FACILITY DATA STANDARD

ISSA Pulire Hackathon 2023

INFORMATIONAL PACKET FOR STUDENTS PARTICIPATING IN THE 2023 ISSA PULIRE HACKATHON

Disclosure: Some of the content has been generated with the assistance of ChatGPT

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FDS Tip:

The Cleaning Industry

The Buildings

- Types of Buildings:
  - Commercial janitorial companies provide essential cleaning services to a wide range of buildings, including:
    - Office Buildings
    - Educational Facilities
    - Healthcare Facilities
    - Retail Stores
    - Manufacturing Facilities
    - Government Buildings
- Spaces in the Building
  - Different spaces in a building have unique cleaning requirements that must be addressed for effective cleaning. Here are some examples:
    - Restrooms: Restrooms are one of the most critical areas to clean in any building. They require regular cleaning and disinfecting to prevent the spread of germs and maintain a hygienic environment.
    - Common Areas: Common areas such as lobbies, hallways, and elevators are often high-traffic areas that require frequent cleaning to maintain a clean and inviting environment.
    - Offices: Offices require daily cleaning to maintain a professional and hygienic workspace. This can include dusting, vacuuming, and disinfecting surfaces such as desks and chairs.
    - Kitchens and Break Rooms: Kitchens and break rooms require specialized cleaning to maintain a safe and hygienic environment for employees. This can include cleaning appliances, countertops, and floors.
    - Manufacturing Areas: Manufacturing areas requires specialized cleaning to maintain safety and efficiency. This can include cleaning and maintaining production lines, machinery, and other equipment.

It's important for janitorial companies to understand the unique cleaning requirements for each space in a building to ensure effective and efficient cleaning.

FDS Tip: By utilizing FDS, facility managers can access a comprehensive database of information on different building types, including their unique characteristics and cleaning requirements. This information can then be used to develop customized cleaning plans and ensure that cleaning activities are tailored to the specific needs of each building.

The Cleaning Industry

The tasks to Preform

- Deep cleaning tasks:
  - Deep cleaning involves thorough cleaning of a facility beyond regular daily cleaning tasks.
  - Facilities management companies may perform deep cleaning tasks on a periodic basis, such as monthly or quarterly.
  - Deep cleaning tasks may include cleaning carpets and upholstery, scrubbing floors, cleaning high-touch surfaces, and disinfecting areas with specialized equipment.
- Daily maintenance tasks:
  - Daily maintenance tasks involve routine cleaning and upkeep of a facility.
  - Facilities management companies may perform daily maintenance tasks such as cleaning restrooms, emptying trash bins, and maintaining common areas.
  - Daily maintenance tasks may also include routine maintenance and repairs of equipment and infrastructure, such as HVAC systems or plumbing.
- Incidents:
  - Facilities management companies are responsible for responding to incidents that occur within a facility, such as spills or other accidents.
  - Incidents may require immediate attention and specialized equipment or expertise to resolve.
  - Facilities management companies may also be responsible for coordinating with emergency services such as fire or police departments in the event of a more serious incident.

Overall, facilities management companies play a critical role in maintaining the cleanliness and functionality of facilities. By performing deep cleaning tasks, daily maintenance tasks, and responding to incidents, facilities management companies ensure that facilities remain safe and functional for employees, customers, and visitors.

FDS Tip: By incorporating FDS into your facility management system, you can establish a standardized process for incident reporting and track the progress of deep cleaning and maintenance tasks across your organization. FDS provides a consistent framework for categorizing incidents and tasks, making it easier to track and analyze data related to facility management.

The Cleaning Industry

Cleaning Jobs:

- Cleaning jobs within facilities management companies may include janitorial, custodial, or housekeeping roles.
- Cleaning jobs may involve routine cleaning tasks as well as more specialized tasks such as deep cleaning or disinfecting.
- Cleaning jobs may require working evenings, weekends, or holidays depending on the needs of the facility.
- Education & Training:
- Facilities management companies may provide on-the-job training for cleaning staff, as well as additional training for specialized tasks such as deep cleaning or using specialized equipment.
- Education requirements for cleaning jobs may vary, but many cleaning jobs do not require a college degree.
- Some cleaning jobs may require specific certifications, such as certification in disinfection techniques.

Promotions & Careers:

- Facilities management companies may offer opportunities for advancement within cleaning roles, such as moving from a janitorial role to a supervisory role.
- Some facilities management companies may also offer opportunities to move into other areas of the company, such as maintenance or operations.
- Cleaning jobs may also provide a steppingstone to other careers within facilities management or related industries.

A Day in the Life of a Cleaner:

- A typical day in the life of a cleaner may involve routine cleaning tasks such as vacuuming, dusting, or mopping.
- Cleaners may also be responsible for restocking supplies such as toilet paper or soap.
- Depending on the needs of the facility, cleaners may also perform more specialized tasks such as deep cleaning or disinfecting.
- Cleaners may work independently or as part of a team and may interact with other facility staff or customers on a regular basis.

FDS Tip: By incorporating FDS into your facility management system, you can establish the daily schedule of each of the cleaning team members, and you can identify the cleaning job in each space, what equipment to use, and .what supplies to bring along.

The Cleaning Industry

Types of Manual Cleaning:

- Main Areas

  In general, the two main areas of cleaning are floor surfaces and high-touch areas. Whilst floors are cleaned by using either manual equipment/tools (daily/frequently) or machines (periodically), the cleaning of high touch areas is still a job to be done by hand using e.g.: cloths and scourers
- Methods
  - Which cleaning method to apply depends on what is hygienically right for the different type of sites.
  - Significant improvements in hygiene can be achieved by implementing the correct cleaning method (e.g.: pre-prepared one mop/cloth per room area).
- Understanding the risk level of a site is a starting point
  - Higher Risk: Hotels, Bars, Restaurants, Gyms, Airports, Exhibition Centers. Large turnover of visitors, often from multiple countries and visit even if unwell.
  - Medium Risk: Education, Offices. Lower number of visitors, semi-public and therefore easier to control

It is also important to understand the main types of cleaning methods used by professional cleaners as not all methods work in every site and situation.
(see next page)

FDS Tip: By incorporating FDS into your facility management system, you can establish standardized cleaning protocols and procedures based on the level of hygiene that needs to be achieved for a specific site at a specific time.

The Cleaning Industry

Manual Cleaning Methods

Method	Process	Hygiene Level
Bucket / Bucket & Press	•Bucket of cleaning solution is made up •Cloth/mop is dipped into solution and wrung out •Cloth/mop is used to clean surface and returned to bucket •Cloth/mop used many times in different areas	•Low: Strongest risk of cross contaminating •Same cloth/mop used in many areas, passing contaminants between areas •Dirt released from cloth/mop after use into bucket contaminating cleaning solution
Spray	•Cloth/mop or surface directly sprayed with solution •Surface wiped clean •Next area sprayed and wiped clean •Cloth/mop mostly used many times in different areas (but can be clean cloth/mop per room)	•Medium: intermediate risk of cross contamination •Spray bottle ensures no dirt released into cleaning solution used in next area •Spray bottle/canister can become contaminated when emptying and refilling •Often same cloth/mop used in many areas, passing contaminants between areas
Pre- Prepared, washable	•Multiple clean cloths/mops placed into bucket and dosed with cleaning solution or only cold water •Each cloth/mop used to clean one area and then put into laundry •A clean cloth/mop used to clean the next area	•High: Very low risk of cross contamination •A clean cloth/mop used in each area •No central solution bucket •Reduced or no detergent residue at all, less risk of building a bio-film
Single Use	•Each mop or cloth moistened with detergent solution or only cold water Individually or in a batch •Each cloth/mop used to clean one area and then disposed •A clean cloth/mop used to clean the next area	•Highest: Extremely low risk of cross contamination •A clean cloth/mop used in each area •No central solution bucket •Reduced or no detergent residue at all, less risk of building a bio-film

The Cleaning Industry

Manual Cleaning Equipment

The main type of manual equipment used in the industry are:

Trolleys and carts

- Trolleys are the "workbench" for professional cleaners. They carry the respective cleaning equipment as well as supplies like paper towels etc. also serve as garbage/waste collectors. Some examples:
  - Cleaning Trolley | Vileda Professional UK Site (vileda-professional.co.uk)
  - FlexoMate cleaning trolley | Kärcher International (kaercher.com)
  - Cleaning Trolleys | IPC (ipcworldwide.com)

Floor Cleaning systems

- As all sites differ in size, floor coverings, volume of traffic, hygiene and health and safety requirements one floor cleaning system is not sufficient to meet all needs. By choosing the correct system for your requirements you can achieve better performance, ergonomics and lower overall total cost-in-use. Check out these examples:
  - Mopping Systems | Vileda Professional UK Site (vileda-professional.co.uk)
  - Manual Floor Care | IPC (ipcworldwide.com)
  - Floor - wet cleaning | Kärcher International (kaercher.com)

Wipes

- Can be differentiated between single-use wipes or re-usable/washable cloth. A variety of materials supporting the different methods. In terms of hygiene, using a quality single use microfiber cleaning product is the best option as up to 99.99% of bacteria is removed in the cleaning process and the mop/cloth is then disposed of. Cross contamination risks due to laundry logistics are excluded.
- Durable products, even if used one loth per room/task are not as hygienic as they require extra handling (storage after use, laundry, process). If these processes are not managed well hygiene levels can be affected. Outside of hygiene other factors can also affect the choice including:
- Practicalities of your site:
  - Do you have access to laundry
  - Costs: in some situations, single use can save costs
  - Type of dirt that needs to be removed.
  - Who is using the system: single use systems are easier and require no or less training
- Cleaning Cloths | Vileda Professional UK Site (vileda-professional.co.uk)
- Surface cleaning | Kärcher International (kaercher.com)

FDS Tip: FDS can help with the management of manual cleaning machines by tracking their location and stock levels in facility management systems. By incorporating FDS, you can collect and analyze data on the usage and inventory of manual cleaning machines, allowing you to optimize operations and ensure that machines are in the right place at the right time.

The Cleaning Industry

Non-Mechanical Cleaning Supplies

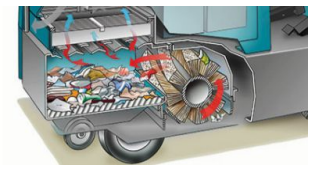
- Scourers
- From non-scratch to heavy duty, scourers are available in a variety abrasiveness grades for every cleaning job. See here:
  - Cleaning Scourer | Vileda Professional Export Site (vileda-professional.com)
  - 3M Scrubbing Pads & Sponges | 3M United Kingdom

- Protective (Gloves)
- From hand protection against bacteria, fungi, and viruses to washing up the dishes — cleaning gloves protect the skin against diluted chemicals, liquids, and detergents. Available as reusable or disposable version. Either latex-or nitrile-based to avoid skin irritation.
  - Cleaning Gloves | Vileda Professional Export Site (vileda-professional.com)
  - Safety Gloves & Hand Protection - Protective Equipment | MAPA Professional (mapa-pro.co.uk)

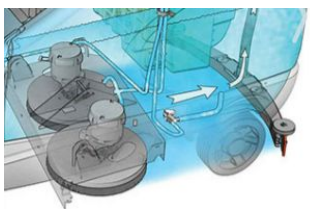
FDS Tip: By incorporating FDS into your system, you can collect and analyze data on the usage and inventory of cleaning supplies, allowing you to optimize operations and reduce waste.

The Cleaning Industry

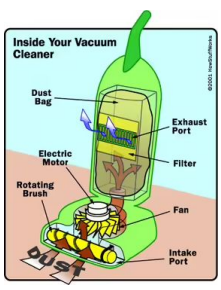
- Cleaning Machines
  - Dedicated equipment to remove dirt, debris, dust, liquids from surfaces
  - The main type of equipment used in the industry are
    - Sweeper
      - collects loose debris, such as dust, dirt, and small particles using a rotating brush



    - Scrubber
      - cleans floors by dispensing water onto the floor to loosen and dissolve dirt, using rotating scrubbing brushes or pads to agitate and remove dirt and other debris from the floor, and removing the water using a squeegee and suction fan to leave the floor dry



    - Vacuum cleaner
      - removes dust and other debris from floors using suction generated by a motorized fan or impeller that creates a vacuum inside the unit, pulling in air and debris through a nozzle or brush head



  - Each equipment is adapted to a specific task and environment

	Dirt	Debris	Dust	Liquid
Hard floor- Open space (Ex. University Hallway)	Scrubber	Sweeper	Scrubber	Scrubber
Hard floor- Small Space (Ex. Public Restroom)	Scrubber	Sweeper	Scrubber	Scrubber
Carpet – Open Space (Ex. Airport)	Sweeper	Sweeper	Sweeper	Vacuum
Carpet – Small Space (Ex. Hotel Room)	Vacuum	Vacuum	Vacuum	Vacuum
Stairs	Vacuum	Vacuum	Vacuum	Vacuum

The Cleaning Industry

Cleaning Machines

- There are many providers of cleaning machines that target specific markets. Some of the main providers include
  - Sweeper
    - https://www.tennantco.com/en_ca/1/machines/sweepers.html
    - https://www.kaercher.com/us/professional/floor-sweepers.html
    - https://www.nilfisk.com/en-us/products/floor-cleaning/sweepers/
  - Scrubber
    - https://www.tennantco.com/en_ca/1/machines/scrubbers.html
    - https://www.kaercher.com/us/professional/floor-scrubbers.html
    - https://www.nilfisk.com/en-us/products/floor-cleaning/scrubbers/
  - Vacuum cleaner
    - https://www.tennantco.com/en_ca/1/machines/vacuums.html
    - https://www.kaercher.com/us/professional/commercial-vacuums.html
    - https://www.nilfisk.com/en-us/products/vacuum-cleaners/

FDS Tip: By incorporating FDS into your system, you can collect and analyze data on cleaning machine usage and performance, allowing you to optimize operations and identify potential issues before they become more serious.

The Cleaning Industry

Operating model

- Cleaning companies may use different operating models to provide their services. Here are some common examples:
- In-House Cleaning: In-house cleaning involves businesses hiring and managing their own cleaning staff to perform the cleaning services. This model allows for more control over the cleaning process and may be more cost-effective for larger organizations.
- Outsourced Cleaning: Outsourced cleaning refers to businesses hiring a third-party provider to contract the external staff for all or some of their cleaning needs. This can help reduce costs, improve service quality, and free up internal resources for other business priorities.
- BSC (Building Service Contractor): BSCs are companies that specialize in providing a variety of cleaning services to multiple clients. They employ their own cleaning staff and manage all aspects of the cleaning process, including training, scheduling, and quality control.

BSC vs. Outsourcing: What's the Difference?

- The key difference between BSC and outsourcing is who is responsible for managing the cleaning staff and process. With a BSC, the cleaning company is responsible for managing everything related to the cleaning services, while with outsourcing, the hiring company (end user) is responsible for managing the processes and staff provided by the third-party provider.
- Choosing between BSC and outsourcing depends on a variety of factors, including the size and complexity of the cleaning needs, the available resources, and the desired level of control over the cleaning process.

FDS Tip: Incorporating FDS into your facility management system can help you manage employees and tasks, both for your own sites and outsourced ones. FDS provides a standardized framework for tracking performance metrics and categorizing tasks, allowing you to develop customized work plans and ensure consistency across your organization.

SOW

Here's an example of a SOW for a janitorial company servicing a large commercial building:

Scope of Work:

- Provide daily janitorial services for a large commercial building, including but not limited to cleaning and disinfecting floors, restrooms, common areas, and other designated areas.
- The cleaning schedule will be from Monday to Friday, from 6:00 PM to 2:00 AM.
- All cleaning staff must be trained and qualified to perform the required tasks and must comply with all safety and health guidelines.
- The janitorial company must provide all necessary equipment and supplies, including cleaning products, mops, buckets, and trash bags.
- The janitorial company must comply with all security and access procedures established by the building management.

Deliverables:

- A daily cleaning log detailing all tasks performed, supplies used, and any issues or incidents.
- A monthly report summarizing the performance of the janitorial services, including any suggested improvements or changes.

Timeline:

- The janitorial services will start on July 1st, 2023.
- The contract will be for a one-year period, renewable upon satisfactory performance.

By creating a detailed SOW for a janitorial company servicing a large commercial building, all stakeholders involved can have a clear understanding of the scope of work, project timelines, and deliverables. This helps to ensure that the project is completed on time and meets all the necessary requirements and can also serve as a useful tool for communicating the scope of work to the building's occupants and management.

FDS Tip: By incorporating FDS into their system, organizations can use standardized language and data collection methods to streamline the development of Statement of Work (SOW) documents. This helps ensure consistency and accuracy, improving the quality of their facility management services.

Corporate Headquarters Statement of Work (SOW)

Corporate Offices – Cleaning Specifications

Frequency	ADMINSTIATION OFFICES - GENERAL OFFICE CLEANING: MONDAY- FRIDAY
Once Per 24 Hours	Dust office equipment
Once Per 24 Hours	Clean desktops
Once Per 24 Hours	Clean counter tops
Once Per 24 Hours	Empty trash containers maintaining clean liners
Once Per 24 Hours	Clean, disinfect and dry polish wafer fountains
Once Per 24 Hours	Report burned out lights
Once Per Week	Dust wall mounted pictures and bric-a-brac
Once Per Week	Clean and disinfect telephones
Once Per Week	Dust ledges, Door jambs and windowsills
Once Per Week	Clean doorjambs and light switch covers
Once Per Week	Check for and remove cobwebs
Once Per Week	Clean all leather office chairs
Once Per Week	Clean walls
Once Per Month	Brush wall registers/vents
Once Per Month	Clean light covers

Frequency	OFFICE - WINDOW & GLASS CLEANING: MONDAY - FRIDAY
Once Per Week	Clean Interior windows for smudges
Once Per Week	Wash partition glass

Frequency	OFFICES - FLOOR MAINTENANCE -TILED AREAS: MONDAY- FRIDAY
Once Per 24 Hours	Dust mop floors
Once Per 24 Hours	Spot Mop floors as needed
Once Per Week	Full mop all floors
Once Per Week	Burnish main halls
Once Per Month	Top scrub main halls and top coat as needed
Once Per Month	Machine scrub main break room as needed

Frequency	OFFICES: OTHER MAINTENANCE
Twice Per Year	Top scrub and re-coat all surfaces
Twice Per Year	Wash carpet
Once Per Year	Strip and reseal all surfaces
NOTE:	All floors are to be maintained in a professional manner to maintain o high gloss shine appropriate to the area i.e. main hall floors will require a high gloss shine whereas labs and offices will be free of oil, dirt, debris, soiling, stains, etc.

Frequency	BREAK AREAS: MONDAY- FRIDAY
Once Per 24 Hours	Clean break Areas as per the following specifications
Once Per 24 Hours	Clean and disinfect sinks and counter tops
Once Per 24 Hours	Empty trash containers
Once Per 24 Hours	Clean outside of trash containers
Once Per 24 Hours	Sweep floors
Once Per 24 Hours	Mop floors
Once Per 24 Hours	Wash glass
Once Per 24 Hours	Clean microwaves
Once Per 24 Hours	Restock towels and hands soap

Frequency	RESTROOMS & LOCKER ROOMS: MONDAY - FRIDAY
Once Per 24 Hours	Empty trash containers
Once Per 24 Hours	Empty and clean sanitary napkin waste containers
Once Per 24 Hours	Clean and dry polish mirrors
Once Per 24 Hours	Clean dispensers
Once Per 24 Hours	Clean and disinfect sinks, commodes. and urinals
Once Per 24 Hours	Clean walls and partitions
Once Per 24 Hours	Clean outside of trash containers
Once Per 24 Hours	Restock tissue, towels, and hand soaps
Once Per 24 Hours	Restock sanitary napkins and tampons
Once Per 24 Hours	Maintain and restock aerosol dispensers
Once Per 24 Hours	Sweep floors
Once Per 24 Hours	Mop floors With germicidal Cleaner
Once Per 24 Hours	Report malfunctions 1n restrooms to maintenance personnel

Frequency	POLICE: MONDAY - FRIDAY
Once Per 24 Hours	Clean dispensers
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Once Per 24 Hours	Clean walls and partitions
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Once Per 24 Hours	Restock tissue, towels, and hand soaps
Once Per 24 Hours	Restock sanitary napkins and tampons
Once Per 24 Hours	Maintain and restock aerosol dispensers
Once Per 24 Hours	Sweep floors
Once Per 24 Hours	Mop floors With germicidal Cleaner
Once Per 24 Hours	Report malfunctions 1n restrooms to maintenance personnel

Day Porter

Scope of Job

The primary function of this position is to provide the specialized services for required Maintenance/Janitorial duties required to Maintain the superior housekeeping and showcase atmosphere of the Corporate HQ and Tire Testing Department.

Duties Include:

Monday-Wednesday-Friday

Sweeping of all department floors including:

- Tire analysis area
- Inventory area
- Tire Prep area
- Testing Offices and Staff Room
- Testing Offices and Staff Room

Other Duties

- Vacuuming of all throw rugs
- Emptying of all trash receptacles
- General cleaning of staff room
- Run walk behind door scrubber in all accessible areas
- Mop remaining areas not accessible with the walk behind floor scrubber
- Remove tire marks from floors with solvent or equivalent cleaners or pads
- Cleaning test wheel room windows
- Sweep and clean out test wheel rooms when access is available
- General cleaning of unisex bathroom In Tire Testing
- Other duties as required.
- Clean spills, etc.
- Clean lobby door glass as needed
- Change fluorescent lamps and other light bulbs and light ballasts as needed
- Assist In keeping entryway free of snow and ice
- Inspect grounds around office buildings and cafe dock area tor trash
- Assist office service personnel with other related functions
- Keep hallways and stairwells free of litter and any trip and slip hazards
- Check mechanical rooms for litter and clean when needed
- Assist night housekeeping crew if needed in cafe before leaving for the day
- Advise proper point of contact (facilities buyer) of *any* equipment or building conditions that require repair or any un-safe Conditions
- May be required to perform other jobs not listed above between routine duties throughout the day
- Installing soap dispensers

Routine Daily Duties

A. Sweep Mailroom and empty waste paper baskets

A2. Empty waste baskets and wipe al tables and counters

B. Clean sweep and dump trash in designated executive offices and general cleaning as needed in all executive offices.

C. Check all Restrooms daily

1. Restock paper towels and toilet paper if needed
2. Wipe down sinks, clean toilets, and empty waste baskets. If needed.
3. Fill ladies dispensers as needed
4. Check soap dispenser refills if needed
5. Spot clean if needed

D. Collect and shred paper rom pre designated areas for security reasons

E. Check janitorial closets

- Clean as needed
- Stock supply shelves as needed

F. Lobby and Other Entry Areas

- Pick up litter
- Mop floors as needed during wet and other adverse weather conditions as needed
- Vacuum area rugs as needed

Technology in Facilities

Sensors

- Facility management companies use various types of sensors to monitor and control different aspects of building operations.
- Temperature sensors are used to measure the temperature of different zones within a building and can be used to regulate HVAC systems for better energy efficiency.
- Humidity sensors measure the moisture content in the air and can help prevent mold growth or other moisture-related issues.
- Air quality sensors measure the concentration of pollutants in the air, such as carbon monoxide, and can help ensure a healthy indoor environment.
- Occupancy sensors detect the presence or absence of people in a room or area and can be used to optimize energy usage by turning lights or HVAC systems on or off accordingly.
- Light sensors measure the amount of natural and artificial light in a space and can be used to adjust lighting levels for energy savings or to optimize the indoor environment.
- Water sensors can detect leaks or moisture in different areas of a building and can help prevent water damage or mold growth.
- Motion sensors can detect movement in different areas of a building and can be used for security purposes or to trigger alerts when there is unexpected activity.
- Sound sensors can detect noise levels and can be used to optimize acoustics in different areas of a building, such as conference rooms or performance spaces.

- Perception Sensors: Used to detect physical stimuli and the presence/movement of people or objects, and to monitor environmental conditions.
- Environmental Sensors: Used to monitor physical conditions and identify areas requiring attention, as well as to monitor equipment and infrastructure.
- Activity Sensors: Used to monitor behavior/activity of people, track movement patterns, and optimize facility operations.

FDS Tip: Sensors and FDS work together to provide a consistent and efficient approach to collecting and analyzing data on facility conditions. FDS helps organize sensor data and provides a standardized language for describing building and asset types, leading to better decision-making and facility management.

Technology in Facilities

Internet of Things and telemetry

- The Internet of Things (IoT), refers to the network of physical objects, devices, and sensors that are embedded with internet connectivity, allowing them to communicate and exchange data with each other and with the internet.
- Main advantages and outcome :
  - A real-time view on all production processes
  - Optimization of time, and therefore of expenses;
  - Improved productivity;
  - Improved decision making;
  - The ability to generate more revenue.

Now, let's take a closer look at how IoT works:

- Data Collection: IoT devices collect data from the environment through their sensors. For example, a smart thermostat might measure the temperature and humidity in a room.
- Data Transmission: Once data is collected, it is transmitted to other devices or to the cloud using wireless communication protocols. For example, a smart home security system might use Wi-Fi to transmit data from its cameras to a cloud service.
- Data Processing and Analysis: The data collected by IoT devices is processed and analyzed in the cloud. This may involve filtering out irrelevant data, identifying patterns, and making predictions based on the data collected.
- Data Storage: The data collected by IoT devices is stored in the cloud, where it can be accessed and analyzed as needed.
- Action: Based on the data collected and analyzed, a human or an IoT devices can act. For example, a smart thermostat might adjust the temperature based on the time of day and the occupancy of a room. Or a human can use the data collected and analyzed to adjust the temperature manually.

FDS Tip: By incorporating FDS into your system, you can establish a standardized approach for collecting and analyzing data from different IoT devices. By utilizing FDS to manage IoT devices in facility management systems, facility management professionals can improve their ability to monitor and optimize facility operations, reducing downtime and improving overall productivity.

Technology in Facilities

IoT : Radiocommunications, Cloud Services and Software

- Connectivity is the means by which IoT devices communicate with each other and with the internet. This is typically achieved through wireless communication protocols such as Wi-Fi, Bluetooth, LoRaWan, Sigfox, or cellular networks (2G, 3G, 4G, 5G). Some IoT devices may also use wired connections such as Ethernet.
- Radiocommunication infrastructures plays a critical role in IoT by enabling wireless connectivity between devices. This infrastructure can be deployed on a specific building, using "Gateways", or operated by a telecommunication company such as Vodafone or Telecom Italia.

There are several software components that are commonly used in the IoT industry. Here are some examples:

- Firmware and Middleware : IoT devices require an embedded software allowing to collect, process and send data. Theses software are mainly run by the microcontroller, which is basically the brain of the device. The goal here is to save as much power as possible allowing the device to run on batteries as long as possible (a few years...)
- Cloud Services: Cloud services are used to store and process the massive amount of data collected by IoT devices. This includes data processing, storage, and analysis. Cloud services may also provide additional functionality, such as machine learning algorithms that can help make sense of the data collected by IoT devices. Some of the most popular cloud services include AWS, Microsoft Azure and Google Cloud.
- Analytics Tools: Analytics tools are used to process and make sense of the data collected by IoT devices. These tools can range from simple dashboards that provide real-time monitoring of device data, to more complex tools that use machine learning and other techniques to identify patterns and make predictions. End users can usually access these tools through a Software as a Service Platform.

Example of Gateway

FDS Tip: By incorporating FDS into your system, you can establish a standardized approach for collecting and analyzing data from different sources. FDS provides a framework for categorizing different types of data and tracking performance metrics, which can be used to develop an integrated platform that supports seamless data sharing and interoperability.

Technology in Facilities

Smart buildings

- Smart buildings are structures that use advanced technology and automation to optimize various functions such as energy management, lighting, air conditioning, heating, security, and communication systems. These buildings use sensors, Internet of Things (IoT) devices, and other connected technologies to gather data and provide real-time information that can be used to adjust and optimize the building's systems.
- Smart buildings are managed using a variety of technologies and processes that enable building managers to monitor and control various building systems remotely. Here are some common ways that smart buildings are managed:
    - Building Management Systems (BMS): A BMS is a centralized computer-based system that monitors and controls various building systems, such as HVAC, lighting, security, and access control. It uses sensors, controllers, and other devices to gather data and automate building operations, such as adjusting temperature and lighting levels based on occupancy or time of day.
    - Artificial Intelligence (AI) and Machine Learning: Smart buildings can use AI and machine learning algorithms to analyze data and make predictions about building performance. This information can be used to optimize building systems, reduce energy consumption, and improve occupant comfort.
    - Building automation service providers: Building automation service providers offer a range of services to help building owners and managers manage their smart buildings. These services may include system installation, maintenance, and monitoring, as well as consulting and data analysis.

FDS Tip: Incorporating FDS into your facility management system can help the management of smart buildings by aggregating the information needed by a BMS or providing the data layer of an AI system

Technology in Facilities

Software applications

- Many systems can be connected these days. As per the previous slide, Smart Buildings are helping reduce costs while provide better services to customers. To do this, software is required. Software to connect sensors to the cloud, and to a middleware or data platform, then connecting this data to an end user. Whether that is a team on the ground, or a manager helping review what is going on out in the field.

- Software is a key connector and is what is helping transform and disrupt many industries. It is also helping transform the cleaning industry. Connected devices, letting teams and or users know there is requirement to refill liquids, or the unit itself has detected an anomaly, sending an alert to one place or multiple places requires software and data.

- Software also helps with workflows. Just having an alert or data is only part of the process to help improve operations and increase efficiencies. Taking the data and sending it to workflow systems like ServiceNow or Dynamics is the next step to the process. Software connecting to software to help operatives is the future and what is required to enable a connected facilities and cleaning solution.

FDS Tip: By utilizing FDS to streamline multiple software applications into one open-source API, facility management professionals can improve their ability to manage and optimize facility operations, reducing the need for manual data entry and enabling more efficient data sharing and analysis.

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ESG

ESG stands for Environmental, Social, and Governance, and is a set of criteria used to assess a company's performance in these three areas. ESG has become an increasingly important consideration for investors and stakeholders who want to ensure that companies are operating sustainably and ethically. Here are some key points about ESG:

- Environmental:
  - Refers to a company's impact on the environment, including its carbon footprint, waste management, and resource usage.
  - ESG metrics related to the environment might include greenhouse gas emissions, energy efficiency, water usage, and waste reduction targets.
  - Companies that perform well on environmental metrics are often those that are actively working to reduce their impact on the environment through sustainable practices and initiatives.
- Social:
  - Refers to a company's impact on society, including its treatment of employees, community engagement, and relationships with customers and suppliers.
  - ESG metrics related to social issues might include diversity and inclusion policies, labor practices, human rights, and community investment.
  - Companies that perform well on social metrics are often those that prioritize stakeholder engagement and are committed to being a positive force in their communities.
- Governance:
  - Refers to a company's internal policies and practices, including its management structure, board composition, and ethical standards.
  - ESG metrics related to governance might include executive compensation, board independence, shareholder rights, and codes of conduct.
  - Companies that perform well on governance metrics are often those that prioritize transparency and accountability and have a strong ethical culture that is reflected in their decision-making processes.
- Benefits of ESG:
  - ESG can help companies identify areas for improvement and implement best practices that drive positive impact and stakeholder value.
  - ESG can help companies manage risk and ensure long-term sustainability, while also improving brand reputation and stakeholder trust.

FDS Tip: FDS can help with implementing and reporting ESG goals by standardizing environmental, social, and governance data collection, analysis, and reporting, facilitating real-time data monitoring, improving collaboration and communication, and supporting risk management.

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Technology Impact on Cleaning Processes

Digitalization technology has enabled the development of more advanced and efficient cleaning equipment that can help cleaning professionals to work more effectively and efficiently. Here are some ways in which digitalization technology has affected cleaning equipment:

- Data collection and analysis:
  - Digitalization technology has made it possible to collect and analyze data on cleaning performance, such as the time taken to clean a space, the energy consumption, and the sequence of tasks. This data can be used to optimize cleaning operations, reduce costs, and improve the overall efficiency of cleaning equipment.
- Automation:
  - Technology has enabled the development of autonomous cleaning machines that can operate without human intervention. These machines are equipped with sensors that enable them to navigate and clean indoor and outdoor spaces.
- Remote monitoring and control:
  - Digitalization enables cleaning professionals to monitor cleaning operations in real-time and adjust as needed, improving efficiency and reducing downtime.
- Predictive maintenance:
  - Digitalization technology can also be used to monitor the health and status of cleaning equipment and predict when maintenance, refill, or repairs will be needed.

FDS Tip: FDS provides a framework for categorizing equipment types and tracking performance metrics, which can be used to develop predictive maintenance strategies and optimize equipment usage. FDS can also facilitate automation and remote monitoring of smart cleaning equipment, providing real-time data and insights.

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- Planning:
  - Computer programs and algorithms enable the creation of detailed cleaning schedules that consider variables such as foot traffic and room usage.
  - Planning software can optimize cleaning schedules for efficiency, saving time and resources.
  - Predictive analytics can be used to anticipate when certain areas will require additional cleaning attention.
- Reporting:
  - Data can be analyzed to identify areas that require additional attention or where improvements can be made.
  - Performance of cleaning staff can be monitored and tracked.
- Execution:
  - Automated cleaning equipment, such as robotic vacuums and floor scrubbers, can clean large areas quickly and efficiently.
  - Cleaning equipment can be programmed to work during off-hours, reducing the disruption to regular business operations.
  - The use of technology can help ensure consistency in the cleaning process, reducing the risk of errors or oversights.

Overall, the impact of technology on cleaning processes has been significant, enabling professionals to work more efficiently and effectively. With continued advancements in technology, it is likely that cleaning processes will become even more streamlined and effective in the future.

FDS Tip: By incorporating FDS into your facility management system, you can establish a standardized approach for collecting and analyzing data related to technology usage and performance. Providing a framework for categorizing different types of technology assets and tracking performance metrics, which can be used to identify areas for improvement and optimize operations.