

# **Analytics Driven Asset Management for Smarter Buildings**

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# Analytics Driven Asset Management for Smarter Buildings

## Introduction

There are many terms that float around that don't have a clear definition, and one of those terms is "Smart Buildings." Just because a building has a Building Management System (BMS) doesn't mean that building is "smart."

A smart building is a high functioning building where technology and human interface combine data and actions to keep occupants and building owners comfortable and productive at the lowest possible cost.

So what measures can you take to make your building "smart?" By combining a Computerized Maintenance Software System (CMMS), Internet of Things (IoT) and data analytics, you can ensure the efficiency, productivity and safety of your buildings and workforce.

# Product and Service Methodology

A smart building is a structure embedded or retrofitted with internet-connected devices and appliances. It is the evolution of how and where we'll be living and working in the near future, and it will greatly increase efficiency in building operations, dramatically reduce utility costs and simplify daily life for tenants and management.

Smart building technology is expected to grow by over 30 percent annually over the next few years. These technologies won't just help automate many building functions that humans normally perform; the devices will actually handle the operations themselves, using sensors and artificial intelligence autonomy to make decisions on their own. Energy management systems will be able to turn lights on or off, raise and lower thermostat temperatures, and handle HVAC control systems based on occupants without the need for human intervention. Smart infrastructure management will automate parking systems, control water usage and manage elevators and escalators.

These innovations, some of which are already in use today, will lower staff and payroll costs, reduce human error, simplify operations for building management, and more importantly, reduce carbon dioxide emissions, lower utility costs and decrease energy consumption.

Buildings contain a lot of systems, including HVAC, security, plumbing, fire alarm, and lighting systems to name a few. These systems generate a tremendous amount of data which can be stored in an asset management system to enable it to be used to improve overall operations. An asset management system is a repository for all of the information related to the assets of a building, from boilers to water fountains. Work order histories, preventive maintenance schedules, and vendor data are just some of the data contained in an asset management system.

Smart buildings use the data in an asset management system to drive improved performance. For example, this information can be used to automatically schedule a preventive maintenance activity for an asset based on a number of run hours. Similarly, alarms or abnormal conditions detected by the BMS can trigger a work order automatically from within the asset management system. Truly intelligent buildings go beyond responding to simple "out-of-state" or limit-based conditions or runtime notifications to actually look at patterns and correlations in the data from the various systems. For example, intelligent buildings combine real-time data from energy meters, heating and cooling systems, etc. to identify operational issues that represent inefficiency and waste. This is called "Analytics".



The new generation of analytics software enables us to do just that. Analytics software can automatically analyze real time and asset data to provide facility managers with actionable information. These include exception reports, energy performance summaries, and alerts that highlight inefficient operation of equipment systems. This information can be directly used by the facilities staff to fine tune asset performance and prioritize maintenance, repair, and capital investments. This will help optimize facility performance, enabling you to reduce costs and improve productivity.

The IoT is the concept of connecting any device with an on/off switch (or sensors) to the Internet and/or to each other. IoT uses one common Internet Protocol (IP) to connect devices, which include everything from smartphones, tablets and digital assistants to various types of sensors and systems such as HVAC, lighting, and security. In other words, the IoT is a fast-expanding digital ecosystem of connected devices. In 2015, there were about 10 billion connected devices; by 2020, that number will more than triple to 34 billion. This growth is not surprising given the current environment where broadband Internet is widely available, technology costs are decreasing, smartphone use is becoming ubiquitous, and more and more devices are designed with built-in sensors and Wi-Fi, 5G capabilities.

The IoT helps create dynamic, and intelligent cloud-based interoperable networks by connecting electrical, mechanical, and electro-mechanical systems and platforms. By communicating with each other, these systems can help monitor themselves and act when necessary (e.g. turn down airconditioning or heating needs in a little-used area) to provide the data and analytics needed for facility managers to intelligently optimize performance and create smarter buildings.

Organizations need a more analytical, data-driven approach to building operations and management to help maximize operational efficiency, cut energy waste, and lower overall cost. There is also an increasingly need for smart buildings that provide more comfortable, modern environments that enable people to work more effectively. In a study by the Continental Automated Buildings Association (CABA), buildings that include comfort and productivity measures (e.g., improved ventilation, enhanced lighting conditions, and green building certification measures that directly affect health and wellness, absenteeism, employee turnover, job performance and satisfaction) provide proven benefits beyond energy savings.

# Key Findings

White Paper 2020

## Key Finding 1

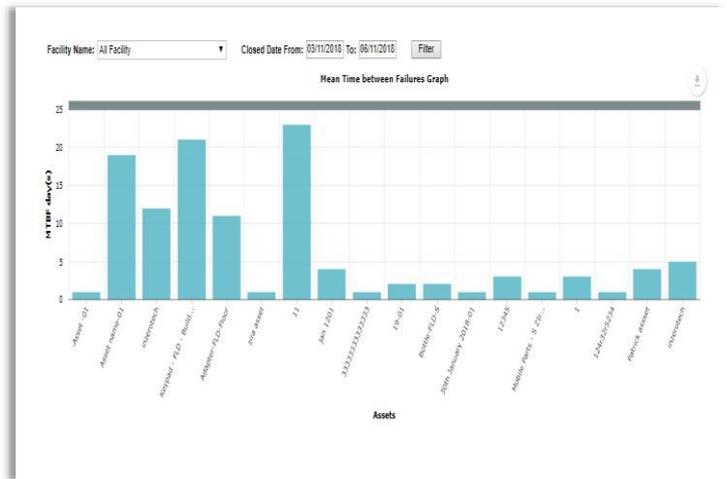
Smart building technology is expected to grow by over 30% annually over the next few years. These technologies can automatically perform functions such as turning on or off lighting to save labor and electricity costs.



## Key Finding 2

CMMS will provide savings by use of scheduling and resource management capabilities. IoT and analytics will help a building owner identify alarms, faults, diagnostics, predict potential failures.

When both are combined, owner is able to get actionable data. By taking data driven actions, owner will realize benefits such as improved equipment condition and life, reduced downtime. This also results in improved sustainability and reduction in energy usage.



## Key Finding 3

Use of AI and Machine Learning technology allows you to use work order history data (on machine maintenance) to improve results of analytics.

Natural language Chat Bots, such as "Ask Steve" will assist a maintenance person, a technician or a manager get valuable insights into the data to make informed decisions.



# Visual Data

## White Paper 2020

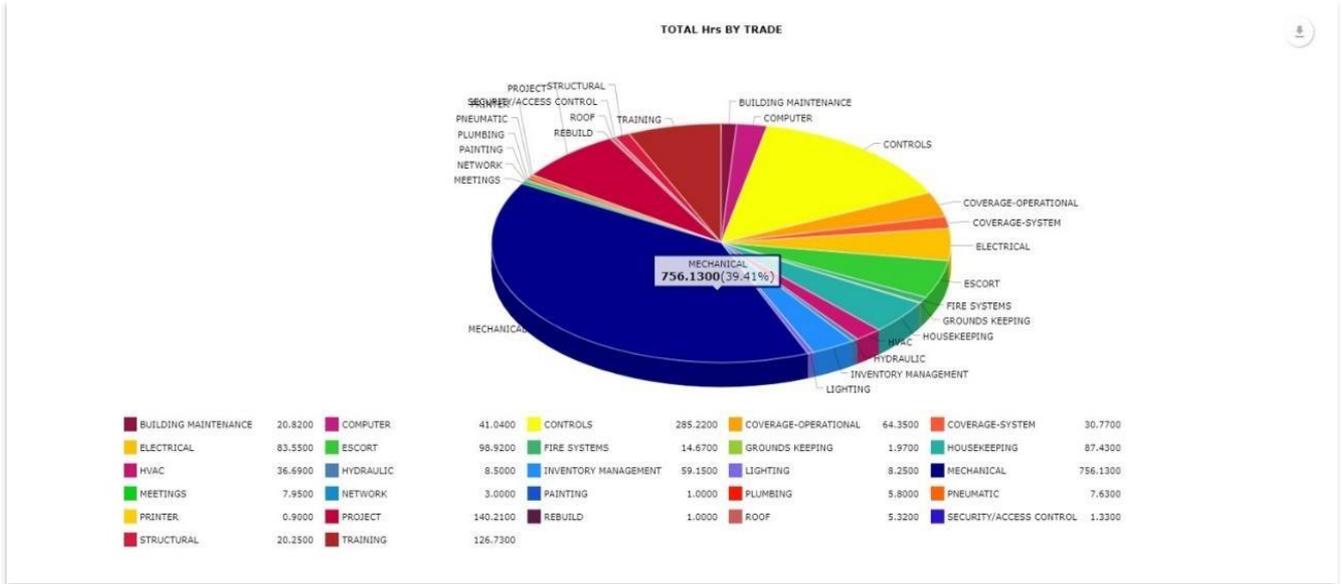
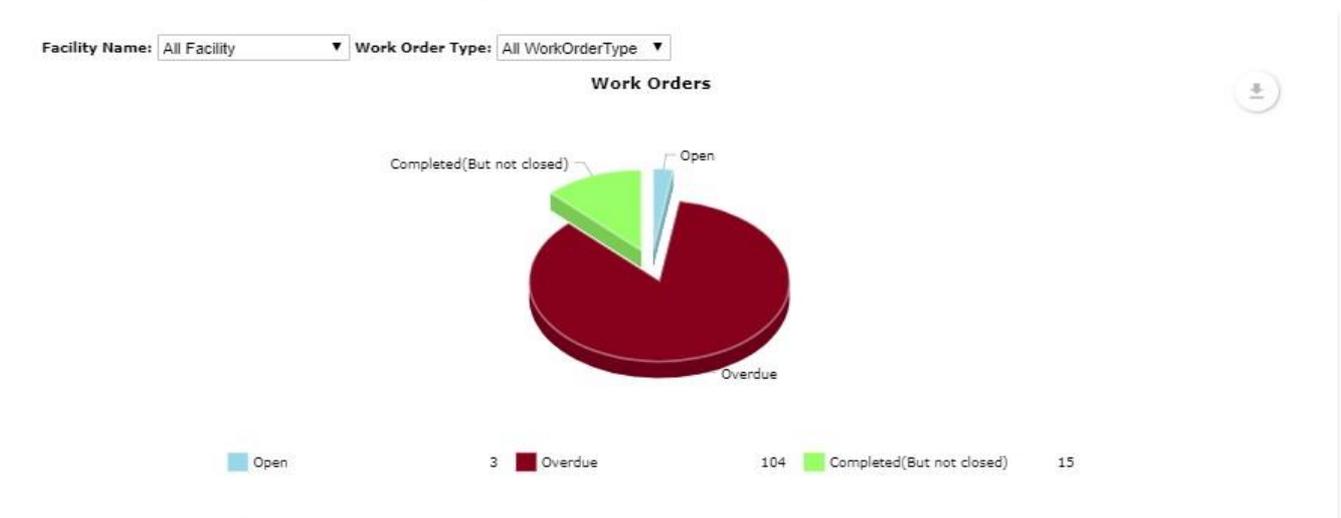


Image: Proteus MMX Key Performance Indicators



Image: Proteus MMX Mean Time Between Failure





# Conclusion

## Key Takeaways

- Connected buildings offer a great value to owners and occupants. CMMS and facility management systems offer scheduling and tracking of resources and activities. When combined with IoT and analytics, they offer additional value to optimize maintenance resources, predictive maintenance and prescriptive maintenance.
- We recommend that building owners take a long view of these technologies. Investigate how technology will improve their operations and equipment life.
- These technologies and integrations have shown to deliver results in all types of buildings and equipment. We recommend owners to start with a pilot project. Based on results and experience, consider expanding to cover all properties.



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