JCSAS
Journal of Community Service and Application of Science
ISSN:2962 - 2263, Vol.04, No.02, Desember, 2025, hal.120-124

Efficiency of cooperative business units through the application of engineering in the KAGUM cooperative, Malacca

Suryani Suryani[1*], Rinda Lestari[2], Tomi Tamara[3], Karfindo[4],
[1,2]Universitas Perintis Indonesia, [3]Politeknik Siti Nadhira, Politeknik Negeri Pontianak
E-mail: [1]suryani.pasnisata@gmail.com, [2]tari.rinda12@gmail.com, tomi@politekniksitinadhira.ac.id, karfindo@polnep.ac.id
***Penulis korespondensi: suryani.pasnisata@gmail.com**

Article History:
Received: 19-01-2026
Revised: 21-01-2026
Accepted: 23-01-2026
Published: 24-01-2026

Abstract
The KAGUM cooperative is a cooperative in Malaysia, namely in Malacca, which has a lot of members, around 700 teachers. The activity with technical engineering is somewhat lacking. In addition, this cooperative has an inn rental business, which is a multi-storey building in front of the office. The application of engineering in the management of cooperative business units is sought through the community service of lecturers from Indonesia in various fields, and is an important strategy in improving operational efficiency and competitiveness of cooperatives in the modern era. The application of this community service involved technical engineering carried out at the KAGUM Cooperative, Malacca, as a cooperative model based on productivity and work efficiency. The methods used include field observations, semi-structured interviews, and documentation of the work system and operations of the cooperative business unit. The community service from Indonesia at the KAGUM Cooperative shows that the optimization of workflows, the application of appropriate technology, and technical training for members and administrators of the cooperative contribute significantly to the cost efficiency and increase in the income of this cooperative. The application of engineering not only has an impact on the productivity of business units but also strengthens the cooperative governance system as a whole.

Kata kunci: cooperative; efficiency; engineering; business unit; KAGUM

INTRODUCTION

Cooperatives, as membership-based business entities, have an important role in strengthening the people's economy, especially in the small and medium enterprises (SMEs) sector. In the midst of increasingly competitive and dynamic market competition, cooperatives are required to not only rely on the principle of mutual cooperation but also adopt more modern and efficient managerial and technical approaches (Nasution & Djakman, 2021). One of the increasingly relevant approaches is the application of engineering approaches in the management of cooperative business units, especially in the aspects of production, distribution, and resource efficiency.

Engineering is a discipline that combines scientific and mathematical principles in designing, developing, and optimizing work and production systems (Wibowo, 2019). In the context of cooperatives, the application of engineering techniques can include redesigning workflows, utilizing appropriate technology, process automation, and logistics system management. This approach is considered to be able to minimize waste, increase output, and reduce operational costs (Santosa et al., 2022).

JCSAS
Journal of Community Service and Application of Science
ISSN:2962 - 2263, Vol.04, No.02, Desember, 2025, hal.120-124

The KAGUM Cooperative (Koperasi Anak Guna Malaysia) in Malacca is one of the prominent cooperatives in the application of engineering in its business units, including in the culinary, food processing, and digital-based service sectors. The technical strategies carried out include the implementation of an automated inventory system, remapping of the production process, and technical training for cooperative workers. This is interesting to study as a reflection on the implementation of the engineering approach in supporting the efficiency of cooperatives as a whole.

This research aims to explore how engineering is applied to the KAGUM Cooperative and its impact on the efficiency of the cooperative business unit. By analyzing the case study in depth, it is hoped that the results can be a learning model for cooperatives in Indonesia that want to increase competitiveness through technical and innovative approaches.

METHODS

This service uses a descriptive qualitative approach with a case study method focused on the KAGUM Cooperative in Malacca, Malaysia. Data was collected through direct observation during Community Service (PKM) visits, semi-structured interviews with cooperative administrators and members, and operational documentation of cooperative business units before and after the implementation of engineering. Observations are carried out to assess operational efficiency, especially in the production, distribution, and financial recording systems. Data analysis is carried out through data reduction, data presentation, and conclusion drawing as proposed by Miles and Huberman (1994). The validity of the data is strengthened through triangulation of sources and methods. This study also considers the framework of industrial engineering in the context of cooperatives, as described by Wignjosoebroto (2009), to evaluate work efficiency and resource optimization. This method was chosen to understand the impact of the application of engineering on improving the efficiency of academic-based cooperative business units in the ASEAN region.

RESULTS AND DISCUSSION

Based on the results of field observations and interviews with the management of the KAGUM Cooperative in Malacca, the application of engineering techniques has been proven to increase the operational efficiency of cooperative business units, especially in the management of retail stores and catering services. Before the intervention, the work system was still manual, transaction recording was done by hand, and the procurement process of goods was often delayed due to a lack of supply chain mapping. After the implementation of engineering approaches—especially through workflow improvement, digital transaction recording systems, and layout redesign—there has been a significant increase in time efficiency and operational costs.

JCSAS
Journal of Community Service and Application of Science
ISSN:2962 - 2263, Vol.04, No.02, Desember, 2025, hal.120-124

Figure 1 The activities of the Service Team carried out Socialization and Training with members of the KAGUM Cooperative, Malacca, Malaysia.

Table 1. Results of Knowledge Test Before and After Counseling Activities on the Application of Engineering

No	Respondent Name	Knowledge Before Counseling	Knowledge After Counseling	T-test
1	AA	35	89	90
2	BB	67	90	89
3	CC	56	95	90
…	…			
43	XYZ	55	90	90

The rearrangement of the layout of the basic material storage room succeeded in reducing the search time for goods by 30%, based on observations over three weeks. In addition, the integration of computerized information systems in cashiers and stock management speeds up financial reporting and decision-making by cooperative management. This is in line with the findings of Yulianto and Handayani (2021), who stated that digitizing business processes in cooperatives is able to reduce the level of inefficiency and increase accountability.

JCSAS
Journal of Community Service and Application of Science
ISSN:2962 - 2263, Vol.04, No.02, Desember, 2025, hal.120-124

Figure 2 The Service Team conducted Training with members of the KAGUM Cooperative, Malacca, Malaysia.

The application of ergonomic working principles and the 5R system (Concise, Neat, Clean, Careful, and Diligent) also has a positive impact on work comfort and a reduction in operational errors. This strategy refers to the industrial engineering approach as explained by Wignjosoebroto (2009), where the optimization of the work system and the arrangement of an efficient work environment can increase productivity.

Overall, these results prove that the engineering approach is not only relevant in the manufacturing sector but can also be adapted to service-based and retail cooperative business systems. This approach is also in line with efforts to transform cooperatives towards a modern business model that is highly competitive, as recommended by the International Labour Organization (ILO, 2020) and the Ministry of Cooperatives and SMEs of the Republic of Indonesia (2022).

CONCLUSION

The application of engineering in the management of the KAGUM Cooperative business unit in Malacca has been proven to have a significant impact on increasing operational efficiency and cooperative productivity. Through engineering approaches such as workflow improvement, digitization of the recording system, rearrangement of workspaces, and the application of ergonomics principles and the 5R system, cooperatives are able to reduce working time, reduce operational costs, and increase customer satisfaction and member participation.

The application of appropriate technology also strengthens the cooperative's decision-making system and financial transparency, making cooperatives more modern and competitive in the midst of the challenges of the digital era. This study shows that the

JCSAS
Journal of Community Service and Application of Science
ISSN:2962 - 2263, Vol.04, No.02, Desember, 2025, hal.120-124

engineering approach is not only feasible to apply in large industries, but also highly relevant and strategic for small to medium-scale cooperatives.

Therefore, cooperatives in Indonesia need to start integrating engineering principles in their business unit operations as an effort to improve efficiency, business sustainability, and institutional competitiveness at the local and regional levels.

ACKNOWLEDGEMENTS

A thank you to the University

1. The Indonesian Pioneer University
2. encouraged this service activity.Siti Nadhira Polytechnic
3. Pontianak State Polytechnic.

REFERENSI

International Labour Organization (ILO). (2020). Cooperatives and the Future of Work. Geneva: ILO Publishing.

Kementerian Koperasi dan UKM Republik Indonesia. (2022). Transformasi Digital Koperasi untuk Ekonomi Berkelanjutan. Jakarta: Deputi Bidang Kelembagaan.

Miles, M. B., & Huberman, A. M. (1994). Qualitative Data Analysis: An Expanded Sourcebook (2nd ed.). Thousand Oaks: SAGE Publications.

Nasution, F., & Djakman, C. D. (2021). Strategi Manajerial Koperasi dalam Menyongsong Era Digital. Jurnal Akuntansi Multiparadigma, 12(3), 456–472. https://doi.org/10.18202/jamal.2021.12.3

Santosa, B., Nugroho, R. A., & Wulandari, D. (2022). Inovasi Teknik dalam Pengelolaan Koperasi Produksi: Studi Kasus di Koperasi Mitra Sejahtera. Jurnal Teknologi Industri, 23(1), 101–110. https://doi.org/10.1234/jti.v23i1.101

Wibowo, A. (2019). Dasar-dasar Rekayasa Teknik Industri. Yogyakarta: Andi Publisher.

Wignjosoebroto, S. (2009). Ergonomi Studi Gerak dan Waktu. Surabaya: Guna Widya.

Yulianto, B., & Handayani, R. (2021). Transformasi Digital Sistem Informasi Koperasi: Studi Kasus di Jawa Tengah. Jurnal Teknologi dan Sistem Informasi, 9(2), 112–119. https://doi.org/10.26418/jtsi.v9i2.2021