



IEOM Society International

The Third Asia Pacific Conference on Industrial Engineering and Operations Management

Johor Bahru, Malaysia, September 13-15, 2022

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Certificate of Presentation

This is to certify that

Sri Hartini, Nurin Salwa Nabila, Faradhina Azzahra, Heru Prastawa and Yusuf Widharto
Department of Industrial Engineering, Diponegoro University, Prof Soedarto
Tembalang, Semarang, Indonesia

Delivered an Oral ID 598 "Lean manufacturing to improve the efficiency in a small and medium enterprise: case in tofu production processes" Presented at the Third Asia Pacific IEOM Malaysia Conference.

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Stefani Anggraini, Etsa Astridya Setiyati, Satria Fadil Persada, Mardhatilah Shanti, Bigraf Triangga, Febby Candra Pratama, Hera Rachmahani, Audio Valentino Himawan Marhendha and Mufida Sekardhani, Entrepreneurship Department, BINUS Business School Undergraduate Program Bina Nusantara University, Jakarta, Indonesia

ID 625 Adaptive Reuse the Old House into Restaurant: Space, Nostalgic, and Economic Value

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ID 626 Supplier Performance Analysis in Food Industry: A Data Envelopment Analysis and Statistical Approach

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ID 627 Social Media for Society 5.0: Nostalgia Function and Social Connectedness

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ID 628 Trunk Injection as Green Technology to Improve Rubber Latex Production of *Hevea brasiliensis*

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ID 629 Application of the Polder System in Flood Management in Urban Areas a Case Study

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ID 630 Effect Digital Marketing and Product Quality to Purchasing Decision

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ID 632 Quality Control Management with Six Sigma Approach to Minimize Defects in The Invitation Paper Production Process

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ID 633 Risk Management and Control to Identify Potential Work Accidents in the Production Floor Area

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ID 635 Work-Life Balance in Women Engineers

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ID 640 The Role of System User Training and Personal Technical Skills to Improve Accounting Information System Performance

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ID 641 Design Improvement Strategy of Operational Performance Loading Unloading Containers Using SWOT and ANP Methods

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ID 642 The Role of Leaders during Organizational Change Caused by Covid-19 and Digitalization

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ID 644 The Effect of Total Asset Turnover Ratio, Return on Asset, and Dividend Policy on The Investment Opportunity Set (IOS)

Lean Manufacturing to Improve the Efficiency in A Small and Medium Enterprise: Case in Tofu Production Processes

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Abstract

Lean manufacturing has been widely applied in companies and proven to improve operational performance. Lean is mainly applied to the automotive industry. However, now it has been widely applied in other sectors by considering the characteristics of the application field, including the agro-food sector. The purpose of this study is to evaluate the production process in SMEs, which is still done conventionally. The research begins by using value stream mapping to identify inefficiencies. The results of current-value stream mapping state that the efficiency of the production process is 71.34%. The failure mode effect analysis results state that the critical waste that occurs is overprocessing, waiting, and transportation time. Proposed improvements are made by applying the 5S concept, layout design of the production area, and mechanization of the boiling and filtering processes. Efficiency in future value stream mapping is estimated to increase by around 20%.

Keywords

Lean manufacturing, Value stream mapping, Failure mode effect analysis, Agro-food industry, Tofu.

1. Introduction

Tofu is a soy-based food that provides protein requirements for humans. In addition to being a good source of bioactive compounds, including isoflavones and soy saponin, tofu is also a rich source of vitamins, minerals, and healthy fats. Consuming tofu can lower the risk of several illnesses, such as hypertension, hyperlipidemia, hypercholesterolemia, arteriosclerosis, coronary heart disease, breast cancer, and other conditions (Q. Zhang et al. 2018). Tofu may reduce the risk of CHD in women (X. Zhang et al. 2003) and decreases lipogenesis in the liver via regulating gene expression, which could lower serum lipid levels (Takahashi and Konishi 2011).

Besides the several benefits of consuming tofu, it also has a delicious taste and affordable price for all levels of society. It causes that tofu includes as a popular food in Indonesia. The average tofu consumption in Indonesia grew from 7,956 kg per person in 2020 to 8,216 kg per person in 2021 (Badan Pusat Statistika 2021). Following the rise in tofu consumption, small tofu-producing businesses in Indonesia have emerged. One of the small and medium enterprises (SME) that produces tofu in Indonesia is Eko Budi's home industry in the village of Sugihmanik, Tanggunharjo, Grobogan, East Java.

Based on the preliminary observation in Eko Budi's home industry, it was indicated that there was time wasted during the tofu production process. The researchers indicated that set-up time in several processes took a long time. The percentage between set-up time and total production time in the boiling and frying processes was 59% and 49%, respectively. Besides, there was often a waiting time in the filtering process of 3-4 minutes if the tofu porridge in the previous process had not been processed. In addition, tofu production ran conventionally. The filtering process is done manually by humans as much as 50-60 times a day. The waste during the tofu production process led to an inefficient process.

The Development and Validation of a Mathematical Model of Output in A Manufacturing System

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Abstract

The construction of mathematical models includes a variety of strategies for closing the gap between the model and real-time data. This study uses a data mining technique to expand mathematical model construction to include simulation optimization. At the same time, this procedure is used to verify the mathematical model. In addition to dynamic property validation, the paper suggests mathematical programming as a static property validation method. The validated mathematical model is compared and examined with real-time data, and the results show that the mathematical model applies to real-time systems. The mathematical model has a low error margin estimate and can be used to forecast. The paper's main contribution is to investigate simulation optimization, mathematical programming, and mathematical models to handle the increasing complexity of variables to improve prediction capabilities and lay a solid foundation for tackling factory planning issues.

Keywords

Simulation model validation, simulation optimization, mathematical programming validation, mathematical model validation, output's mathematical model

1. Introduction

Much research has addressed the mathematical model in manufacturing systems (Abazari et al., 2012; Bagheri and Bashiri, 2014; Leitão and Restivo, 2008; X. Li et al., 2010; Shen and Yao, 2015). The issues of mathematical model development relate to integrating multiple variables and various constraints into one mathematical model and model effectiveness under a real-time system's unpredictable and dynamic nature. To find a solution to the issue, many researchers studied various methods to develop a mathematical model that narrows the gap between the model and the real-time data. The existing methods are data mining (Arif et al., 2013; Chincholkar and Herrmann, 2008; Kim

A Mathematical Modelling Approach for a Sustainable Closed Loop Supply Chain Network Design

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Abstract

Due to increasing concern of environmental degradation by various supply chain activities such as sourcing, transportation, inventory holding, manufacturing, and distribution, industries have begun redesigning their supply chain network to integrate recycling and reuse of product returns. The combination of the forward movement of goods from raw materials to the end user and the reverse movement of goods from the end user to the manufacturer, or even back into raw materials through recycling is entitled as Closed Loop Supply Chains (CLSC). In this paper a multi objective Mixed Integer Linear Programming (MILP) model is developed to determine the optimal locations of the facilities and the distribution of flows between the facilities in the CLSC. The sustainability goals addressed in this research include minimizing cost (economic goal), minimizing carbon emission (environment goal) and maximizing the employment (social goal). The proposed MILP has been validated using a randomly generated data set.

Keywords

Closed Loop Supply Chains, Mixed Integer Linear Programming, Sustainability, Carbon emission, social goal.

Biography

Nusrat T. Chowdhury is an Assistant Professor, in the School of Technology, Art and Design at the Bemidji State University Minnesota, USA. She earned her bachelor's and Master's in Industrial and Production Engineering from Bangladesh University of Engineering and Technology, Bangladesh, and PhD in Industrial and Manufacturing System Engineering from University of Windsor, Ontario, Canada. Her research interest is in the areas of Supply Chain and Inventory Management, Computer Aided Process Planning (CAPP), Operations Research, and Computational Complexity.

Assessing E-Customer Loyalty in Relation to Customer Satisfaction during COVID-19 Pandemic using M-S-Qual Model

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Abstract

This paper extends the research on understanding of the essence and specification, as well as the relevance of the online service industry that affects customer loyalty in relation to their satisfaction in the Philippine context. Quantitative method was utilized in the study by quantifying four hundred Filipino online shopper's respondents to provide a comprehensive information of which from 9 dimensions of mobile service quality (Efficiency, System Availability, Content, Privacy, Fulfillment, Responsiveness, Compensation, Contact, and Billing) positively affects the customer satisfaction and understand the level of customer loyalty under the covid-19 pandemic. The results were drafted and analyzed using Service Quality Gaps, Ordinal Logistic Regression, and Spearman Correlation Analysis. The modified model found the surge of online sales under the pandemic can impact the overall expectation and perception of customers towards online shopping. It is further concluded that the significant factors that have a major influence on the customer satisfaction and loyalty are efficiency, fulfillment, and content. The results also suggest that the customer's loyalty are antecedents of customer satisfaction.

Keywords

Customer Loyalty, Serv-Qual, Mobile Service Quality, Customer Satisfaction, Spearman Correlation Analysis

1. Introduction

Online shopping platforms are growing rapidly and has become a trend for business ideas in the Philippines with the emerging technology of m-commerce, especially during the time of pandemic. The demand for online shopping for a wide variety of products, from essential goods to luxury goods has been rapidly increasing. The greatest challenge for mobile service providers is the delivery of high-quality service (Veloso et al., 2017). A strategic objective based on services is a crucial success factor for survival in a strong competitive e-environment (Rita et. al., 2019). In this regard, mobile service providers pay particular attention to monitoring and improving service quality that significantly influence customer satisfaction and loyalty, which are determinant variables in maximizing profit and establishing competitive edge (Elizar et. al., 2020). The quality improvement greatly influences customer satisfaction and loyalty, in both manufacturing and service industries. It implies that companies must first receive a favorable response from its customer before customer satisfaction and loyalty is established (Yusra and Agus, 2019). Mobile service providers aiming to deliver excellent services must consider how users view their mobile services, and this awareness includes a way of evaluating the efficiency of their services (Huang, 2015). However, it is still critical for service providers to have a good and clear understanding of exactly what the customer expectations and perceptions. In a continuously changing world, the expectation of customers changes rapidly. (Pankaj, et al., 2018). It has become imperative for service providers to assess whether they meet customer needs and expectations which is measured by aspects like online service quality, satisfaction and loyalty to customers. Numerous studies in the service industry have investigated that service quality is a significant antecedent of satisfaction (Cronin and Taylor, 1992; Veloso et al., 2017; Zaibaf et al., 2012; Zhang and Prybutok, 2005). The key to customer satisfaction lies in identifying and assessing customer perception and expectation (Parasuraman, et.al., 1985).