve the facility managers' understanding of how cleaning contributes to their goals and those of their entire organization.

ISSA encourages you to submit data or results your organization has found in the areas covered by this paper, or in other areas where a connection can be made between cleaning and financial gain. Through shared experiences, we can further educate the industry at large.

To share your organization's success story or relevant data, contact Dianna Steinbach, ISSA Director of Industry Outreach at dianna@issa.com, or call 847-982-0800 or 800-225-4772 (North America).

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David Frank and James Peduto of the American Institute for Cleaning Sciences (AICS) authored this document. AICS is one of the leading authorities on the commercial cleaning industry. AICS is a co-administrator of the comprehensive CIMS and CIMS-GB Cleaning Management Standard and acts as the Registrar for the CIMS/CIMS-GB certification program. AICS has authored numerous industry books, software applications, sustainability programs and other resources designed to promote professionalism in the industry. Learn more at www.aics.com.

About ISSA

The leading trade association for the cleaning industry worldwide, ISSA has a membership that includes more than 6,100 distributor, manufacturer, manufacturer representative, building service contractor, in-house service provider, and associated service members. ISSA helps its members and their employees make valuable contacts through the industry's largest cleaning shows in conjunction with Amsterdam RAI, under the brand name ISSA/INTERCLEAN®, as well as the popular global website ISSA.com. It also helps increase professionalism and member success by offering business tools, educational products, industry standards, publications, and legislative and regulatory services that specifically focus on the professional cleaning industry.

The association is headquartered in Lincolnwood, IL, USA, with regional offices in Amsterdam, Netherlands; Leicester, United Kingdom; Monterrey, Mexico; and Shanghai, China. ISSA regularly works with more than 85 associations, alliances, advocacy groups and government agencies around the world to promote the value of commercial and institutional cleaning. For more information, visit www.issa.com.

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