Special Session proposal for IJCIEOM 2026 conference
SPS7

1. Session title:

Digital Transformation in Healthcare: Lean Healthcare, Patient Safety, and Organizational Maturity in the Public and Private Systems

2. Session objectives:

This Special Session aims to promote convergence between Production Engineering and the contemporary challenges of Digital Transformation in Healthcare, exploring scientific and practical contributions in strategic areas such as production and operations management, quality, logistics, ergonomics, operations research, project management, and organizational engineering. The digital transformation of the Brazilian Unified Health System (SUS) requires frameworks capable of optimizing care and administrative processes, expanding operational efficiency, enhancing patient safety, and supporting institutional maturity. Studies developed in the Brazilian context demonstrate the integration of Lean Thinking, Design Thinking, continuous improvement, and active methodologies as solutions for professional training through virtual platforms, process management, and waste elimination (IEEE Induscon articles). Research also confirms the application of Lean tools—such as Value Stream Mapping (VSM), Kaizen, 5S, root cause analysis, and Kanban—to strengthen internal communication, standardize routines, reduce care-related failures, and increase operational reliability in healthcare services, with a central focus on patient safety (IEEE Induscon articles).

Furthermore, analyses of digital maturity in public hospitals highlight barriers related to governance, infrastructure, organizational culture, risk management, and project capability, evidencing the need for integration among economic engineering, organizational engineering, operations research, and strategic management to accelerate digital transformation within the SUS and to rationalize investments in technology, processes, and people.

The session is aligned with the core areas of Production Engineering and will promote technical and scientific debates on:

- **Production and Operations Management:** care flows, modeling, standardization, and process optimization;
- **Quality Engineering:** audits, metrics, and Lean tools for patient safety;
- **Logistics and Supply Chain Management:** traceability, hospital material flows, inventories, medications, and cold chain management;
- **Project Management:** digital systems implementation and governance;
- **Operations Research:** simulation, decision models, algorithms, and analysis of clinical and administrative data;
- **Organizational Engineering:** digital culture, innovation management, knowledge, and hospital technology;
- **Economic Engineering:** financial feasibility, risks, costs, and investments in healthcare

digitalization;

- **Work Engineering:** ergonomics, process design, and the impact of digitalization on clinical routines;
- **Sustainability Engineering:** Lean applied to waste reduction, environmental optimization, sanitary safety, and efficient resource use;
- **Engineering Education:** digital training, professional qualification, and development of essential competencies in healthcare.

The central purpose is to consolidate Production Engineering as an advanced support field for public healthcare, directly contributing to operational excellence, continuous improvement, institutional sustainability, governance, innovation, and quality of care.

3. Organizer(s):

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