

MONTEFIORE ENTERPRISE ASSET MANAGEMENT | WHITEPAPER

Optimizing Healthcare Infrastructure Through Enterprise Asset Management (EAM)

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Montefiore Einstein

Executive Summary

EAM systems are not just repositories of information but strategic tools guiding continuous improvement and organizational resilience.

Managing a hospital system's assets is critical to ensuring it can deliver high-quality care, control costs, and operate efficiently. Integrating an enterprise asset management (EAM) system significantly enhances operational excellence by providing comprehensive visibility, control, and proactive management of assets. EAM systems are not just repositories of information but strategic tools that guide continuous improvement and organizational resilience.

EAM systems manage maintenance schedules, auto-generate work orders for repairs, track usage, and provide data to inform decisions on new purchases or allocation of underused equipment. They also monitor compliance by ensuring all equipment meets regulatory standards and that proper documentation is available. Predictive maintenance with asset management can help hospital systems lengthen the lifespan of their assets and save significant capital expenses over time.

Mismanaged assets can lead to significant challenges, including patient safety risks, operational inefficiencies, financial losses, regulatory compliance issues, and reduced staff productivity. Faulty equipment can cause treatment delays, incorrect diagnoses, and other critical issues. Aging equipment without preventive maintenance can lead to unplanned downtime and unavailability, while uncertain asset utilization can result in overstocking or stockouts.



Implementing an EAM system offers numerous benefits:

- ▶ **Improved asset reliability and uptime.**
Preventive maintenance schedules and real-time monitoring enhance equipment reliability and availability.
- ▶ **Enhanced compliance and audit readiness.**
Automated documentation and reporting streamline audit preparation and ensure regulatory compliance.
- ▶ **Cost control through lifecycle management.**
Data-driven decision-making on repairing, replacing, and retiring assets minimizes unnecessary expenses.
- ▶ **Streamlined operations and workforce productivity.**
Real-time asset tracking and automated alerts improve workflow and staff efficiency.
- ▶ **Sustainability and energy efficiency tracking.**
Monitoring energy consumption supports sustainability goals and identifies opportunities for maintenance or upgrades.

Montefiore Einstein, a premier academic health system, faced operational challenges due to the use of 38 disparate EAM systems.

Montefiore Einstein, a premier academic health system, faced operational challenges due to the use of 38 disparate EAM systems. By unifying these systems with a cloud-based enterprise asset management system and a space management program, Montefiore Einstein achieved significant improvements. The digital transformation involved extensive data migration, standardization, and integration, resulting in increased data accuracy, reduced costs, improved regulatory compliance, and enhanced operational efficiency.

The future of EAM in healthcare includes artificial intelligence (AI) and machine learning for predictive maintenance, mobile and cloud-based EAM platforms, integration with smart building technologies, and enhanced cybersecurity and data governance. These advancements will further optimize asset management, reduce operational costs, and improve patient care.



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Introduction

EAM tracks, maintains, and analyzes assets to optimize their performance, reduce costs, and ensure regulatory compliance.

Objectives of This White Paper

This paper aims to outline the current landscape of healthcare systems and provide a forward-thinking look at how enterprise asset management (EAM) creates significant value. We will take a deep dive into what EAM is, alongside its benefits and future opportunities. We will also share a case study of the recent work completed at Montefiore Einstein to implement a unified space and asset management program—the first of its kind in the regional healthcare area. This white paper is intended to spark discussion and demonstrate how EAM can enable hospitals seeking to use systems to manage regulatory compliance and strengthen operational efficiencies.

Definition of Enterprise Asset Management

Enterprise asset management (EAM) is the systematic management of physical assets for a hospital system throughout their lifecycle. It includes medical equipment, information technology (IT) equipment, facilities, and infrastructure. As both a tool and a process, EAM tracks, maintains, and analyzes assets to optimize their performance, reduce costs, and ensure regulatory compliance.

EAM begins by creating a detailed inventory of all assets such as magnetic resonance imaging (MRI) machines; hospital beds; heating, ventilation, and air conditioning (HVAC) systems; and infrastructure. Then a unique code is assigned to each asset for identification and tracking throughout its lifecycle. As portable assets are moved throughout the facilities, their status and condition are continuously updated through scanning devices and RFID or real-time location service readers.

An EAM system manages maintenance schedules and auto-generates work orders for maintenance and repairs. It tracks usage and provides data to inform decisions on new purchases or allocation of underused equipment. It also monitors compliance by ensuring that all equipment meets regulatory standards and that proper documentation is available.



Predictive maintenance with asset management can help hospital systems lengthen the lifespan of their assets and save significant capital expenses over time. By monitoring all equipment, upkeep, location, and life expectancy, asset management helps hospital systems get the most out of their assets with as little capital expenditure as possible.

The Healthcare Facilities Landscape

Many of us think about the clinical aspects of healthcare such as doctors, nurses, and insurance processes. Not many of us regularly consider the infrastructure required to maintain high-quality, safe, and effective healthcare. A hospital system includes buildings and critical systems such as HVAC, plumbing, and IT networks. It also includes all the medical devices that are networked with the system. The healthcare system in the United States encompasses over 5,600 hospitals and nearly a million patient beds.¹ Worldwide, the total number of hospitals is expected to reach 166,548 by 2029 according to a report by Statista,² with an average of 10 to 15 medical devices per hospital bed. These data suggest that by 2029 there will be 1.67 million medical devices worldwide.³

As management of additional new lifesaving devices continues to grow, managing a hospital's facilities can often affect the patient experience. Outdated medical equipment, unreliable power systems, inaccurate temperature controls, faulty ventilation, and poor maintenance can lead to an uncomfortable environment, delayed treatments, increased risk of infection, disrupted care, and frustration for patients and caregivers.

To maintain consistent standards across facilities and to improve the patient experience, healthcare systems are seeking to modernize and digitize.

Healthcare facilities operate under intense regulatory scrutiny because of their impact on patient safety and public health. As a result, healthcare facilities are subject to oversight by regulatory and accreditation bodies that encompass a variety of domains such as patient safety, quality of care, privacy, data security, billing fraud/abuse, and workplace safety. For EAM, two of the major accreditation and regulatory bodies are The Joint Commission and the Centers for Medicare and Medicaid Services' Conditions of Participation.



+5,600

Hospitals in the
United States



166,548

Expected total number of
hospitals worldwide by 2029



~1M

Patient beds
in the United States

10 to 15

Medical devices per hospital bed

1.67M

Medical devices worldwide by 2029

EAM software offers solutions by automating maintenance schedules, tracking asset histories, and integrating predictive analytics through AI and the Internet of Things (IoT).

The Joint Commission ensures structural, staffing, and operational standards are adhered to, and the Centers for Medicare and Medicaid Services' Conditions of Participation contain mandatory health and safety standards that healthcare entities must meet to participate in Medicare and Medicaid. Noncompliance with Joint Commission standards or Centers for Medicare and Medicaid Services' Conditions of Participation can lead to loss of accreditation and Medicare/Medicaid funding, causing severe financial and operational disruptions. It also increases patient safety risks, damages the health system's reputation, and exposes the organization to legal and regulatory consequences. Maintaining compliance, responding to deficiencies swiftly, and preserving accreditation are therefore critical to both operational viability and quality care delivery.

In 2025, The Joint Commission announced a major overhaul of its standards, consolidating the Environment of Care and Life Safety chapters into a unified "Physical Environment" section.⁴ This restructuring reduced the number of performance elements by nearly half, aiming to simplify compliance and maintain patient safety and quality care while aligning more closely with the Centers for Medicare and Medicaid Services' Conditions of Participation. Despite the reduction in standards, facilities must still meet rigorous requirements, including those derived from National Fire Protection Association (NFPA) codes and standards and Centers for Medicare and Medicaid Services' Conditions of Participation survey protocols. These changes demand proactive adaptation from healthcare organizations to maintain accreditation and avoid penalties.

Managing healthcare assets, from MRI machines to HVAC systems, is a critical yet complex task. Facilities must ensure that equipment is available, functional, and compliant with safety standards. However, many still rely on outdated methods like paper, spreadsheets, and phone calls, which increase the risk of compliance failures and operational inefficiencies.⁵ EAM software offers solutions by automating maintenance schedules, tracking asset histories, and integrating predictive analytics through AI and the Internet of Things (IoT). These tools help facilities shift from reactive to proactive maintenance, optimize capital planning, and enhance resilience against disruptions. Yet, adoption remains uneven, and financial constraints often limit access to advanced technologies.

Complementing EAM software, space information is a key asset for hospital systems and remains at a high expense across the industry.⁶ Hospital systems that are not properly managing their spaces are unable to access cost-saving benefits (for example, maintaining square footage calculations for reimbursements from Medicaid or Medicare).

Healthcare organizations are at a critical point where they must advance digitally and securely. To remain competitive and relevant in the industry, hospital systems and healthcare providers must incorporate digital methods and efficiencies into their core operations to provide the best quality care to patients. Compliance with industry regulations must also continue to be met, ensuring that operations are positioned to deliver smarter, safer patient care.

Core Components of EAM Systems

Asset Inventory and Classification

EAM systems serve as the foundation of operational excellence, enabling organizations to manage physical assets with precision, foresight, and accountability. Through EAM systems, organizations can manage the holistic lifecycle of an asset, including capital planning, acquisition, commission, deployment, maintenance, rehabilitation, compliance, and disposal. At the heart of any robust EAM framework lies a comprehensive asset inventory and classification system. This foundational layer ensures that every asset whether fixed, mobile, or digital is cataloged, tagged, and contextualized within the organization's operational landscape.⁷ Accurate classification not only supports lifecycle tracking but also informs budgeting, compliance, and strategic planning.⁸

At the heart of any robust EAM framework lies a comprehensive asset inventory and classification system.

Maintenance Management

Maintenance management is another critical pillar, encompassing both preventive and predictive methodologies. In preventive maintenance, routine interventions are scheduled to minimize downtime and extend asset life, while predictive maintenance leverages data and analytics to anticipate asset failures to inform maintenance schedules.⁹ Together, these approaches reduce reactive work, optimize resource allocation, and elevate safety standards across facilities.¹⁰ When embedded within a unified EAM system, maintenance protocols become more data-driven and aligned with long-term performance goals.¹¹





Work Order and Service Request Tracking

Work order and service request tracking support the operational and daily workflows of EAM systems. These aspects of an EAM system streamline the intake, assignment, execution, and closure of tasks, ensuring transparency and accountability at every stage.¹² Whether initiated by frontline staff or automated through system triggers, service requests are routed efficiently, tracked in real time, and analyzed. This improves response times and empowers teams to identify recurring issues, refine workflows, and enhance user satisfaction.¹¹

Integration

Integration capabilities elevate EAM systems from functional to transformative. Seamless connectivity with EAM, BIM (building information modeling), and IoT platforms enables multidimensional view of assets combining spatial intelligence, real-time monitoring, and historical data.¹³ These integrations break down silos, foster cross-functional collaboration, and unlock new opportunities for innovation in asset utilization and facility management.¹⁴

Reporting and Analytics

Finally, reporting and analytics capabilities enable teams to track trends across the asset management lifecycle. Dashboards, key performance indicators (KPIs), and custom reports translate operational data into actionable insights. Whether tracking asset performance, maintenance costs, or compliance metrics, these important elements of EAM operations support data-informed decision-making at every level of the organization.¹³ With the right analytics engine, EAM systems become not just a repository of information, but a strategic compass guiding continuous improvement and organizational resilience.¹⁴

Case Study from Montefiore Einstein Health System

Opportunity

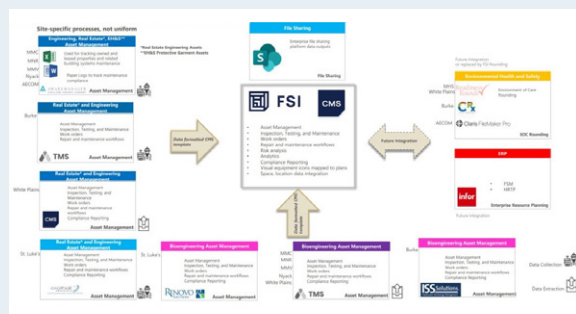
Montefiore Einstein, a premier academic health system serving communities across the Bronx, Westchester, Hudson Valley, and the broader New York metropolitan region, faced challenges achieving operational excellence due to its use of 38 disparate EAM systems across its 13 locations (12 hospitals and 1 university). An inventory of the facilities' assets did not exist for the health system. Some departments and locations maintained paper-based records, while others used various tools such as Microsoft Excel or other computer systems. For example, in the engineering department at the Moses Campus, 2,000 sheets of paper were previously distributed to technicians and staff members each month to complete work orders and facility maintenance. A system-wide inventory of the facilities' assets did not exist for the health system. Manual processes were used to record work order completion, and substantial effort was spent on locating assets, as well as preparing documentation for regulatory reporting. In most cases, clinical personnel would call the department to request maintenance or service. In addition, leadership did not have real-time data for informed decision-making. The disconnection and inaccuracies of this fragmented approach hampered the health system's ability to provide accurate asset counts, real-time management of assets, replacement based on end-of-life, and timely digital reporting for its leadership, office, and clinical personnel.

It was clear there was an opportunity to strategically unify these disparate EAM processes and systems to improve the health system's facilities operations.

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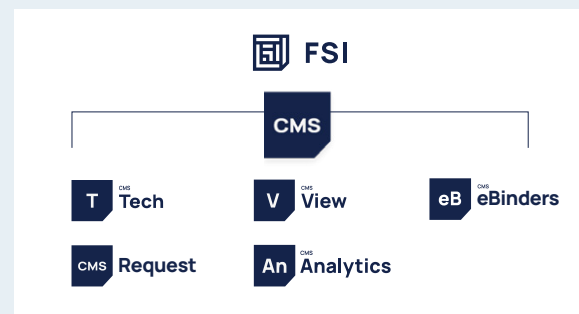
Before

Disparate, disconnected asset management systems across entities



Now

Single, standard, integrated business process and technology solution across all Montefiore healthcare entities



Starfish

CMS enables digital and mobile management of asset information, even when internet access is unavailable.

Solution

After careful consideration and benchmarking of EAM tools used by Montefiore Einstein, the enterprise selected a cloud-based tool called CMS (Customized Maintenance Solution) by the technology vendor FSI. CMS streamlines asset management processes, enabling Montefiore Einstein with a single source of truth for engineering, clinical engineering, radiation safety, and fleet assets. CMS enables digital and mobile management of asset information, even when internet access is unavailable. Additionally, the enterprise selected Starfish Spaces, a space management program by Consertus, to provide 2D and 3D floorplans of physical space, including life-safety drawings. The Montefiore Einstein EAM project transitioned more than 1,000 end users to a new standard, unified solution accessible on-the-go from their company-issued iPad or mobile device. The solution also includes a simple, one-page web form for clinical personnel to request maintenance or service from the applicable department.

The process to achieve this unification involved a multi-year and enterprise-wide digital transformation, involving:

 13 locations +  102 buildings |  in 18 months

The team started by standardizing the naming convention for asset classes and categories, informed by the Facility Guidelines Institute (FGI) and American Society for Healthcare Engineering (ASHE) standards. Work order categories and priorities were also established, driven by common problems that carry specific templates for work order resolutions. These describe the various incidents that commonly occur in the affected departments. Developing the common problems has enabled root cause analysis for work orders, empowering greater awareness and risk avoidance.

Within the standardization process, assets were also designated a risk classification and asset criticality classification, driven by the Joint Commission and NFPA 99 asset risk categorization recommendations. A library of inspection, testing, and maintenance (ITM) plans was then created to align and reference applicable codes for all AHJs (authorities having jurisdiction), where applicable, enabling regulatory compliance. These plans outline the procedures that technicians follow when performing preventive maintenance, ensuring that assets are maintained on a predetermined frequency driven by leading industry standards. The plans also contain the documentation details of the work performed, the date it was performed, and the status of the asset, ensuring these details are readily available for compliance reviews. In some cases, these ITM plans were also customized to local regulations, allowing each Montefiore Einstein location to have site-specific plans.

With this process in place, weekly, monthly, quarterly, and annual ITM plans were established to ensure compliance with regulatory bodies including, but not limited to:



Federal: Occupational Safety and Health Administration, Environmental Protection Agency, Department of Health and Human Services, Food and Drug Administration, Centers for Medicare and Medicaid Services



National: The Joint Commission, National Fire Protection Association, American Society for Healthcare Engineering, Universal Medical Device Nomenclature System



State: Authorities having jurisdiction



City: New York City Fire Department

In addition to regulatory compliance, the ITM library facilitates swift and nimble reaction to any changes made to regulatory standards. Changes are applied to a shared library across 13 sites, made available in the CMS system, and rapidly deployed to all entities and end users. Recently, this shared library proved indispensable to quickly apply changes to procedures based on the Joint Commission Accreditation 360 standard updates, in alignment with the Centers for Medicare and Medicaid Services' Conditions of Participation.¹⁵

To ensure an accurate baseline of the inventory of engineering assets, Montefiore Einstein tagged engineering assets with QR codes and entered key asset information into the new EAM system. This information includes details such as manufacturer, serial number, model number, asset description, and location.

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► **Examples of engineering assets integrated into the system include:**

- HVAC units
- Generators
- Fire safety systems
- Elevators
- Exit signage

► **Examples of clinical engineering assets integrated into the system include:**

- Defibrillators
- Infusion pumps
- Patient monitors
- Ultrasound machines
- CT machines
- MRI machines
- Ventilators
- Patient lifts



From the exterior to the interior of the building, all spaces were scanned to encompass the entire footprint, including assets located on the roof.

Because each entity performed their maintenance programs differently before the project, the team worked in cross-entity working groups to design the new standard business processes for asset creation, work order creation, responding to service requests, conducting corrective maintenance, procuring assets, and generating reports. The team designed report prototypes based on the key metrics that are most beneficial for understanding the state of predictive and corrective maintenance for each department as well as on a cross-entity basis. Notable reports include eBinders (electronic binders) and the compliance report. Previously, entities would keep large, physical three-ring binders filled with printed copies of vendor reports and other work order completion documentation. In CMS, these “binders” have been consolidated into a searchable digital report called eBinders in the CMS tool, with color coding representing how a department is doing with respect to meeting the compliance requirements. The eBinders are set up by asset category and showcase work order completion records for assets indicating if the inspection passed or failed. Additional information, like the total number of work orders for the asset or who it was assigned to, is also highlighted within the report. Access to eBinders can be given to the regulator, facilitating a more streamlined response to regulatory inquiry. The business processes and report prototypes were developed, tested, and implemented in the CMS product.

Given the scale of the project, understanding existing data and defining a plan to migrate and transform historical data from legacy systems was central to making the new system operational, particularly for clinical engineering. The team evaluated existing EAM data at each Montefiore site and determined a mapping approach. There was an extensive period of data migration that occurred for the clinical engineering and fleet departments. In addition, extensive transformative work and data quality assurance had to be completed to integrate the data into the CMS system, enabling standardization across the different facilities and ensuring the removal of obsolete data. The data had to be refined by correcting or removing duplicate attributes and cleaning up free-text fields, asset categories, locations, manufacturers, status attributes, field configurations, procedures, procedure schedules, user/resource lists, data reports, dashboards, and more. Alternatively, the engineering department started with a paper-based system and a limited set of historical asset data to feed into the EAM initiative. Going forward, the EAM team will continue partnering with engineering to expand the standard asset history.

Regarding space information and the Starfish Spaces tool, an accurate characterization of 13 locations (12 hospitals and 1 university) across Montefiore Einstein captured the geometry of facilities and the important spatial metadata through automated 3D building information modeling (BIM). From the exterior to the interior of the building, all spaces were scanned to encompass the entire footprint, including assets located on the roof. Photogrammetry also played an important role, enabling teams to capture hundreds of overlapping photos of spaces from various angles (while blurring sensitive data), analyze them, and identify common points to map them to the 3D model.¹⁶ Through the “Owner’s BIM,” there was a structured approach to organizing only necessary architectural building information, including core model components such as walls, doors and windows, stairs and elevator cores, shafts, and rooms. For some spaces, the model expanded to include additional components such as sinks, workstations, nurse stations, counters, and other fixed components, to reflect the enhanced level of detail needed for planning, design,

construction, and operations. As a result of this thorough 3D-reality capture of spaces, Montefiore Einstein now has a digital twin with the Starfish Spaces platform, making space and asset location data and architectural layouts accessible by departments across the health system.

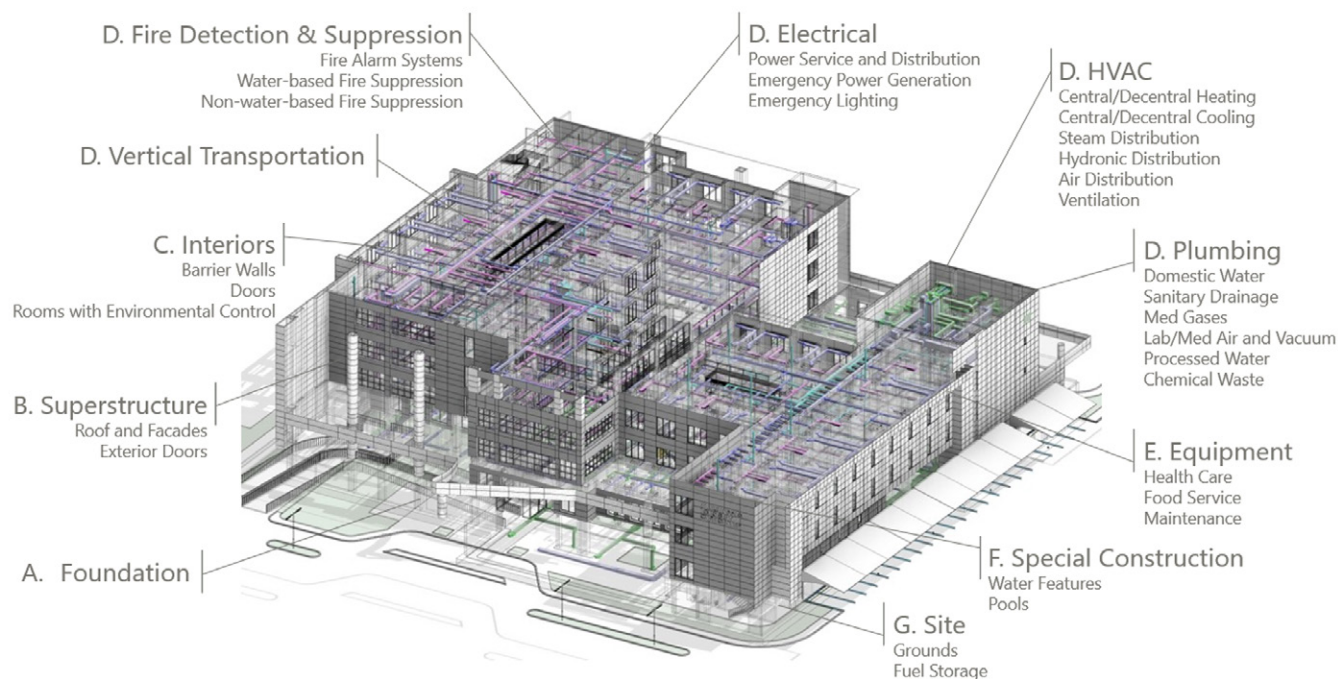
Within this process, room types were standardized to the FGI guidelines to unify how spaces are organized within the Starfish Spaces program. The EAM team partnered with facilities operations, engineering, design and construction, and architects to gather current naming conventions, fire and life safety drawings, and documentation to standardize nomenclature throughout rooms across the building (e.g., room names and room numbers). This standardization effort required months of collaboration, ensuring that standardization could be achieved for spaces and rooms throughout the building, including areas like:

- Elevators
- Elevator lobbies
- Stairs
- Nurse stations
- Patient rooms
- Patient toilets

Going forward, there is now a standardized process to onboard new properties as Montefiore Einstein expands, ensuring that new buildings are scanned, assets are collected, and new spaces are depicted within the Starfish Spaces program.

Based on user access, the Starfish Spaces tool enables smarter management of spaces. Without leaving their desk, users can navigate to spaces virtually, download up-to-date architectural drawings, measure square footage of a room, and much more.

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3D Building Information Model (BIM). Source: Consortus



Sample screenshots: Left, CMS View; Right, Starfish Spaces

Within the Starfish Spaces program, users also have access to panoramic, 360° virtual views of spaces and rooms at their location.

The digital foundation and environmental intelligence of Starfish Spaces complement the CMS system by leveraging space data from sites, buildings, floors, and rooms, with assets tagged and mapped for each location on 2D floor plans. From there, assets are linked to maintenance procedures, or ITMs according to asset category (and in some cases asset model), and scheduled for weekly, monthly, quarterly, or yearly inspections.

With the EAM project and solution:

Nearly
8.7 million

square feet of hospital space were scanned and characterized—equivalent to 3.24 Empire State Buildings.

Over 68,715

engineering and fleet assets were tagged at each entity with QR codes, enabling tracking in the CMS and Starfish Spaces systems.

Over 175,000

total assets are now managed within the system.

More than
two million

historical work orders were standardized, transformed, and migrated for access and informed decision-making.

Over 67,983

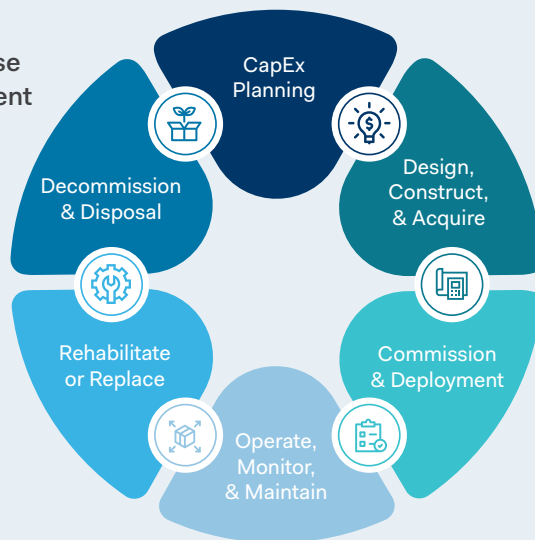
new service requests were added to the CMS system.

Roughly 21,913

new work orders were added to the CMS system.

136,500

procedures (ITM plans) were scheduled with code references to ensure compliance.

What We Do**Holistic Enterprise
Asset Management
Lifecycle**

The hospital system achieved measurable cost savings of \$9 million annually in one sustainability value case.

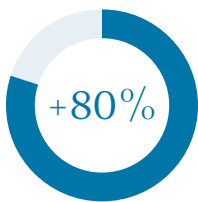
Value Delivered

The hospital system achieved a major improvement in data accuracy and visibility, resulting in fewer outages, measurable cost savings of \$9 million annually in one sustainability value case, and stronger, data-driven decision-making.

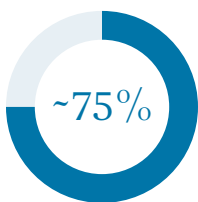
The \$9 million annual cost savings was calculated and analyzed for Montefiore Einstein's Moses Campus and the square footage of that location through the space management tool. Based on this analysis, the Energy and Sustainability team were able to increase their reportable square footage (the denominator of energy use intensity, EUI, upon which Local Law 97 penalties are calculated).¹⁷ The team calculated that the reportable square footage at Moses was 28 percent greater than they previously accounted for due to outdated and inaccurate paper-based floorplans in addition to non-standardized lists lacking an accurate count of assets. Through the updated, accurate digital floor plans available within the space management program, based on reality capture of the Moses entity, this enabled the reduction of penalties from New York City Local Law 97. Similarly, calculations were completed for Albert Einstein College of Medicine, resulting in reduced penalties as well. Both sites represent our largest entities. Through the EAM tools, the Energy and Sustainability team maintains improved readiness for NYC Department of Buildings and Sustainability audits, enabling more informed and sophisticated audits, energy efficiency recommendations, and decarbonization plans.

Having access to their accurate, real-time asset count and information within the office and in the field enabled the organization to achieve operational excellence, right-size their team in the areas needed, and create efficiencies through their new mobile workforce.

Technicians complete work orders via iPads, enhancing workflows, and improving timely service delivery. Subsequently, coordinators, managers, and leaders access a digital system to track performance, manage work, and analyze work order completion metrics.



Employees satisfied with the new system



Employees said EAM tools improved readiness for regulatory review

Reduced time and effort, combined with improved accuracy, have contributed to employee satisfaction. Of the employees who responded to a survey, more than 80 percent reported satisfaction with the new system. In addition, nearly 75 percent said the new EAM tools improved readiness for regulatory review.

The solution has been successfully extended to additional use cases, delivering expanded value to Montefiore Einstein. For example, the reality capture baseline was used to develop a wayfinding resource for roughly 800 students at Albert Einstein College of Medicine. The digital mapping tool, Einstein Explorer, enables students to quickly and easily locate spaces across the campus from their mobile device. Prior to this wayfinding tool, the college was looking to avoid risks of citation, as location knowledge is an accreditation requirement. Our baseline ensures that medical students can easily find classrooms, study spaces, lockers, patient care areas, and wellness spaces at the medical school and affiliates.

Through the Einstein Explorer wayfinding resource, the following value has been achieved:

► Improved student experience

Medical students save time and can focus on studying or completing other tasks, instead of searching for a classroom, storage area, clinical space, or wellness space.

► Reduction in service time

Clerkship directors no longer need to ensure medical students are briefed on where to go at all clerkship and acting internship orientations.

► Risk avoidance

Ensure ongoing compliance with accreditation standards and risk management.

Overall, the EAM solution enabled standardization, governance, and adoption of digital tools for the Montefiore Einstein health system.

Implementation Strategies

Successfully implementing EAM systems at scale requires careful planning, coordination, and adaptability. Drawing from real-world experiences, this section highlights key lessons learned and best practices to help guide organizations through the complexities of large-scale EAM projects. By understanding these insights, teams can better position themselves for a smooth and effective implementation.

Project Team Coordination

- Clearly define roles and responsibilities for all team members.
- Maintain an accessible directory of contacts for key representatives from internal teams, vendors, and site leads.
- Clarify vendor leadership and support contacts for streamlined issue resolution.
- Invest time early to build strong relationships with external partners.
- Carefully manage achieving project milestones to maintain the established schedule.
- Actively identify and manage project issues and risks to ensure they do not derail the project.

Organizational Change Management

- Assess site readiness before implementation and design change management efforts accordingly. Considerations include personal technology habits of end users, use of other digital tools within the organization, the number of expected end users and their geographic spread, understanding of current business processes, and leadership support for enterprise-wide initiatives.
- Engage sites early to build buy-in and address unique challenges.
- Maintain high-quality engagement and consistent communication among teams.
- Identify leadership, department leads, and active end users for each site.



- Engage operational teams such as operational leaders, facilities engineering, and clinical engineering.
- Ensure the organizational change management strategy includes methods to communicate and engage with end users, plans to train and build capabilities of end users, and opportunities to regularly measure and incorporate end user feedback.
- Incorporate measurement mechanisms into processes to identify areas of progress in adoption and utilization of tools. Considerations include measuring the effectiveness of training, communications, and engagements.

Scope Management

- Define the scope of the project, enabling team members to align on the project's vision and objectives.¹⁸
- Monitor and adjust for scope creep. Update schedules transparently and ensure a prioritization system is in place to evaluate change requests or enhancements to the scope.
- Set ambitious but realistic goals to elevate team performance.

System Implementation and Data Quality

- Conduct comprehensive testing, including testing involving select end users prior to go-live.
- Improve inventory data accuracy before implementation.
- Prepare users for platform transitions and hardware deployment challenges.
- Ensure compliance with data privacy standards and scrub sensitive data.

Go-Live Planning

- Start small, with a single department, to benefit from learnings that can be applied to subsequent deployments.
- Avoid major holidays and paid time off (PTO) periods for go-live dates.
- Allocate sufficient resources for data migration, translation, and hardware deployment.
- Define mechanisms for long-term support and continuous improvement.



Key Takeaways

- ▶ **Invest in upfront planning** and stakeholder identification.
- ▶ **Be flexible and responsive** to scope changes and resource needs.
- ▶ **Prioritize change management** tailored to site readiness.
- ▶ **Schedule thoughtfully** and ensure support availability.
- ▶ **Focus on data quality** and privacy compliance.

Future Trends in EAM for Healthcare

AI and Machine Learning for Predictive Maintenance

As healthcare EAM evolves, AI and machine learning are set to transform predictive maintenance by providing real-time data from IoT sensors on medical equipment such as MRI scanners and ventilators. For example, through algorithm evaluations and detections of subtle shifts in performance data of the equipment, EAM can signal a need for maintenance in advance of failure, which will also assist in minimizing disruptions to patient care. By enabling precise predictions of failures, the data could reduce unplanned downtime by approximately 30–60 percent and significantly extend asset lifecycles.¹⁹

As AI continues to improve, we expect even greater usage of forecast analytics that predict issues and recommend automated maintenance to ensure continued regulatory compliance and cut maintenance costs by as much as 40 percent.²⁰ AI will also enable remote and resource-strained hospitals and providers to increase their care offerings and enhance operational efficiency.

Mobile and Cloud-Based EAM Platforms

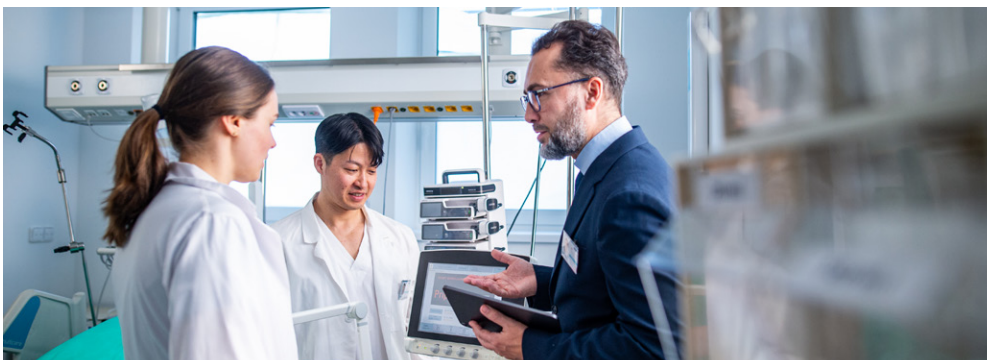
Future trends in mobile and cloud-based EAM platforms will provide location-independent access to asset data, enabling technicians to perform real-time diagnostics and updates via mobile apps, including in remote locations. Seamless access will be provided through hybrid cloud architectures (combining local private data centers with public cloud services) and edge computing (storing data close to the source, such as in wearable devices and hospital equipment).¹² Integrating these platforms with AI will allow for live monitoring, eliminate silos between on-site and off-site teams, and ensure scalability for handling extensive healthcare datasets.

As AI evolves in this area and focuses on user-friendly interfaces, driving efficiencies, enhancing collaboration tools, and compliance with stringent healthcare data privacy standards, it is expected to support expansion in telemedicine and a more patient-centered healthcare infrastructure.

Precise predictions of failures could reduce unplanned downtime



Forecast analytics could cut maintenance costs



Healthcare organizations are increasingly integrating cloud computing with blockchain technology to provide scalable storage, secure data sharing, enhanced traceability, and improved protection across healthcare ecosystems.²³

Having instant access to greater datasets of information can lead to faster diagnoses, better collaboration, predictive needs, and flexible infrastructure scaling for healthcare systems. These platforms can bring specialty services and expertise to remote hospitals or small practices where they were not previously available while also expanding the reach and services healthcare organizations are able to offer.

Integration with Smart Building Technologies

Future smart building integration with EAM is anticipated to create interconnected ecosystems that optimize predictive maintenance and energy use based on real-time occupancy and environmental data. Assets such as HVAC systems, lighting, and medical devices will communicate the data via IoT platforms, ultimately reducing operational costs and increasing sustainability.²¹

In the evolution of AI-driven building management systems, our prediction is that facility needs responses will be automated. Adaptive climate control and integrated emergency protocols will provide enhanced patient comfort and safety. Edge computing with local equipment and monitors will be leveraged for faster real-time data processing of certain building applications closer to where the data are generated, increasing resilience from disruptions, aligning with green building standards, and improving asset reliability in dynamic healthcare environments.²²

Cybersecurity and Data Governance

For healthcare, cybersecurity is less about AI and more about integrating it safely. Digital data must maintain the stringent compliance for HIPAA, Health Information Technology for Economic and Clinical Health (HITECH) health information technology, general data protection, consumer privacy, state-specific regulations, and Food and Drug Administration regulations. Even as portions of data are shared across platforms, security checks and assurances must be in place and maintained consistently to provide protection and security through any future changes in policy.

To assist healthcare organizations in their protection of sensitive patient information, cloud service providers are increasing their security features beyond the compliance-level measures of encryption, multifactor authentication, and access controls, to cover the enhanced data security measures of advanced threat detection, cybersecurity monitoring, and automated compliance checks. Healthcare organizations are increasingly integrating cloud computing with blockchain technology to provide scalable storage, secure data sharing, enhanced traceability, and improved protection across healthcare ecosystems.²³

Looking ahead, cybersecurity and data governance will increase the use of zero-trust models to continue to combat insider threats and supply chain vulnerabilities and protect critical asset data from medical devices while also ensuring uninterrupted operations, including in vulnerable hospital networks.²⁴

To mitigate risks and enable secure integration of EAM with emerging technologies, trends will emphasize privacy-enhancing technologies, real-time audits, and automated governance frameworks to manage the surge in IoT-generated data and meet evolving regulations.²⁵ This approach will prioritize data integrity and foster trust in digital healthcare systems.²⁶

Conclusion and Recommendations

In summary, healthcare systems with mismanaged assets can encounter significant challenges with:



Patient safety and care quality

- Faulty equipment can lead to treatment delays, incorrect diagnoses, or administration of the wrong medication.²⁷
- Poor space management can lead to bed shortages, capacity constraints, and postponed surgeries.²⁸



Operational efficiency

- Aging equipment with no preventive maintenance can lead to unplanned downtime and unavailability.²⁹
- Uncertain asset utilization and inventory visibility can lead to overstocking, stockouts, underused assets, and uninformed capital planning.²⁹



Financial performance

- Lost or stolen equipment replacement and emergency repairs resulting from neglected maintenance are unplanned expenses and may lead to over-purchasing.²⁹
- Budget constraints from rising costs of labor and supplies combined with underutilized assets may lead to extended debt and inadequate reimbursements, creating challenges meeting capital investment requirements.³⁰



Regulatory compliance

- Inadequate keeping of maintenance, calibration, and disposal records violates standards and risks fines and accreditation loss.²⁹
- Equipment theft, failure, or noncompliance can lead to lawsuits if linked to patient harm.²⁷



Staff productivity

- Time spent locating equipment costs the industry \$14 billion annually in lost productivity.²⁹



Cybersecurity and digital infrastructure

- With 63 percent of known cybersecurity vulnerabilities being found in hospital networks, research shows that many stem from untracked or exposed assets.³¹
- As assets become more interconnected via hospital networks, Wi-Fi, or Bluetooth, vulnerabilities can be exploited and used to move within the network to compromise electronic health records or control systems.



Many of these challenges result in immediate, high-impact consequences for health systems affecting legal, financial, and clinical areas.

Enterprise asset management systems are indispensable tools for healthcare facilities, offering comprehensive visibility, control, and proactive management of assets. By integrating EAM systems, healthcare organizations can enhance asset reliability, ensure compliance, control costs, and streamline operations. These systems transform asset management from a reactive to a proactive approach, significantly contributing to the overall efficiency and resilience of healthcare infrastructure.

Recommendations for Facility Managers

Facility managers should prioritize the implementation of EAM systems to optimize asset management. Key recommendations include:

- ▶ **Adopt preventive and predictive maintenance.**
Implementing preventive and predictive maintenance schedules can reduce unplanned downtime and extend the lifespan of assets.
- ▶ **Ensure compliance and audit readiness.**
Use automated documentation and reporting features to streamline audit preparation and ensure regulatory compliance.
- ▶ **Leverage data for decision making.**
Use data-driven insights to make informed decisions on repairing, replacing, and retiring assets, thereby minimizing unnecessary expenses.
- ▶ **Enhance workforce productivity.**
Real-time asset tracking and automated alerts can improve workflow efficiency and staff productivity.

The future of healthcare infrastructure lies in the continuous evolution and integration of advanced technologies. EAM systems, enhanced by AI, machine learning, and the IoT, will play a pivotal role in predictive maintenance, smart building integration, and cybersecurity. By embracing these advancements, healthcare facilities can ensure operational efficiency, reduce costs, and improve patient care. Facility managers must stay ahead of these trends to future-proof their infrastructure, ensuring that their organizations remain resilient, compliant, and capable of delivering high-quality care in an ever-changing landscape.

About the Author



Christine Hillman is the Enterprise Asset Management Director at Montefiore Einstein with extensive experience in facilities, financial, project, and operations management. She oversees the enterprise asset management lifecycle, including capital planning, collaboration with design and construction, management of assets, and reality capture of space. Christine holds a BS in business management from Fordham University and has completed Lean Six Sigma and project management courses. At Montefiore Einstein, Christine led the system-wide digital transformation across 13 sites, resulting in a unified space and asset

management program—the first of its kind in our regional healthcare area. This included unifying its clinical, engineering, radiation safety, and fleet assets. The EAM Solution is delivering Montefiore's vision of being a premier academic health system with state-of-the-art facilities.

Prior to joining Montefiore Einstein, Christine served at NewYork-Presbyterian Hospital, where she played a pivotal role in developing, managing, and optimizing the facilities department's digital transformation. She also led business process engineering with a focus on facilities operations, design and construction, project planning, and management. In addition, Christine has extensive consulting experience, providing strategic guidance and solutions to various organizations across industries, including supporting the Army Corps of Engineers.

Christine is actively involved in community service including fundraising with the American Cancer Society and volunteering with the Open Stable Foundation as a therapy assistant. In her free time, she enjoys horseback riding, playing the ukulele, and knitting.

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