

# **Improving the Efficiency of a Production Line in an Alcohol Manufacturing Company Located In Jamaica**

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## **Abstract**

Manufacturing is the production of goods from raw materials on a large-scale using labor, tools and processes; it requires both people and machines to accomplish these goals. (Kenton, 2020). Manufacturing is important to the Jamaican economy and it contributes 21% to GDP. (Jamaican Manufacturing Association (JMA), 2018). The aim of the study is to increase the efficiency of the production line (Line 1), for a local manufacturing company. This is to analyze the current layout of the line, to determine the major factors affecting the productivity levels for 750 ml rum and evaluate these factors affecting the production capacity. To make recommendations on improving the efficiency with the application of line balancing techniques.

To achieve these objectives, we had to conduct interviews with data analysis for quantitative data on the line. Interact with technical quality team and observation of the process to acquire information on the quality issues present on the line. The Line was observed over several weeks and timer was used to capture time for each workstation. Several factors were observed, such as: speed of line (bottle per minute), The number of operators online, the number of workstations, the process flow, operating shifts and time, critical station on the line, idle time cycle time. In course of line balancing, the number of workstation and idle time were minimized to maximize the efficiency of the production line.

## **Keywords**

Manufacturing, line balancing, operators, productivity, work station cycle time, efficiency.

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## **Biographies**

JUNIOR A. BENNETT, P.E, CMfgE, CMfgT, M.Sc. B.Ed, SYL, MJIE, MSME

Mr. Bennett is a consultant and Industrial Engineering Lecturer, Undergraduate research supervisor, Leader for the UTech Ja Productivity Research Group and Industrial Work Experience Coordinator for the School of Engineering at the University of Technology, Jamaica. He has been lecturing in the areas of physics, mathematics, engineering, and management for over a decade. He is the First Jamaican to be certified as a Manufacturing Engineer (CMfgE) by the Society of Manufacturing Engineers (SME) in the USA. He is credited for the establishment of the UTech Ja Society of Manufacturing Engineering Student Chapter S430 and served as Faculty Advisor for four consecutive years. In 2019, Mr. Bennett was the recipient of the UTech Ja President Award for Outstanding Community Service. He has been inducted as one of Jamaica's Productivity Ambassador by the Jamaica Productivity Centre and periodically writes for The Sunday Gleaner as guest columnist for Engineers' Angle. He is a corporate member of the Jamaica Institution of

Engineers (JIE) and a registered industrial engineer with the Professional Engineering Registration Board (PERB). He holds a Master of Science in Manufacturing Engineering Systems from the Western Illinois University. He is the representative of the Jamaica Institution of Engineers (JIE) on the National Commission for Science and Technology in Jamaica. His research interests are productivity improvement, operations research, manufacturing, and quality control management.

Jermaine N Bailey is an experienced electrical and mechanical technician, with over 14 years in this area of expertise. He has served as a team leader for 9 years in facility management and maintenance of complex systems. He presently holds certifications in Electrical Inspection (NVQJ), Electrical Installation and Electronics (NVQJ), Electrical Maintenance (NVQJ), Fire Warden (Jamaica Fire Brigade), Associate in Engineering Portmore Community College Jamaica, and presently final year in Industrial Engineering at the University of Technology Jamaica. He is a business man that operate and own Surf Link Internet Café and Imperium Technical Services. His goal is to apply extensive experience in installation of equipment, processing and management. He offers strong technical and methodical aptitude with an innate ability to analyse and synthesize data. Ambitious self- starter, eager to gain hands-on experience in a system that embraces creativity and innovation. He believes in one motto that; “Knowledge gives confident, confidents give power, and power gives you the world”.

Ricardo Scott is a final year student at the University of Technology. He has a diploma in the field of Electrical Engineering, and he is presently pursuing a bachelor’s degree in Industrial Engineering at School of Engineering. He strongly believes that whatever he starts he must see it through to end. He is dedicated, adaptive, ambitious, strategic and a believer that there is a solution to every problem. He is an avid reader of all kinds especially in leadership, inspirational and books on life lessons. His passion is to improve things and make better people. Ricardo is an active youth leader where he and his wife teaches young people the realities of becoming a purpose driven adult.

Wilbert Clarke is a student at the University of Technology Jamaica pursuing a Bachelor of engineering in Industrial Engineering.

Shawn McLaren is a student at the University of Technology Jamaica, pursuing his final studies for a Bachelor of Engineering in Industrial Engineering.