

Call for Papers

Special Issue of *Production and Operations Management Journal* “Managing Autonomous and IoT-driven Intralogistics Operations”

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Managing performance of intralogistics operations, i.e., within facilities such as manufacturing, order fulfillment warehouses, retail stores, hospitals, or terminals, is critical in fulfilling customer expectations. Customer product and service expectations can be volatile. Traditional decision-making for intralogistics operations mostly relies on data collected over long-range intervals with significant delays in processing. However, with Internet of Things (IoT) devices, detailed data can be captured and relayed real-time and systems are geared up for making dynamic decisions in real-time. The advent of new technologies such as smart IoT devices, Artificial Intelligence (AI), and robots allows improving the intralogistics operations by facilitating time-sensitive decisions and reducing costs. All critical resources, though decentralized, are connected to a wider network enabling to capture and process large amounts of data and use these data to improve resource coordination and secure informed data-driven decisions.

For example, e-commerce order fulfillment centers apply new autonomous, robotic handling systems and information-rich technologies to forecast demand, allocate stock, and pick, pack, and ship large numbers of customer orders in very short time frames and deliver them same day in specific time intervals. The autonomous robotic technologies require little space, provide flexibility in managing varying demand requirements, and are able to work 24/7. New categories of autonomous handling systems, such as shuttle-based storage and retrieval systems, robotic mobile fulfillment systems, and autonomous mobile robots collaborating with humans, have evolved. Such systems have a large degree of autonomy, and are used in dynamic interaction with their environment: people, products, locations, and other handling systems, generating large streams of data. Objects, people, storage, and handling systems can all be connected in the IoT warehouse. This generates great challenges for managers to select, manage, and organize systems for performance.

Likewise, tracking real-time stock and people movement in retail stores using IoT devices can help to plan the inventory better and position the store personnel at strategic locations. IoT solutions and connected medical devices allows healthcare providers to monitor patients in real time. This would also eliminate unnecessary visits to the provider, and reduce hospital stay times and readmissions. IoT in container terminals and ports can help minimize traffic, position the containers better in the yard for onward

movement, empower their workforces to increase throughput, and decrease carbon emissions while making traffic safer. IoT in production facilities can also track the human movement and improve safety, efficiency, and worker productivity.

Research is needed to leverage unique system features (such as autonomous control, flexible layouts, and networked and dynamic operations). New models and methods are needed to address the management challenges for such systems, in particular, for the integration of subsystems. Facilities with integrated robotic systems, interacting with humans for specific tasks, will form a new category. Vital operations design, planning and control tasks, such as methods to design layout, worker routing, human-robot interfacing, and resource-to-order assignment will have to be revisited for new robotized facilities. In addition, the workers that interact with the IoT-driven facilities require different skills and behavioral traits to operate successfully.

The increasing level of automation in facility processes promises to improve operational flexibility and to cater growing customer expectations. The focused issue on Managing Autonomous and IoT-driven Intralogistics Operations intends to reflect these trends, efforts, and results. The aim is to present original, cutting-edge contributions – methodological and theoretical developments, as well as innovative and insight-provoking applications – that address a wide variety of issues in the management, design, modeling, planning, and organization of intralogistics systems. Topics of interest include (but are not restricted to):

- IoT in facilities such as Retail stores, Healthcare, Warehouses, Terminals, Production facilities
- Data-driven fulfillment models and decisions
- Automation and technology selection
- Operational policies in robotic/ IoT-driven facilities
- Robotized facilities
- Human-robot collaboration
- Use of augmented and virtual reality in fulfillment operations
- IoT aspects in E-commerce
- Human and behavioral factors in automated facility operations
- Safety and security in facility operations
- Planning-feedback process

We welcome submissions that examine operational problems that arise outside the traditional boundaries of intralogistics operations. These include facilities such as manufacturing, order fulfillment warehouses, retail stores, hospitals, or terminals. All submissions must have clear managerial contributions, must be built on rigorous research methods that serve as an appropriate framework to analyze decisions with real-time data: analysis of data, mathematical analysis, analytical models, behavioral theories, etc. We expect the study to address a new (and potentially game-changing) phenomenon, with a sufficient level of rigor that is consistent with the high standard of the journal.

There is no page limit on initial submission. However, you should strive to keep your paper to be no longer than 38 pages double-spaced in a font size of 11. The page limit on the final version is 38 pages. Please follow the detailed submission guidelines provided at http://www.poms.org/journal/author_instructions/.