MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

«National University of Science and Technology MISiS»

MAJOR	Informatics and Computer Science
PROFILE	Data Science
GROUPE	МИВТ-23-6А

ASSIGNMENT

Course: Quality Management

Subject: Comparison between Six Sigma, Toyota production system (TPS) and lean management

Student: Hazim H. A. Al-Haidari

Professor: Dr. Svetlana A. Mitrofanova

Moscow, 2023

Introduction

In the landscape of business and operational excellence, methodologies like Six Sigma, the Toyota Production System (TPS), and Lean Management have emerged as pivotal frameworks, each offering unique approaches to achieve process efficiency, quality improvement, and overall organizational effectiveness. This comparative analysis seeks to explore and contrast these methodologies across their aims, methodologies, and instruments utilized to drive continuous improvement and operational excellence.

Comparison between Six Sigma, Toyota production system (TPS) and lean management

Factor	Six Sigma	Toyota Production System (TPS)	Lean Management
Aim (Purpose)	Aims to reduce defects and variations in processes, products, and services by focusing on quality improvement, customer satisfaction, and cost reduction.	Aims to eliminate waste, promote continuous improvement, and achieve efficiency by focusing on standardization, just-in-time manufacturing, and respect for people.	Aims to maximize value by eliminating waste, improving efficiency, and delivering high-quality products or services while engaging all levels of the organization in continuous improvement.
Methodology (Steps of Realization)	DMAIC (Define, Measure, Analyze, Improve, Control) methodology used to identify problems, measure process performance, analyze data, implement improvements, and control variations.	Uses concepts like Just-In-Time (JIT), Jidoka (automation with a human touch), and Kaizen (continuous improvement) to optimize production through waste reduction, standardized work, and respect for people.	Adopts principles such as identifying value, mapping the value stream, creating flow, establishing pull, and continuously seeking perfection through waste elimination and continuous improvement.
Instruments (Tools for Reaching the Aim)	Tools include statistical analysis, control charts, root cause analysis, process mapping, and measurement systems analysis to reduce variations and improve quality.	Tools encompass Kanban, Andon, 5 Whys, Poka-Yoke, Heijunka, and visual management to ensure smooth production flow, error prevention, and problem identification.	Tools consist of 5S, Kaizen events, Value Stream Mapping (VSM), Just-In-Time (JIT), Total Productive Maintenance (TPM), and visual management to eliminate waste and improve efficiency.