

Alarm Monitoring at Home & on the Industrial Floor

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Are You Feeling Unsafe at Home? Smart Alarms Might Help!



By: Olga Yashkova

Who Needs Smart Alarms & Why?

Feeling safe at home is important to enjoying daily life and is a high priority for many families today. That is why home owners have long turned to traditional security systems to protect their homes and keep their families and safe.

Advances in technology and how it is applied, however, challenges these traditional systems and their adequacy and legitimacy in the present-day home security market.

The IoT is an exciting and natural “next step” in the home security market. The IoT has made home security more accessible to homeowners, less expensive, and more efficient than ever before. It is quickly expanding into people’s everyday lives and becoming critical for developers as well as homeowners working towards reducing vulnerabilities in security and privacy.

What Constitutes a Smart Home?

Customization Opens the Door for Diverse Preferences

Currently there are over 65 million “smart” homes in North America. They range widely in sophistication and customization. And their features are based on homeowners’ preferences.

Some simply have connectivity and smart devices (think Amazon Echo and Google Home), while others have managed alarm systems with motion detectors and video sensors. Still others have entertainment

and multimedia systems with automated window coverings and interior lighting that sense presence within a room. Pricing for these options can range from hundreds to hundreds of thousands of dollars. The managed alarm and smart home services market is dominated by players such as ADT, Vivint, Alarm.com, Comcast, Xfinity Home, and others.

Modern Versus Traditional Home Security Systems

In the old days, telling someone you had a home security system simply meant, “I have an alarm system that sounds off when my house is broken into.” Smart connected homes offer

more than that. Although smart home security systems do alert the homeowners of burglar break-ins by sending notifications to their smart phones, they also allow homeowners to remotely stop/start alarms using their smart phones.

With connected sensors strategically placed on doors and windows, smart home security systems also empower homeowners to better protect their homes by monitoring entry/exit activity (again) via their smart phones.

When questioned about their motivations for being interested in IoT, 70% of participants in a recent James Brehm & Associates survey responded that safety and security were primary motivators.

Additionally, 50% of respondents listed convenience and smart home appliances as one of their top motivating factors.

The managed alarm and smart home services market generates annual revenues of \$21 billion with tens of billions annually from consumer hardware components such as Ring, Nest, Amazon Echo etc.

Source: James Brehm & Associates

IoT's Role in Smart Home Security

Smart home security systems are highly customizable and leverage the power of IoT and connected sensors to provide homeowners greater home security by granting them the ability to remotely control lights, thermostats, door locks, etc, as well as the ability to remotely monitor their homes (and receive alerts of) suspicious activity (e.g. unusual noises, movement, inside or immediately outside of the home, etc.). Basic systems usually consist of a few door and window sensors, a motion detector, and a central control system that communicates with the above-mentioned devices using one or more wireless protocols such as Wi-Fi, Z-Wave, ZigBee, or an exclusive mesh network. Customers may choose to add extra door, motion, and window sensors to provide additional coverage of their residence. They could even design a comprehensive system that consists of door locks, garage door openers, indoor and outdoor cameras, lights, sirens, smoke/CO detectors, water sensors, and more. The most important element of the connected home security system is a smart control panel which communicates with all smart home devices in the home.

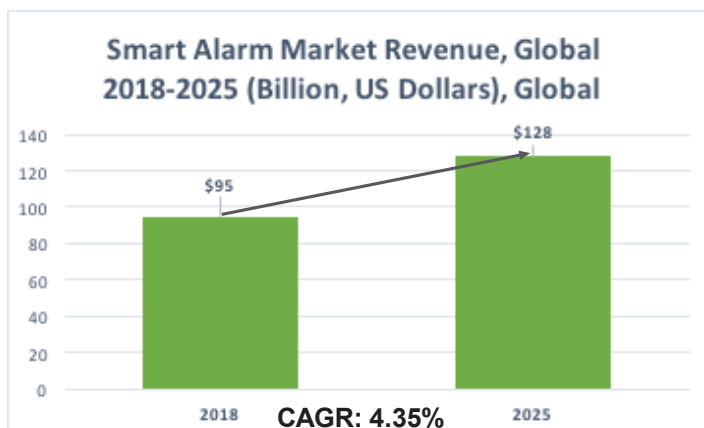
Benefits of Smart Home Security Systems

The smart home is one of IoT's many great developments. The following are some major benefits of smart home security systems:

- Homeowners are alerted to unusual sounds as well as changes in motion, heat, and sound.
- Smart systems gather and analyze data about residents' preferences and auto-adjust temperature, noise levels, and other electronics accordingly.
- As security systems become more sophisticated, so, too, will their ability to proactively protect families from a wider variety of hazards and/or dangers than they had been able to before.

By 2025 this market is expected to generate \$128 billion in revenue globally due to increasing rates of adoption of different types of smart security devices in households.

Source: James Brehm & Associates



Source: James Brehm & Associates

Addressing IoT Security Risks with Artificial Intelligence & Machine Learning

With the understanding that IoT ecosystems are more susceptible to security breaches, the industry is turning to technologies such as Artificial Intelligence (AI) and machine learning to address this challenge.

By drawing on security logs full of data, AI is equipped to continuously detect, probe, and learn from threats in order to better direct security fixes in real-time during cyber-attacks much faster than a human would be able to. Machine learning enables smart appliances to self-monitor and self-diagnose firmware issues and send notifications to users when the need for a security fix is detected. Users can authorize the smart appliance to download security fixes by itself.

Built on recent advances in voice control and augmented reality (AR), an intelligent, voice-controlled assistant serves as a viable control center for smart homes. Many companies have jumped on this bandwagon to develop solutions delivered through both existing devices and new, stand-alone products.

In addition to AI, AR, and machine learning, there is also a growing trend today towards local processing and edge, especially when it comes to cybersecurity. New edge devices are becoming increasingly intelligent and can perform system-wide integrations and analytics without having to go to the cloud.

Because IoT devices are known to be more vulnerable to security breaches, developers and consumers must implement high levels of security on all devices in order to safely and successfully reap the full benefits of IoT while avoid hackers.

Consider for example, systems that can perform facial recognition within a camera itself and send only the results to the cloud as opposed to having to send a full video stream to the cloud for processing.

Sensors are no longer limited to performing a single task. There is a growing trend towards adopting multi-purpose sensors that are capable of measuring many things at the same time: motion, lighting, environmental conditions, air quality, sound, and more. The more they can measure, the more intelligent the household can become.



Video Surveillance

Smarter video surveillance is getting a lot of traction as well in the home security monitoring market. Things like facial recognition, people counting, and package detection are no longer new concepts in security surveillance. Such capabilities used to require massive processors, large servers, enterprise-grade network security, and trained technicians, but today they can be achieved with smaller processors and simpler solutions that consumers can install themselves. Additionally, much of the intelligence can be handled locally, at the edge, so that more sensitive data stays on-premises.

The video search and reviewing mechanisms in surveillance systems continues to gain new features. As video surveillance becomes more omnipresent, so are the methods for reviewing large amounts of video footage. Google, for instance, can search video data for people, things, activities, and other criteria.

5G

With 5G deployments imminent on the horizon, we expect new IoT devices will one day completely bypass home networks and communicate directly with the cloud via cellular. In addition to the promise of 5G, there are several cell-only devices including cameras (such as Netgear Arlo) and access control systems (such as CellGate Watchman), which do not need Wi-Fi to be available, and which--due to their reliance on cellular systems--continue to function even when power outages occur.

Home security is a catalyst for wider IoT adoption. The opportunities are unlimited as everybody wishes to protect their homes and what matters most. IoT home security systems are disrupting the market for more traditional systems because they do not require wiring and are more cost efficient due to their increased reliance on WiFi.

The growing trend towards DIY home security devices is prompting vendors such as Apple and Amazon (among others) to provide more of these security and automation systems.

These DIY systems, however, lack support and professional services such as advanced integration, video verification, systems configuration, false-alarm mitigation, etc

Also, the system setup is very user friendly—simply place the device in the room and connect it to the residence router. By using a simple smart phone app, one can manage the settings and arm/disarm their system remotely.

The following home security products are available on the market today: all-in-one security systems, speakers and hubs, video surveillance systems, and access control alarm systems and locks—the latter of which seem to be dominating the home safety and security market and will be expected to increase in the years to come. Home security devices and systems can either be installed professionally or by users themselves do-it-yourself (DIY) style.

ADT vs. Alarm.com

There is a multitude of home security service providers available on the market now. We would like to compare two top smart home alarm systems, ADT and Alarm.com.

Installation

ADT is an all-inclusive, one-stop-shop home security system that offers various bundled options for their customers, and Alarm.com is a home security monitoring service that uses a mobile application to fully control the home security system. Both companies offer DIY and professional installation, depending on the vendor their customer decides to work with. Alarm.com is compatible with many home security vendors' equipment and can facilitate security system monitoring from anywhere in a world. Both companies' services can be used by either homeowners or renters. In addition, the live streaming video option is available from both companies.



Contract Agreements

Going with ADT involves a 3-year contract which the company back up with a 6-month service quality guarantee. In case of dissatisfaction with their services, customers will receive a full refund if they return the equipment within the 60-days.

Alarm.com, on the other hand, does not require a contract for the use of its services, however, the service providers they partner with may require a contract.

Services Offered

ADT has a home automation option as well as medical or “panic” buttons with built-in GPS, environmental disaster protection, and cellular service options. All of ADT’s equipment is wireless and extremely user-friendly. Moreover, ADT’s motion sensors are pet-friendly, and the video doorbell viewer is enabled with two-way voice communication.

As a white label service, Alarm.com offers live video streaming, wellness alternatives that can be monitored through a downloadable app, a video doorbell, and a smart thermostat. Alarm.com’s system is also compatible with Google and Alexa platforms. Furthermore, Alarm.com also offers “Crash and Smash” protection, environmental hazard detection and motion detection sensors.

Security Packages

As far as pricing is concerned, ADT has three basic packages: the “Traditional,” the “Control,” and the “Video” package. All packages require \$125 upfront for installation. As far as monthly fees go, the Traditional package costs \$29 per month, the Control package costs \$37 per month, and the Video package costs \$53 per month. The company also has an option to monitor services of already installed home security equipment for \$19 per month.

The price for Alarm.com’s services, on the other hand, depends on the customer’s choice of authorized service provider.

Both companies use cellular and WiFi connectivity. Each system, therefore, can contact local authorities as well as customers in the case that an emergency should occur.

Both companies’ systems require an expert for installation. The only difference between ADT and Alarm.com is where the responsibility for installation is placed. ADT, for instance, is responsible for its own installation whereas in Alarm.com’s case, the customers’ choice of service provider is held accountable for installation.

Final Thoughts

Even though ADT is one of the more expensive systems on the market and is considered to be a one-stop-shop for a homeowner because of its features and convenience. Alarm.com, with the home automation services and options it provides is also a great option for consumers looking for the latest home security features.

Ultimately, customers will have to decide which product and suite of services best fits their home protection needs as well as their budget. Fortunately, the increasing number of IoT-enabled home protection options will give customers a wide range of solutions to choose from.



Challenges in Alarm Management and Monitoring in Industrial Application: IoT is the Answer!

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The Industrial Floor Is Getting More Complex

Enter, the Internet of Things (IoT)

IoT offers many industries (such as manufacturing) the opportunity to build powerful systems and applications with new benefits, and it has been steadily gaining momentum in recent years. As industrial systems have become increasingly complex, so, too, has the number of alarms in manufacturing facilities grown increasingly large. Having too many alarms to manage makes it more challenging for plant operators to make the right decisions in a timely manner, potentially leading to security, safety, privacy, and reliability issues.

Where Is the Data Coming From?

Today, alarm-related information comes from an increasingly wide variety of sources and is not strictly limited to process automation. Cybersecurity and asset management systems as well as other subsystems deliver data that is relevant to alarms. As a result, the amount of data is increasing exponentially and becoming extremely difficult to manage.



Industrial Alarm Management

Alarm Data Must Be Savvily Displayed to Maintain Uptime & Business Continuity

Alarm systems are necessary in industrial applications to enable quality and safety in manufacturing as well as efficiency in plant operations. Uptime and business continuity are top priorities to the manufacturing industry which continues to be a large player in the overall business ecosystem. Displays which show alarms and large amounts of information can easily become overwhelming to operators. Modern smart alarm systems enable businesses by providing them a more streamlined and comprehensive view via multifunctional displays.



Proper Alarm Classification Is Key

Making sense of large amounts of data is a daunting challenge to operators and carries the risk that alarms might be categorized with the wrong priority, leading to the wrong course of action. Currently, many manufacturing facilities continue to use older legacy alarm management processes that are seldom evaluated for alarm limits and priorities—a practice which negatively impacts the speed and accuracy of the plant operator's response to a problematic situation.

Without a well-established, new-generation alarm management and monitoring system, manufacturing processes will be vulnerable to disruption via false alarm triggers which prevent operators from correctly identifying the critical alarms and signals and acting upon them to resolve potentially harmful issues at a plant.

The amount of data alarms provide can be overwhelming to operators; thus, it is no longer enough to show alerts. Process automation industry is exploring the benefits of the visual and audio indicators such as sound buzzers and colored lights bulbs to capture the operators' attention to deal with the situation thoroughly and in a timely manner.

On average, a typical manufacturing facility loses about 6% of its total capacity every year to interruptions and downtime. That's roughly the same percentage due to issues related to product quality. Proper classification of alarms before an operator seems them is critical.

New Tech Applications Offer Hope

New IoT platforms integrate sensing, identification, processing, communication, analytics, and networking capabilities into industrial processes and applications. This allows for remote monitoring and control of the manufacturing process across the network infrastructure. Manufacturing facilities with smart alarm management and monitoring systems continue to report reduced maintenance and insurance costs.

Alarm Integration

There's a real demand for integrated alarm management solutions that can manage and monitor alarms from different multi-vendor systems. Such a solution would be able to ensure proper alarm classification and prioritization, both of which are critical to the efficiency of the manufacturing process and to quick decision-making. The insight unlocked from reviewing manufacturing equipment performance history could help operators predict equipment lifespan.

Currently, there is also a movement among manufacturing facilities operators to move beyond the initial stages of implementing a full alarm management strategy (e.g. alarm rationalization and KPI reporting) to a more proactive alarm management lifecycle that is outlined in the International Society of Automation (ISA) 18.2 standard. Fresh approaches such as Big Data analytics will provide end users with new insight into why alarms happened and will go beyond simply reporting that they did, in fact, happen.

Alarms in a manufacturing facility usually originate from various multivendor systems. IoT can be used to integrate these alarms and enable the operators to identify the underlying cause of an issue in a timely manner. Added to existing systems, sensors enhance the overall efficiency of an alarm management system. Additionally, condition-based monitoring also enhances current alarm management systems by integrating the rotating machines that use current, temperature, and vibration sensors that create alarms with traditional alarms to complete a value chain and ensure intelligent alarm management and monitoring.

Integrated Operator Response Guidance

Operator response guidance should be integrated into an alarm management solution. There are numerous situations where operators are unable to efficiently deal with abnormal situations. Integrated operator response guidance would provide the operator with much-needed advice depending on the situation, thus, improving efficiency of alarm management and monitoring processes.

Cloud-Hosted Applications

A cloud-based alarm management and monitoring application would help a manufacturing facility to improve the overall alarm management process. Off-site, it provides the operations manager access to real-time meaningful alarms and helps facilitates quick action. Larger plants with numerous sites will benefit significantly from a centrally managed, cloud-based solution for alarm management. Having a central alarm management and monitoring location simplifies the management process and saves money. Smaller organizations that do not have enough resources will also benefit from a cloud-based alarm management solution. It eliminates the need for an on-site IT infrastructure management, thus, also leads to significant cost savings.

AR and VR Technologies

AR and VR technologies can make operations more efficient by saving time to resolve issues. Issue resolution consists of two parts:

- Finding the root cause of the problem
- Fixing the problem

Historically, it takes about 80% of the time to identify an issue or a problem and 20% of the time to resolve it. AR and VR technologies significantly reduce the time spent to finding the root cause of the alarms and help enable quick resolution of an issue.

Even though alarm monitoring and management has been used in the manufacturing industry for more than 20 years, IoT is taking it to a new level. Manufacturing facilities are experimenting with augmented reality (AR) and virtual reality (VR) in order to improve alarm management and reduce the mean-time-to-repair (MTTR). IoT offers tremendous opportunities for emerging industrial applications that address numerous requirements such as automated and pro-active monitoring, control, decentralized decision-making, and maintenance.

Final Thoughts

Every modern manufacturing facility requires an effective alarm management and monitoring approach that enhances the plant's operational efficiency and timely discovery of failures. IoT not only addresses these issues but deliverables data that can be used for predictive and prescriptive analysis. When it comes to operations, it's all about production. Most definitely, IoT has answers to this critical challenge!

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January 7-10, 2020
Las Vegas Convention Center
3150 Paradise Rd
Las Vegas, NV, 89019

IoT Evolution Expo
February 12-14, 2020
Greater Fort Lauderdale/Broward County Convention Center
1950 Eisenhower Blvd,
Fort Lauderdale, FL 33316

Mobile World Congress (MWC) Barcelona
February 24-27, 2020
Fira de Barcelona
Avinguda de la Reina Maria Cristina, s/n, 08004
Barcelona, Spain

Modex 2020
March 9-12, 2020
Atlanta's Georgia World Congress Center
285 Andrew Young International Blvd NW
Atlanta, GA, 30303

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