

Overview

This standard defines the competencies required to evaluate and optimise the performance of smart infrastructure systems. It includes defining relevant metrics and KPIs (Key Performance Indicators), analysing operational and environmental performance data, identifying areas for improvement, and implementing optimisation strategies that enhance infrastructure efficiency, user value, and sustainability impact.

Professionals applying this standard support data-informed decision-making across infrastructure lifecycles. They are instrumental in maximising system uptime, reducing carbon and energy usage, improving service delivery, and demonstrating value through robust performance reporting.

This standard is intended for smart infrastructure professionals responsible for performance evaluation and continuous improvement, including infrastructure analysts, systems engineers, and digital operations leads.

Performance criteria

You must be able to:

1. Define performance goals, benchmarks, sustainability criteria, and key performance indicators (KPIs) aligned to the function and operational objectives of smart infrastructure systems.
2. Collect and analyse infrastructure performance data from smart infrastructure systems, using real-time telemetry and automated benchmarking to support performance evaluation.
3. Identify trends, gaps, and performance issues that affect smart infrastructure efficiency, availability, and sustainability.
4. Evaluate the environmental and sustainability impact of infrastructure operations, including carbon accounting and social impact metrics, against regulatory, environmental, and service-level standards.
5. Develop and implement optimisation strategies based on data, stakeholder input, and system modelling, including digital twin simulations and AI-based scenario testing.
6. Collaborate with operational and engineering teams to test and refine performance improvements.
7. Document and communicate performance outcomes and improvement actions to relevant stakeholders in a clear and actionable format.
8. Contribute to the design and refinement of accessible performance dashboards and data visualisation tools, applying dashboard design principles that support inclusive communication.
9. Support audits and reviews related to smart infrastructure performance reporting.
10. Track the impact of performance changes on holistic performance outcomes, including safety, energy efficiency, cost, and accessibility.

Knowledge and understanding

You need to know and understand:

1. Performance metrics, frameworks, and KPIs relevant to smart infrastructure systems, including technical, environmental, and ESG (Environmental, Social, and Governance)-related measures.
2. Analytical methods for performance evaluation, including statistical, comparative, and time-series analysis, and techniques for working with real-time telemetry.
3. Industry standard tools used to monitor and visualise infrastructure performance.
4. Regulatory and compliance standards for infrastructure operations and sustainability.
5. Methods for identifying inefficiencies or failure patterns in connected infrastructure systems.
6. Continuous improvement principles and optimisation strategies for energy, cost, and operational efficiency, including iterative feedback cycles, adaptive control systems, and continuous learning loops.
7. Collaborative techniques for evaluating and refining system-level performance through iterative review and continuous learning processes.
8. Techniques for reporting and communicating performance data and insights in ways that support continuous learning, feedback integration, and adaptive optimisation.
9. Impacts of performance optimisation on safety, cost, energy, and resilience, including how continuous learning loops inform the improvement of holistic performance outcomes.
10. Stakeholder engagement approaches used to evaluate performance outcomes and prioritise improvement actions.
11. Techniques for integrating performance and sustainability insights into infrastructure planning and procurement cycles.

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Evaluate and Optimise Smart Infrastructure Performance



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