

# Case Study on Using a Time Study Project to Improve Manufacturing Efficiency and Safety

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## Abstract

A time study project is conducted to analyze the effects of a canning factory's production floor designs. Several factors are considered in this study, including production times, safety, and financial aspects. Four team members observed the process of conducting the time study using the "Stopwatch Method" and the "Real-Time Camera." Both methods were used independently to ensure higher accuracy. The original floor plan was used to calculate the production times while considering the losses from machine downtime. Then, the times are compared to a newly designed floor plan. With the stopwatch, the team collected data times implemented into the mathematical equations to determine digital evidence without peripheral distractions. After the mathematic calculations were completed, the team moved to the video of the entire process during an actual production time during 1st, 2nd, and 3rd shifts. The video showed the amount of time wasted when employees and maintenance. It is also seen several risks of losing workers due to forklift traffic. The team brainstormed a new floor plan to be implemented. After calculating and comparing the two floorplans, the new floor plan indicated that rerouting the walkway allowed for less downtime, a shorter distance between work areas, and a higher level of safety and production. The new design would enable machine operators to move faster between locations and reduce the number of cans lost.

## Keywords

Time study, Value Added, Operations Efficiency, Technology Management, Quality Assurance.

## Acknowledgments

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## Biographies

**Mahmoud Al-Odeh**, is a full professor at Bemidji State University (BSU) . He has taught Operations, Technology, & Project Management courses since 2012. Before joining BSU, he worked at Indiana State University as a faculty in the Applied Engineering and Technology Management department for two years. He started his professional career in the industry as Broadcasting Quality Improvement Manager. Dr. Al-Odeh has been an award winner twice: In 2019, he received "The 2019 Strengthening Bonds to Industry Award" by the Association of Technology, Management and Applied Engineering (ATMAE) to recognize his contributions to connect education with industries. In 2017, he received the Spirit of BSU Award for his outstanding effort in organizing the Student Achievement Conference (SAC) at Bemidji State. He is a member of ASQ, PMI, and ATMAE. Dr. Al-Odeh is Lean Six Sigma Black Belt certified. Dr. Al-Odeh's research areas are Statistical Quality Control, Value Stream Mapping, Lean Manufacturing, and Supply Chain Management. As a lean six sigma certified, Dr. Al-Odeh works with local industries to help them produce more products and provide more services with less effort and fewer resources. His goal is to help industries become more efficient in their day-to-day operations and move in the desired direction to reach their goals.

**Dr. Al-Odeh** is recently recognized and listed on the "Professors to Know in Engineering Management Programs". The list comprises outstanding professors and universities in acknowledgment of their great contributions to academia. Dr. Al-Odeh published a Resource Manual to Support Operations Project Managers "Economics and cost Analysis for Operations and Project Managers." He wrote this textbook to help professionals and learners prepare financial analyses of alternatives using spreadsheets. He has been teaching cost estimating for more than ten years, and he

realized the need for a contemporary textbook in the subject. Therefore, he developed a textbook that fits the needs of this generation of learners, millennials, and beyond. Dr. Al-Odeh has been selected to be the chairperson for the School of Technology at Eastern Illinois University starting on July 1 2022. He is looking to bring more strength to the programs by focusing on more collaboration with local industries and organizations.