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# Attaining Industrial Integrity and Competitiveness in Bangladesh's RMG Sector via Lean Manufacturing Techniques

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## Extended Abstract

**Introduction:** Ready-Made Garments (RMG) have evolved into Bangladesh's main industry, overtaking the other industries. World Bank: Bangladesh's RMG exports rose from US$13 billion in 2006 to US$34.1 billion in 2019, making it the world's second-biggest exporter after China [1]. Bangladesh just fell to third, behind China and Vietnam. According to the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), Bangladesh's clothing shipment to substantial nations fell 25%. As exports fall, the RMG industry appears operational standardization, inventory control ineffectiveness, production hold-ups, rising quality standards, and rising rivalry worldwide. These issues hamper the sector's recent expansion and worldwide competitiveness. Lean Manufacturing, which has its roots in the TPS, provides a practical approach to these problems. Improve production stability and competitiveness in the RMG industry with the help of TPS, which was developed by Toyota in the early 20th century [2]. TPS minimizes waste by optimizing processes, controlling inventories, minimizing non-value-added operations, and boosting efficiency. In the field of RMG, where simplified operations and low waste are essential to worldwide market dominance, this strategy is suitable for improving production consistency and profitability.

**Problem Statement:** Bangladesh faces challenges in adopting Lean Manufacturing principles effectively, a proven continuous improvement method. The Ready-Made Garment (RMG) business in Bangladesh, despite its economic importance, has operational inefficiencies such as prolonged lead times, substantial waste, quality deficiencies, and inadequate space utilization. The issues arise from inefficient workflows, overproduction, excessive inventory, and unstable supply chains, adversely affecting profitability and market share in a swiftly changing global market. Employing Lean Manufacturing methodologies, particularly Value Stream Mapping (VSM), Just-In-Time (JIT), Kaizen, and 5S, may resolve these ongoing challenges by strengthening production, eliminating waste, improving workstation functionality,

and cultivating a culture of continual enhancement amongst workforces. Lean principles reduce decreases in productivity caused by equipment bottlenecks while promoting sustainable development and compliance with global standards for quality, so enhancing the sector's resiliency and long-lasting economic sustainability. Lean Practices specifically, Value Stream Mapping (VSM) and Just-in-Time (JIT), have the potential to address these challenges by minimizing waste, enhancing production reliability, and creating a culture of ongoing improvement among workers.

**Objectives:** (1) Evaluate how Toyota Production System-based Lean Manufacturing might enhance Bangladesh's RMG sector's reliability in operation. (2) Find out how much of an impact Lean methods might have on profitability and consistency in output.

**Methodology:** This mixed-methods study will employ techniques that are both qualitative and quantitative. A rigorous Lean Manufacturing-related review of literature for the RMG industry is set to be done. Lean case studies from Bangladeshi RMG companies will be evaluated to discover what factors affect productivity, defect elimination, and profitability. Value Stream Mapping (VSM), Kaizen, 5S, Single-Minute Exchange of Dies (SMED) and JIT can be assessed for RMG production challenges. Conversations with manufacturing executives and employees, manufacturing process assessments, and operational indicators including cycle time, takt time, nonconforming units, and resource utilization (equipment and worker) will be collected [3-5]. A comparison of Lean and non-Lean factories will be made.

**Findings:** Introduction of Lean practices reduce lead time by 25-33% [6], improve control of inventory, and reduce failure rates by 20-40%. A particular RMG plant cut lead time by 61.20 percent after using Value Stream Mapping (VSM) [3] and two case studies found that using SMED cut changeover times by 42.1 percent and 70.76%, respectively [7]. Research studies show that Kanban and Kaizen strengthen turnover and encourage employees in manufacturing to optimize continuously. Lean Principles practicing plants claimed improved operational reliability and a better spot in the worldwide marketplace.

**Contribution Anticipated:** With an eye on bolstering economic performance and stabilizing production, this study will help build a complete framework for applying Lean Manufacturing in the RMG industry. Higher profitability and sustainability, as well as compliance with international quality and environmental responsibility requirements, are attainable goals for the RMG industry through waste reduction and process optimization [8]. Policymakers, business moguls, and plant managers will all be able to use the study's actionable suggestions for implementing Lean concepts [9]. Efforts to keep Bangladesh at the forefront of the global textile market would also benefit from this.

**Conclusion:** To strengthen economic ties between the two nations and increase operational excellence and ecological sustainability, this study reveals that the RMG sector in Bangladesh and Japan's Lean Manufacturing principles might work together in a complementary fashion.

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