

Using Lean Practices to Overcome Challenges with Improving Warehouse Operations

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Abstract

This improvement project was conducted in a warehouse that provides repair services and storage for the equipment, supplies/consumables, and repair parts needed to perform technical cleaning and hygiene services for clients such as in schools, hospitals, airports, etc. While initially organizing materials one section/area at a time using 5S (sort, set-in-order, shine, standardize, and sustain), challenges encountered included space limitations with the existing layout, co-location of repair and storage operations, inability to temporarily shut-down operations to organize, and resistance to disposing of unneeded items. To resolve the space/layout issues, management invested in renovating the warehouse. While cleaning prior to renovations, many sorting activities took place. Post-renovations, to organize and streamline operations (set-in-order and shine), a new space utilization plan was developed and implemented that organized items across the warehouse into separate storage zones, designated space only for performing repairs, and stored all repair parts together in the same zone. To standardize, visual controls were implemented, including floor markings and storage location labels, as well as a shadow peg board and a toolbox with foam cut-outs in the repair work area. In addition, standard operating procedures were developed. To sustain, a bi-weekly audit procedure was developed, and a communication board was installed where, among other things, audit feedback would be posted. Finally, inventory reorder points were established, and a Kanban system was implemented for material replenishment.

Keywords

Action research, Lean, 5S, Warehouse operations

Biographies

Diogo A. Gomes is a second-year Master's student in Management of Services and Technology at Iscte – Instituto Universitário de Lisboa. In 2019 he earned a Bachelor's degree in Business Administration at ULHT- Universidade Lusófona de Humanidades e Tecnologias. Diogo A. Gomes formerly worked at Decathlon Portugal's Logistic Supply Center, where he was assigned to a project that developed his knowledge in the reorganization of operations layout, management stocks, and the monitoring of productivity and service quality. His work on the e-commerce team, where

he developed an understanding of customer satisfaction and service quality, was a vital part of his experience. He is currently the on-site project leader for an action research project using lean methods to overcome challenges and improve the overall operations of a cleaning services company.

Jamison V. Kovach is the PMI Houston Endowed Professor in Project Management at the University of Houston. She received her Ph.D. in Industrial Engineering from Clemson University. Her industrial experience includes more than five years as a product and process improvement engineer in the U.S. textile industry. Her current research investigates the use of methods for product and process innovation, expanding the use of these methods, and developing new improvement approaches. For her work, Dr. Kovach was recognized as the 2010 ASQ Feigenbaum Medalist, and she received the ASQ Six Sigma Forum Award for the Advancement of Six Sigma in 2019. Dr. Kovach is an Academician in the International Academy for Quality, an ASQ Fellow, and the Editor for *Lean & Six Sigma Review*. In addition, Dr. Kovach is a Fulbright Scholar who completed her project in 2022 at ISCTE – Instituto Universitário de Lisboa, Business Research Unit, Lisbon, Portugal. Dr. Kovach is also the Director of the UH- College of Technology’s Lean Six Sigma Professional Training Program. She was trained in Lean Six Sigma by the former CEO of the Juran Institute, and has experience applying this valuable methodology through her own work experience as well as in conjunction with industry partnerships for over 20 years. She has published more than 65 articles on the subject of Lean Six Sigma and related topics, and she regularly presents her work at conferences and professional meetings around the world.

Teresa Cardoso-Grilo is Assistant Professor at the Department of Marketing, Operations and General Management (DMOGG), ISCTE Business School. She received her PhD in Engineering and Management from Instituto Superior Técnico (IST), University of Lisbon. She is currently the Deputy Director of the DMOGG, Director of the Master in Management of Services and Technology at ISCTE Business School, and also the Coordinator of the Specialty of Operations Management, Logistics and Supply Chain Management of the PhD in Management at ISCTE Business School. Teresa Cardoso-Grilo is an Integrated Researcher at the Business Research Unit (UNIDE-IUL). She has published several scientific articles focused on the development of methods to support the planning of healthcare services, namely in the international journals *European Journal of Operational Research*, *OMEGA - The International Journal of Management Science*, *Socio-Economic Planning Sciences* and *Health Care Management Science*.