What's your Facility's Health Index?

A Systematic Approach to Reducing Infrastructure Costs, Operational Risks, Improving ROI, and Adherence to Compliance and Regulations

by Peter Curtis

Today's mission-critical industry executives must transition to the next-generation software intelligence solutions to gain predictive analytics insight to remediate problems, identify KPI's and transform infrastructure data into a systematic approach to establish an internal "Operational Health Index". Identifying trends that can increase risks and costs will help align organizations of all types, especially those with strict policy and regulation focus to move and stay ahead of the costs and risks.

In most regulated industries continuous operations with greater access to advanced technologies demand superior performance, flexibility, and above all reliable critical facility infrastructure. Mission-critical data centers must ensure redundancy for all engineered systems and as such obligate facilities' management to sustain operations at the highest levels of efficiency and resiliency possible. This calls for a strategic operations agenda that consistently monitors and achieves KPI's to embrace the principles of optimized service delivery: the dual objectives of uninterrupted operations with cost-effective service delivery through integration, data sharing, and accountability. The new norm is about understanding exactly what "normal" operations is for a facility whether it's healthcare, banking/finance, transportation or other – there is a precise cost associated with failure to achieve those standards.

Critical infrastructure and associated ancillary equipment and systems present unexpected risks and costs with potential revenue loss that can be generated from services provided. Advanced technologies and specialized services often translate into an arduous regulatory approval process – and failure to aid regulatory authorities in the proper oversight can result in steep, non-compliance fines. For instance, the "Environment of Care" standards – focused on reducing the impact of unpredictable failures on patient care and safety threats – require of healthcare facilities continual infrastructure uptime, similar to standards and regulations the FDA requires of the pharmaceutical or the SEC of the banking/finance industry.

These also include utility systems such as electrical, mechanical, and plumbing equipment.

Now more than ever, facilities professionals must work smarter, not harder, to improve and standardize operations. This results in increased capacity, continuous improvement in workplace safety, energy efficiency, conservation through retro-commissioning, and maintaining measured remediation plans to mitigate non-compliance. Implementing an intelligent software platform that aligns with industry regulations and establishes the necessary standardized culture across an enterprise can offer ROI as an annuity throughout the facility's lifecycle. Next-gen technology solutions for all organizations must include:

- An "Infrastructure and Compliance Health Index Dashboard" critical for continuous improvement and self-assessment of Facilities Process Management
- Constant visualization of the operational KPI's to allow execution of compliance tasks beyond Computerized Maintenance Management System (CMMS) and BMS
- Complementary technology, compatible with current and disparate building systems aggregating information that can predict events based on polling various databases.

PUTTING DATA TO WORK

The shift in popular lexicon from "smart" buildings and technologies to "cognitive" products reflects the maturing and full integration of data aggregation processes. In today's world, and in the near future, data aggregation allows some environments to be "aware" (machine learning) and,

therefore, more responsive to humans as in the case of a building's "intelligence" (from various databases) which is associated with the appearance of cognition, or the capacity to maximize awareness of true consequences. When evaluating operational risk mitigation strategies, it's critical to understand this evolution since access to an additional context in real-time can have critical implications for facility managers' success by creating highly reliable infrastructures.

It's imperative that the cost of slow and ineffective operational systems be phased into new tools that complement existing, 'non-intelligent' systems since technology is a moving target with constant evolution of software platforms. Today's databases must be scalable to future platforms to allow for seamless transition to the next-generation of intelligence.

All industries in this transitionary, digitized phase are struggling to get a handle on their specific requirements and create a proper software platform scalable with machine learning. Long-term benefits and advantages of staying on top of the data can, and will, allow for accurate evaluation and reduction of operational risks thus mitigating cascading failures just by adding a layer of active intelligence and alternative strategies.

The ROIs of replacing legacy clip board and paper spreadsheets for building performance inspections or rounds and readings, with intelligent software is indisputable when you consider that spreadsheets are stagnant data lacking trending and intelligence. Let's imagine there is a slow incremental change in steam traps that affect daily equipment costs – and can increase steam bills if no action is taken to clean the steam traps. For example, a 500-bed hospital facility could incur cost well over $100,000 per year. The cost to implement an intelligent software to alert facility operators of such a problem in real-time is a magnitude less.

The building technologies market has undergone a major disruption with the introduction of more comprehensive mobile solutions that are inherently more flexible and can also adapt to changing conditions that occur over the course of a building's lifecycle. For example, replacing a traditional BMS hardware model with vertically integrated software technologies effectively limits or ends information silos that can result from lock-in at the data level. Long-term reliability for the mission critical industry requires cross-functional integration of knowledge throughout each enterprise that is asset-tagged to the personnel, processes, equipment, documentation, maintenance, testing, training, change management, safety, remediation and, of course, risk mitigation measures. All of the above and more is identified as "Facilities Process Management".

HARD COSTS OF DATA AND ITS RELATIONSHIP TO REDUCING HUMAN ERROR AND OTHER OUTAGES

The two scenarios below measure the real cost of data, its relationship to human error and the associated downtime:

- Human Error - Studies have consistently shown that on average, 65% of equipment downtime is due to human error. Engineers have multiple products at their disposal for equipment control and monitoring – but equipment is only good as long as it's maintained and the people operating it are trained continuously. Using a conservative approach, the direct cost of a single human error event can range between $600,000 to $1,000,000. At the low-end human—or operational—error accounts for at least $390,000 an event, and, at the high-end, Chief Facilities Officers can expect to defend as much as $650,000 in losses. Examples of this could include instances when capacity of certain equipment, or systems, reach design limitations due to incremental daily increases, and the lack of trending of equipment overload causes an outage. If something as simple as trending output load is monitored daily it would allow for continuous planning that drives operating and capital budgets for equipment upgrades or replacements rather than putting the company at risk by rushing to design an upgrade at the last minute.
- Generators – Lack of understanding that equipment downtime often translates into operational disruptions and major revenue losses. For instance, consider the failure of a 24-year-old generator where during routine testing an oil injector malfunction caused its cylinder to fail due to insufficient oil. Let's imagine the event occurred during a two-hour, monthly generator inspection and load test where trending and thresholds are measured and compared to previous results. This is part the Facilities Process Management where regular testing

procedures and a maintenance programs are regularly monitored. The combined costs for replacement parts, back-up generator and labor hours are still significantly less than the projected $390,000 for labor and material needed to replace the generator as compared to a $72,000 backup generator rental. Testing the generator and having a failure is very different than the generator failing during peak processing and having the generator run-to-failure. An ounce of prevention is worth a pound of cure.

THE INTANGIBLES – HIDDEN COSTS OF DOWNTIME

To achieve 100% uptime, an enterprise can benefit from an integrated approach. All aspects of an organization can contribute to whether a facility delivers reliability and resiliency in an effective, efficient manner. Conversely, when service delivery is impeded by infrastructure, the quantifiable impacts can be understood in terms of negative effects on processing and performance, reduced productivity and irreversible harm to an institution's public image and reputation.

Building engineers and facility operators are the pulse of facility uptime and efficiency. It's imperative for organizations to deploy smart tools for every element of Facilities Process Management for employee onboarding, orientation, and education to standardize and automate operational procedures. This will also maximize individual and team efficiency by documenting, in real-time, the results of daily facility infrastructure operations and enable instant communication of problems with analytics to interpret results – and ultimately significantly reduce the learning curve and associated risks during the onboarding process.

CHALLENGES AND RISKS OF INTEGRATING IOT, MOBILE, AND CLOUD SOLUTIONS

Today organizations are well positioned to benefit from IoT, mobile, and cloud-based solutions. A holistic IoT solution for predictive maintenance must be flexible yet offer non-invasive implementation to prevent interruption of sensitive data. The advantages of such a solution are self-evident, but the move from traditional, onsite databases to off-site data centers and servers introduces a new set of challenges.

What is the cost of downtime in the age of interrelated computing devices and IoT? Uninterrupted uptime may prove to be even more elusive today as a result of the increasing interdependence of critical devices and IT systems. Cloud connectivity ensures that updates and upgrades are "coordinated and tested as a single system." Forecasting potential equipment failures involves avoiding gaps in a function that could not only increase costs in lost revenue but more importantly, potentially even in the loss of life. Today it's even more important to institute the Facilities Process Management Playbook due to the connectiveness of all systems.

CONCLUSION

No doubt, technology will remain instrumental in the ongoing evolution of various industries. Technology, especially mobile tools and devices capable of automation, communication, training, and compliance, can support all service providers in turning highly unpredictable industry fundamentals and benchmark data into useful, actionable information. Building operations management should take stock in how those in the healthcare industry for instance have improved their outcome using mobile, real-time electronic health records (EHR) to monitor both progress and ensure follow-through on remediation plans. Software solutions can have similar positive impacts and cost savings for all enterprises by providing valuable data instantly and securely—and in context.

It is time for all industry executives to get ahead and stay ahead to reduce operational risks and costs and improve ROI while staying within regulatory compliance using a Facility's Health Index.

Peter Curtis is President and CEO of PMC Group One. He can be reached at pcurtis@pmcgroupone.com.