Beyond remote monitoring

Digital rodent control field deployments at scale

By Tom Jackson, Matt Medici and Ryan O'Day

Introduction

In today's rapidly evolving Pest Control industry, remote monitoring technology is revolutionizing the way Pest Control Operators (PCOs) operate. The integration of Internet of Things (IoT) sensors and advanced analytics enables PCOs to provide more efficient, proactive and effective services. This guide will walk you through the best practices for deploying remote monitoring systems, ensuring your business maximizes the benefits of these enhanced digital capabilities.

Microshare, which has deployed IoT-driven data solutions across a dozen industries globally, approaches these issues from a unique perspective. Remote monitoring devices for rodents, termites and other pests is not a new idea, but existing products focus on hardware rather than the vital software layers. EverSmart Rodent turns that model on its head by applying the rigor of iterative software development, algorithmic tuning powered by Artificial Intelligence and Machine Learning (AI/ML) and the real-world insights of nationwide field pilots and laboratory testing.

To the extent that digital rodent control devices have disappointed and failed to become ubiquitous, there are a number of causes. First, the use of Bluetooth or Wi-Fi eliminates a good deal of the benefit that flows from digitizing the process – for instance, being able to know what's happening at a distant site without having to conduct a site visit. What's more, those networking methods open clients to cyber risks by exposing their corporate networks to hackers. Finally, small test bed deployments – a few connected traps here and there among the legacy bait box fleet – fails to create the critical mass needed to harvest efficiency gains, cost savings and serious improvements in rodent control performance. That kind of toe-dipping just will not prove out the technology. The history of digital innovation in business shows that scale matters, whether it's the ATM in digital banking, Excel spreadsheets in accounting or sensors in bait boxes. The meek may well inherit the earth, but they're unlikely to take the actions needed to transform and thrive in a highly competitive industry like Pest Control.

Microshare developed EverSmart Rodent in the field with a Top 10 European PCO on a nation-level test bed, the Republic of Ireland. We experimented, evolved, fell on our faces then got up and finally succeeded beyond our hopes. It took time and money, but by deploying 25,000 traps with our Irish PCO partners and sticking to our knitting, we transformed their financials from labor costs to materials to profits and average deal size. Then, we subjected the product to a series of more tactical field tests with our distribution partner Pelsis in the UK and the Philadelphia-based PCO Aardvark Pest Management. This led to learnings and best practices that we outline in the following paper to ensure digital transformation and its many benefits can be achieved quickly, efficiently and without undue disruption to business operations.

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CHAPTER ONE: Deployment best practices for remote monitoring in the Pest Control industry

1. Establishing a deployment plan and timeline

Effective deployment starts with a well-structured plan. Begin by outlining the key objectives of your remote monitoring initiative. Identify the specific areas and sites where sensors will be deployed, considering high-risk zones and areas with frequent pest activity.

- **Objective Setting:** Define what you aim to achieve with remote monitoring, such as reducing pest incidents, improving response times, or enhancing data accuracy.
- **Site Selection:** Prioritize locations based on pest activity data, customer feedback, and environmental factors.
- **Timeline Development:** Create a realistic timeline that includes preparation, installation, calibration, and initial monitoring phases.

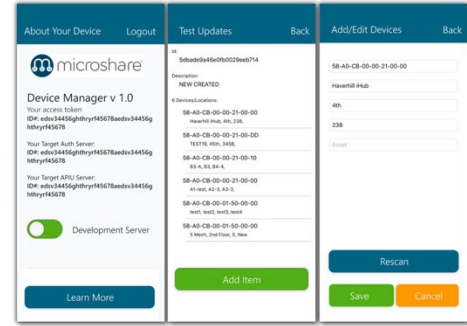### 2. Training technicians on new equipment and software

Your technicians are the frontline users of remote monitoring technology. Providing comprehensive training ensures they are comfortable and proficient with the new tools.

- **Hands-on workshops:** Conduct practical training sessions where technicians can interact with the equipment and software.
- **Digital tutorials:** Develop easy-to-follow video tutorials and user manuals for ongoing reference. Microshare provides a library of such resources.
- **Continuous support:** Establish a support system for technicians to ask questions and troubleshoot issues as they arise.

3. Ensuring proper installation and calibration of sensors

The accuracy and reliability of your remote monitoring system depend on the correct installation and calibration of sensors.

- **Installation guidelines:** Follow manufacturer instructions meticulously to ensure sensors are installed at optimal locations and angles.
- **Calibration procedures:** Regularly calibrate sensors to maintain accuracy. This may involve adjusting sensitivity settings based on environmental conditions and pest activity levels.

Available for iPhone and Android

Click the image above for specs and video tutorials

- **Testing:** Conduct initial tests to verify sensor functionality and data transmission before full-scale deployment.

4. Periodic review and maintenance of deployed sensors

Maintaining the integrity of your remote monitoring system requires regular reviews and maintenance.

- **Scheduled inspections:** Implement a routine schedule for inspecting sensors to check for damage, battery life, and connectivity issues. EverSmart Alert's IoT Monitor feature provides instant visibility in to issues like battery life and connectivity.
- **Data analysis:** Use collected data to identify patterns that might indicate sensor malfunctions or areas needing adjustment.
- **Upgrades and replacements:** Stay updated with the latest sensor technology and replace outdated or faulty equipment promptly.

5. Integrating remote monitoring with existing systems

For seamless operations, integrate remote monitoring data with your existing pest control management systems.

- **Software compatibility:** Ensure the remote monitoring software is compatible with your current management tools, such as CRM systems or field service management software.
- **Data integration:** Develop protocols for importing and exporting data between systems to maintain a unified view of pest control operations.
- **User training:** Train staff on how to leverage integrated data for enhanced decision-making and reporting.

Conclusion

Deploying remote monitoring technology is a transformative step for any pest control business. By following these best practices, you can ensure a smooth implementation process, leading to significant improvements in efficiency, accuracy, and customer satisfaction. Embrace the innovation and energy that remote monitoring brings to the industry and position your business at the forefront of technological advancement.

With a well-thought-out deployment plan, thorough training, proper installation, regular maintenance, and seamless integration, your business will not only adapt to but thrive in this new era of pest control. Get ready to experience the future of pest management with remote monitoring technology.

CHAPTER TWO: 'Outside-the-box' remote monitoring: Integrating open area sensors with other systems

Introduction

Effective pest control in open areas, both indoors and outdoors, requires a cohesive approach that integrates various monitoring systems for a unified pest management strategy. This integration is crucial for creating a comprehensive solution that addresses diverse environments, from vast outdoor spaces to large indoor areas like warehouses, factories, or institutional buildings.

1. Compatibility and Integration

Ensure that open area sensors are compatible with your existing remote monitoring infrastructure, regardless of whether they're deployed indoors or outdoors. This compatibility is essential for creating a seamless network that can monitor various environments simultaneously.

- **Indoor applications:** In settings like drop ceilings, wall voids, or under food service lines, sensors should integrate with existing dashboards and data sets to provide a more comprehensive view of the customer location.
- **Outdoor applications**: In a similar way, for exterior deployments, data from these sensors must flow into dashboards and data sets to maintain a comprehensive view of the data, rodent patterns and to feed AI/ML and other advanced.

Use APIs and data integration tools where appropriate to consolidate information from multiple sources, allowing for a holistic view of pest activity across all monitored areas.

2. Centralized dashboard

Implement a centralized dashboard that provides a comprehensive view of pest activity in all monitored spaces. This unified interface should:

- Display real-time data from both indoor and outdoor sensors.
- Offer customizable views to focus on specific areas or types of environments.
- Provide alerts and notifications that differentiate between indoor and outdoor events.
- Allow for easy comparison of pest activity patterns across different types of spaces.

This centralized approach helps in making informed decisions and coordinating responses, whether dealing with rodents in a warehouse or insects in an outdoor storage area.

3. Seamless data flow

Establish protocols for seamless data flow between different systems, ensuring real-time updates and accurate reporting across all monitored areas.

- **Data standardization**: Implement a common data format that can accommodate information from various sensor types and locations.
- **Network connectivity**: Ensure robust connectivity for both indoor and outdoor sensors. This might involve different solutions such as Wi-Fi for indoor sensors and cellular or LoRaWAN for outdoor deployments.
- **Data security**: Implement strong encryption and access controls to protect sensitive information, especially when integrating with existing building systems.

4. Adaptive monitoring strategies

Develop strategies that can adapt to the unique challenges of both indoor and outdoor open areas:

Indoor challenges:
- Account for human activity patterns in different indoor spaces.
- Adjust sensitivity based on the specific indoor environment (e.g., food processing areas vs. storage spaces).
- Consider the impact of HVAC systems and building materials on pest behavior and sensor performance.

Outdoor Challenges:
- Adapt to changing weather conditions and seasonal variations.
- Account for wildlife interference in exterior sensor deployments.
- Implement strategies to distinguish between target pests and non-target species.

5. Cross-environment analysis

Utilize data from both indoor and outdoor sensors to gain deeper insights into pest behavior and movement patterns:

- Analyze how exterior pest pressures impact indoor infestations.
- Identify correlations between indoor environmental factors (temperature, humidity) and outdoor pest activity.
- Use predictive modeling to anticipate how changes in one environment might affect pest activity in another.

Conclusion

Design your integrated system to be scalable and flexible, accommodating the dynamic nature of pest control across varied environments. Allow for easy addition or relocation of sensors as monitoring needs change. Implement modular software solutions that can adapt to new sensor types or environmental factors. And ensure the system can grow with your business, handling increased data loads and more complex monitoring scenarios. By taking this comprehensive approach to integrating open area sensors, pest control operators can offer a truly holistic service that addresses pest management needs across all types of environments. This integration not only improves the effectiveness of pest control measures but also provides clients with a more complete picture of their pest management situation, both inside and outside their facilities.

Open area sensor captures rodent activity during Microshare's 2024 field testing with Aardvark Pest Management in Philadelphia, PA. Read the related white paper here: https://www.microshare.io/2024/06/26/transforming-rodent-control-remote-monitoring-and-the-future-of-pest-control/

CHAPTER THREE: Dashboard Analytics: Unlocking the Power of Remote Monitoring Data

Introduction

Remote monitoring technology is a game-changer for rodent control, providing real-time data that can significantly enhance service efficiency and effectiveness. Central to harnessing this data is the use of sophisticated dashboard analytics. These tools transform raw data into actionable insights, enabling PCOs to make informed decisions and optimize their operations. This article will guide you through the best practices for setting up and utilizing dashboard analytics, ensuring your business maximizes the benefits of this powerful technology.

1. Setting up and customizing dashboards for different roles

The first step in leveraging dashboard analytics is to set up and customize dashboards tailored to the specific needs of various roles within your organization.

- **Role-based dashboards:** Create customized dashboards for different roles, such as technicians, office managers, and executive leaders. Each dashboard should highlight the most relevant data for the user's responsibilities.
- **User-friendly interface:** Ensure the dashboards are intuitive and easy to navigate. Use visual aids like charts, graphs, and heatmaps to present data clearly.
- **Customization options:** Allow users to personalize their dashboards by selecting the metrics and views that are most important to them. This enhances engagement and ensures that each user gets the most out of the tool.

2. Interpreting Key Performance Indicators (KPIs)

Dashboards are only as useful as the data they present. Identifying and interpreting the right KPIs is crucial for effective pest control management.

- **Identify KPIs:** Determine the most important KPIs for your business, such as pest activity levels, response times, and treatment success rates.
- **Thresholds and alerts:** Set thresholds for these KPIs to trigger alerts when certain conditions are met, allowing for prompt action.

- **Regular reviews:** Schedule regular reviews of KPIs to track performance over time and identify trends. Use this data to inform strategic decisions and operational adjustments.

3. Identifying trends and anomalies in data

One of the key benefits of dashboard analytics is the ability to spot trends and anomalies that might indicate emerging issues or opportunities for improvement.

- **Trend analysis:** Use historical data to identify patterns in pest activity. This can help predict future outbreaks and optimize scheduling for preventive treatments.
- **Anomaly detection:** Implement tools that highlight anomalies in the data, such as sudden spikes in pest activity or unexplained sensor malfunctions. Investigate these anomalies to determine their cause and take corrective action.
- **Visualization tools:** Leverage advanced visualization tools to make trends and anomalies easy to see at a glance. Heatmaps, line graphs, and bar charts can be particularly effective.

4. Reporting and visualization tools

Effective communication of data insights is crucial for driving action. Reporting and visualization tools within your dashboard can help achieve this.

- **Custom reports:** Create custom reports that summarize key findings and insights from the data. These reports can be tailored to different audiences, from technicians to executives.
- **Real-time updates:** Ensure your dashboard provides real-time updates, so users always have access to the most current data.
- **Export options:** Include options to export data and reports in various formats, making it easy to share insights with clients and stakeholders.
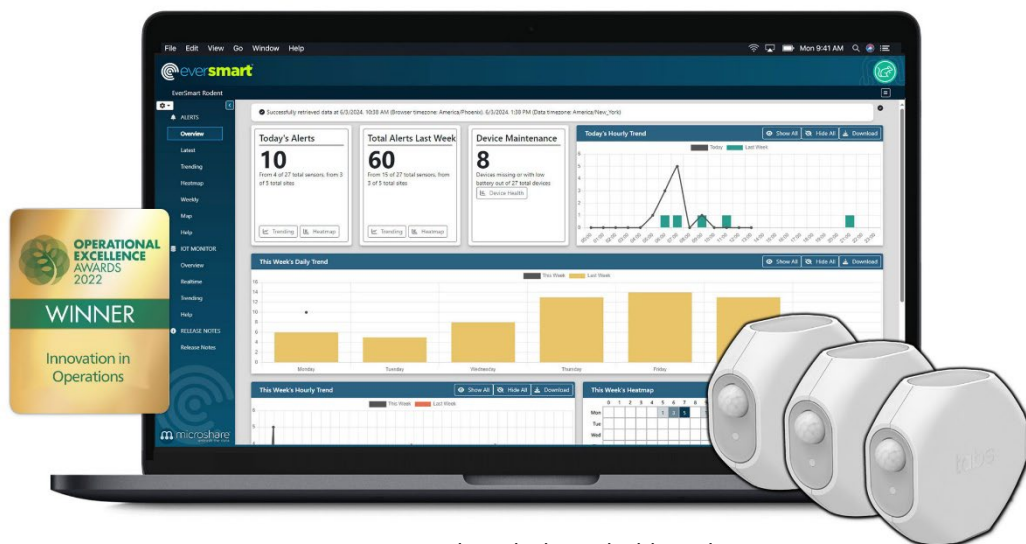
EverSmart Rodent desktop dashboard

5. Training staff to use dashboard analytics effectively

To fully realize the benefits of dashboard analytics, it's essential that your staff is well-trained in using these tools.

- **Comprehensive Training Programs:** Develop training programs that cover all aspects of dashboard use, from basic navigation to advanced data analysis techniques.
- **Hands-On Practice:** Provide opportunities for hands-on practice, allowing staff to explore the dashboards and become comfortable with the tools.
- **Ongoing Support:** Establish a support system where staff can get help with any issues they encounter. This could include a helpdesk, online resources, and regular training refreshers.

Conclusion

Dashboard analytics are a vital component of modern pest control, transforming raw data into actionable insights that can drive significant improvements in efficiency and effectiveness. By setting up customized dashboards, identifying and interpreting key KPIs, spotting trends and anomalies, utilizing reporting and visualization tools, and training staff effectively, PCOs can unlock the full potential of remote monitoring data.

Embrace the excitement and innovation that dashboard analytics bring to the table. This technology not only enhances your operational capabilities but also positions your business at the forefront of the pest control industry.

CHAPTER 4: Remote Monitoring and the PCO office manager: Enhancing efficiency and decision-making

Introduction

The integration of remote monitoring technology into PCO operations is not just a boon for field technicians but also an important elevation of the role played by office managers. With real-time data and advanced analytics at their fingertips, PCO office managers can streamline workflows, improve decision-making and enhance overall service delivery. This chapter explores the best practices for utilizing remote monitoring technology in the PCO office, ensuring maximum efficiency and effectiveness.

1. Streamlining workflows through automation

Remote monitoring technology can significantly streamline office workflows by automating routine tasks and processes.

- **Automated alerts and notifications:** Set up automated alerts for specific rodent activity thresholds, ensuring prompt action without constant manual monitoring. This reduces the workload and allows office managers to focus on more strategic tasks.
- **Task scheduling and assignment:** Use data from remote monitoring systems to optimize scheduling and assign tasks based on real-time needs. This ensures that technicians are dispatched efficiently, reducing response times and improving service quality.
- **Inventory management:** Automate inventory management by tracking the usage of materials and equipment in real-time, ensuring that supplies are always stocked and available when needed.

2. Enhancing decision-making with real-time data

Real-time data from remote monitoring systems provide office managers with the insights needed to make informed decisions quickly and accurately.

- **Data-driven decisions:** Utilize data from sensors to identify trends and patterns in pest activity, enabling proactive measures rather than reactive ones. This leads to more effective pest control strategies and improved customer satisfaction.
- **KPI tracking:** Monitor Key Performance Indicators (KPIs) such as response times, treatment effectiveness, and technician productivity. Use these insights to make data-driven decisions that enhance overall operational efficiency.
- **Customizable dashboards:** Set up customizable dashboards that display the most relevant data for office managers. This allows for quick access to critical information, aiding in faster and more accurate decision-making.

3. Improving communication between field technicians and office staff

Effective communication between field technicians and office staff is crucial for efficient operations. Remote monitoring technology facilitates seamless communication and collaboration.

- **Real-time updates:** Ensure that field technicians and office staff are always on the same page with real-time updates from remote monitoring systems. This reduces miscommunication and ensures that everyone is working with the most current information.

- **Centralized communication hub:** Use a centralized communication platform to share data, updates, and instructions. This enhances coordination and ensures that all team members are aligned in their efforts.
- **Feedback loop:** Establish a feedback loop where field technicians can report back on the effectiveness of treatments and any on-site observations. This information can then be used to refine strategies and improve service delivery.

4. Managing alerts and incidents efficiently

Remote monitoring technology generates a wealth of data, including alerts and incident reports. Efficiently managing these alerts is essential for maintaining control over pest activity.

- **Prioritization of alerts:** Set up a system to prioritize alerts based on severity and urgency. This ensures that the most critical issues are addressed first, minimizing potential damage and customer dissatisfaction.
- **Incident tracking:** Use incident tracking tools to monitor the status of each alert from detection to resolution. This provides a clear overview of ongoing issues and helps in identifying any recurring problems that may need further attention.
- **Report generation:** Generate detailed reports on incidents and resolutions, providing valuable insights for continuous improvement. These reports can also be shared with clients to demonstrate the effectiveness of your pest control efforts.

## 5. Utilizing remote monitoring for scheduling and resource allocation

Optimizing the allocation of resources and scheduling tasks effectively are key responsibilities of a PCO office manager. Remote monitoring technology provides the data needed to excel in these areas.

- **Dynamic scheduling:** Use real-time data to dynamically adjust schedules based on current pest activity levels and technician availability. This ensures that resources are allocated efficiently and service is provided promptly.
- **Resource optimization:** Analyze data to determine the most effective use of resources, such as which areas require more frequent monitoring or which technicians are best suited for specific tasks. This maximizes productivity and reduces waste.
- **Performance analytics:** Regularly review performance analytics to identify areas for improvement in scheduling and resource allocation. Use these insights to make strategic adjustments that enhance overall efficiency.

Conclusion

Remote monitoring technology is revolutionizing the role of the PCO office manager, providing the tools and insights needed to enhance efficiency, decision-making and communication. By streamlining workflows, leveraging real-time data, improving communication, managing alerts efficiently and optimizing scheduling and resource allocation, office managers can drive significant improvements in rodent control operations.

Embrace the innovation and energy that remote monitoring brings to the table. This technology not only enhances your operational capabilities but also positions your business at the forefront of the pest control industry.
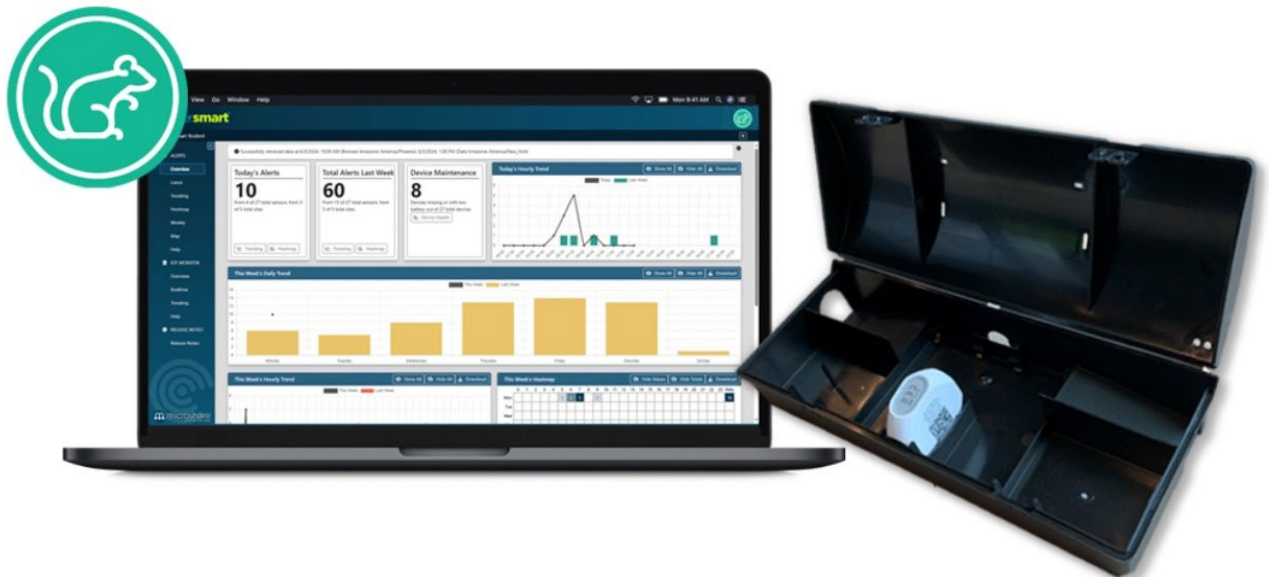
Dashboard analytics – Unlocking the power of remote monitoring data

Introduction

In the Pest Control industry, remote monitoring technology has opened up new possibilities for efficiency, accuracy, and proactive service. At the heart of this technological revolution are dashboards that transform raw data into actionable insights. For PCOs, understanding how to leverage these basic dashboard insights is crucial for optimizing operations and delivering superior service. This chapter will guide you through setting up and using basic dashboard insights to enhance your pest control business.

1. Setting up a basic dashboard

The first step in harnessing the power of remote monitoring data is setting up a dashboard that provides a clear and concise overview of key metrics.

- **Choosing the right platform:** Select a dashboard platform that is user-friendly and integrates seamlessly with your remote monitoring system. Ensure it offers the necessary features for data visualization and reporting.
- **Identifying key metrics:** Determine the most critical metrics for your operations, such as pest activity levels, sensor status, and technician response times. These metrics will form the core of your dashboard.
- **Customizing the layout:** Organize your dashboard layout to prioritize the most important information. Use widgets, charts, and graphs to present data in a visually appealing and easily digestible format.

2. Identifying key metrics for beginners

To get the most out of your dashboard, focus on key performance indicators (KPIs) that are essential for daily operations and decision-making.

- **Rodent activity levels:** Track activity across different locations to identify hotspots and trends. This helps in deploying resources more effectively and addressing issues promptly.
- **Sensor status and alerts:** Monitor the status of your sensors to ensure they are functioning correctly. Set up alerts for any malfunctions or low battery levels to maintain continuous monitoring.
- **Response times:** Measure the time taken for technicians to respond to alerts. This KPI is crucial for assessing the efficiency of your team and improving customer satisfaction.

3. Basic data visualization techniques

Effective data visualization is key to understanding and acting on the information provided by your dashboard.

- **Charts and graphs:** Use bar charts, line graphs, and pie charts to represent data trends and comparisons. These visual tools make it easier to grasp complex information quickly.
- **Heatmaps:** Implement heatmaps to show areas with high pest activity. This visual tool is particularly useful for identifying patterns and focusing efforts where they are needed most.
- **Color coding:** Apply color coding to different data points to highlight critical issues, such as red for high pest activity or sensor malfunctions, and green for normal conditions.

4. Training Staff on Basic Dashboard Use

Ensuring that your team is proficient in using the dashboard is essential for maximizing its benefits.

- **Introduction sessions:** Conduct introductory training sessions for staff, covering the basics of dashboard navigation and interpretation of key metrics.
- **Hands-on practice:** Provide opportunities for hands-on practice, allowing staff to explore the dashboard and become comfortable with its features.
- **Ongoing support:** Establish a support system where staff can ask questions and receive assistance as they learn to use the dashboard. This could include a helpdesk, online resources, and regular refresher courses.

5. Integrating basic insights into daily operations

Incorporating dashboard insights into your daily operations can lead to significant improvements in efficiency and effectiveness.

- **Daily check-Ins:** Schedule regular check-ins where the team reviews dashboard data together, discussing any notable trends or issues and planning actions accordingly.
- **Action plans:** Develop action plans based on the insights gained from the dashboard. For example, if a particular area shows high pest activity, prioritize it for treatment.
- **Continuous improvement:** Use the data to continuously assess and improve your operations. Regularly review KPIs and adjust strategies to enhance performance and service delivery.

Conclusion

Basic dashboard insights are a powerful tool for PCOs, providing a clear and actionable view of remote monitoring data. By setting up a user-friendly dashboard, focusing on key metrics, utilizing effective data visualization techniques, training staff, and integrating insights into daily operations, you can significantly enhance your pest control services.

Embrace the excitement and innovation that come with leveraging dashboard technology. This approach not only improves your operational capabilities but also positions your business at the cutting edge of the pest control industry.

Call to Action

Start your journey with dashboard insights today. Set up your basic dashboard, train your team, and integrate data-driven decision-making into your daily operations. Experience the transformative impact of remote monitoring technology and take your pest control services to new heights. The future of pest control is data-driven, and it begins with your dashboard.

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