




Editorial — Between innovation and legacy: Challenges in asset lifecycle management

Editorial — Entre a inovação e a herança: Desafios na gestão do ciclo de vida dos ativos

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This 6th edition of RAE is composed of full-length manuscripts selected amongst works that have been originally presented in conferences and seminars of the Iberian asset management ecosystem, throughout the year 2025. In this same year 2025, the importance of the asset lifecycle management became increasingly important. There was the accident in Lisbon with the “Elevador da Glória” (Glory Elevator) and the accident in Adamuz, Andalusia, between two trains. Both accidents unfortunately resulted in a high number of fatalities. The coexistence of historical assets and contemporary technologies poses challenges to asset lifecycle management (ALCM). These accidents have been attracting much attention globally and have led us to reflect on asset management in public transport in light of industry standards and the scientific asset management literature. It is easy to conclude the importance of good management throughout the lifecycle of this equipment and infrastructure.

Asset Life Cycle Management refers to the systematic and structured approach to managing physical assets — from industrial machinery and infrastructure to buildings and vehicles — throughout every phase of their existence. The primary goal is to optimize asset performance and total cost of ownership (TCO) while ensuring safety, compliance, and business continuity

The ISO 55000:2024 standard reinforces the principles of value, alignment, leadership, and results (including adaptation and sustainability) for asset management systems, placing lifecycle management as the central axis for value creation and risk reduction.

In this regard, the current standard 55001:2024 includes a topic on “Operational planning and control, including life cycle management” (8.1). This point states that “the organization shall plan, implement, and control the processes, including life cycle processes, necessary to meet the requirements and to implement asset management planning actions”. This standard clarifies that life cycle processes involve the creation, acquisition, use, maintenance, improvement, renewal, or disposal of assets.

Each phase is inherently connected, and decisions made during acquisition will invariably affect maintenance costs and disposal strategies decades later. This interconnectedness is precisely where digitalization adds transformative value.

The rigorous application of Asset Lifecycle Management (ALCM) principles could have significantly mitigated the risks that existed and will always exist in asset intensive sectors, such as is the case of public transport. Academic literature consistently demonstrates that practices such as formal change management, systematic risk assessment, reliability-centered maintenance (RCM), independent audits, and continuous monitoring of critical components are crucial for preventing serious failures in complex equipment and infrastructure (Amadi-Echendu et al., 2010; Hastings, 2015; Woodhouse, 2014).

The insufficient integration of these practices in the case of the “Elevador da Glória” reveals systemic flaws in supervision, planning, and control, highlighting the importance of a mature ALCM model to ensure operational safety in historic transportation systems, which are highly dependent on continuous structural reliability. The incorporation of ISO 55000 standards into historic transportation and tourism policies, as well as the clarification of roles between operators and regulators, can reduce risks or prevent accidents in critical assets.



Research conducted within an ISO/TC251 working group in asset-owning organizations clearly identified the importance of asset lifecycle management for organizations, and several elements of ALCM were highlighted as areas where further guidance would be very useful. Most organizations already use established technologies such as Enterprise Asset Management (ERA), Computerized Maintenance Management (CMM), Asset Performance Management (APM), Risk Analysis, etc.; however, the adoption of emerging Industry 4.0 digital technologies appears to be in its early stages, justifying the need for guidelines for incorporating digitalization into ALCM. The adoption of sustainability practices is seen as a lower priority – this may be because few organizations are focused on sustainability or, more likely, because there is a lack of knowledge and guidance on how asset management, and in particular asset lifecycle management, can contribute to achieving sustainability goals.

Digitalization is fundamentally reshaping how ALCM is practiced. The convergence of the Internet of Things (IoT), Artificial Intelligence (AI), Big Data analytics, cloud computing, and digital twins is enabling organizations to move from reactive, time-based asset management towards predictive, data-driven approaches that unlock new levels of efficiency, reliability, and sustainability.

In an increasingly competitive and resource-constrained industrial landscape, organizations are under growing pressure to maximize the value of their physical assets while minimizing costs, downtime, and risk. Asset Life Cycle Management (ALCM) has emerged as a strategic discipline that addresses this challenge — encompassing the planning, acquisition, operation, maintenance, and disposal of assets across their entire lifespan.

In summary, these cases that occurred in 2025 in Portugal and Spain demonstrate that gaps in asset lifecycle management—namely in change management, technical inspection, maintenance verification, and institutional supervision—directly contributed to the occurrence of the events. These cases, and others that occur with critical equipment and infrastructure, reinforce the need for the rigorous adoption of ALCM principles, not only as a way to better manage assets but also to prevent high-severity accidents.

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Declaração Ética

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