JLP : Jurnal Lentera Pengabdian
Volume 04 No 04 Oktober 2026
E ISSN:2985-6140

https://lenteranusa.id/

Introducing Data-Driven Export Decisions to MSMEs: A Community Seminar on Machine Learning and Trade Services

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Received : 20-10-2026 Revised : 05-11-2026 Accepted : 10-11-2026 Published : 16-11-2026

Abstract
Micro, small, and medium enterprises face practical challenges in using sales, inventory, customer, and market information to inform export-related decisions. This community seminar introduced participants to the roles of data, machine learning, reliable measurement, and trade services in interpreting business information and considering export-market requirements. The activity was conducted during Trade Expo Indonesia 2026 in Tangerang and attended by 77 entrepreneurs, exporters, producers, marketing managers, service providers, and business consultants. The seminar comprised three expert presentations, a moderated panel discussion, and a question-and-answer session. The sessions addressed the use of internal and external business data, the potential of machine learning for identifying patterns, reliable measurement and data traceability, and trade services for market access and risk mitigation. The documented discussion record showed recurring participant concerns regarding inventory and pricing decisions, customer-review classification, quality standards, packaging requirements, harmonized system codes, and export-market selection. These observations suggest that participants viewed data use not as a stand-alone technological task, but as connected to compliance, market information, and practical business judgment. The seminar provides a descriptive account of community engagement around data-driven export decisions; it does not measure changes in knowledge, skills, or business performance.

Keywords: community engagement, export readiness, machine learning, MSMEs, trade services

Introduction

Micro, small, and medium enterprises play an important role in economic activity, job creation, and the development of local products with the potential to enter global markets. However, export opportunities are not determined solely by product quality. Entrepreneurs must also be able to understand market needs, identify target customers, set appropriate prices, manage inventory, and comply with trade standards and regulations. In rapidly changing markets, business decisions based solely on intuition may lead to overproduction, inaccurate pricing, ineffective promotional spending, and unsuitable export-market selection.

Digital transformation offers entrepreneurs opportunities to utilize data from sales transactions, customer behavior, inventory, customer reviews, market trends, and digital promotional activities. Such data can be transformed into information that helps businesses identify demand patterns, estimate inventory requirements, evaluate promotional effectiveness, and prioritize potential markets. The Organisation for Economic Co-operation and Development stated that the use of digital technologies and data by small businesses has become increasingly important for improving productivity, business resilience, and adaptability to changes in the business environment (OECD, 2024).

Machine learning is one approach that can support more systematic data processing. This technology can identify patterns in historical data and generate predictions or recommendations to support business decisions. In the context of micro, small, and medium enterprises, data analytics and machine learning can be adopted gradually through orderly sales recording, inventory monitoring, customer segmentation, product-trend analysis, and demand forecasting. Anwar et al. (2024) found that big data analytics adoption is associated with improved decision quality among small and medium enterprises. Nevertheless, technology cannot generate optimal results when the underlying data are inaccurate, incomplete, or not traceable.

Digital readiness, innovation capability, human resource skills, and business ecosystem support also determine the success of artificial intelligence adoption among small and medium enterprises. Arroyabe et al. (2024) emphasized that digital and internal innovation capabilities play important roles in encouraging artificial intelligence adoption. Therefore, entrepreneurs should not merely be introduced to technology. They also need practical knowledge of how to integrate data, business experience, and external support into actionable decisions.

Previous MSME capacity-building programs have commonly focused on digital promotion, social-media use, and online sales channels. These initiatives are important because they help entrepreneurs expand market communication and access digital platforms (Alfian et al., 2023; Darodjat & Utarie, 2022; Abdullah et al., 2026). However, promotional capability alone does not address several export-related decisions that require entrepreneurs to interpret sales and inventory information, assess product and measurement reliability, understand standards and harmonized system codes, and connect market signals with trade-service support. The practical gap addressed by this seminar was therefore the need to introduce these interconnected decision areas in one forum rather than treating digital promotion, business data, and export readiness as separate topics.

The seminar entitled *"Turning Data into Global Market Opportunities: How Machine Learning and Trade Services Strengthen Small and Medium Enterprise Decision-Making"* was held as part of Trade Expo Indonesia 2026. It involved 77 attendees, including entrepreneurs, exporters, producers, marketing managers, service providers, and business consultants. The seminar introduced data-driven export decision-making by combining discussion of business data, machine learning, reliable measurement, and trade services. This article descriptively documents the delivery of the seminar and the participant discussion themes recorded during the panel and question-and-answer session; it does not evaluate changes in participants' knowledge, skills, or business performance.

Method

This article used a descriptive documentation approach to report the implementation of a community seminar. The approach was selected because the available evidence consisted of activity records, attendance information, presentation materials, photographs, and the moderator's written summary of the panel discussion and question-and-answer session. The study did not use a participatory research design, a probability sample, or pre- and post-intervention measurement.

The seminar was held on October 15, 2026, from 3:30 p.m. to 5:30 p.m. Western Indonesia Time at Garuda Room 6B, Indonesia Convention Exhibition BSD, Tangerang, as part of Trade Expo Indonesia 2026. Participants were recruited through the seminar registration and attendance process managed by the event organizer. All 77 individuals who attended the seminar were treated as activity beneficiaries and are described in this report. They were not recruited as a sample intended to represent a wider population.

The seminar consisted of three presentations and a moderated panel discussion. The first presentation introduced trade services, including market intelligence, business matching, digital marketing, logistics, and trade consulting. The second presentation discussed the use of business data and the potential of machine learning to support pattern recognition and business decisions. The third presentation addressed reliable measurement, data traceability, quality requirements, and trade standards. The panel and question-and-answer session connected these topics with participants' practical concerns.

The documentary dataset included: (1) the attendance record; (2) the seminar agenda and presentation materials; (3) activity photographs; and (4) the moderator's written record of questions, comments, and discussion points. The discussion record was reviewed using a structured extraction matrix containing the session topic, documented participant concern, related business issue, and practical implication. The extracted points were then grouped through descriptive thematic coding. The three final themes were data and information quality, standards and regulatory compliance, and business technology use. These themes were retained because each was supported by documented discussion points in the moderator's report. No audio recording or verbatim transcript was used; therefore, the analysis reports documented themes rather than the frequency or intensity of individual participant contributions.

The findings are presented narratively and through tables and photographs. Table 1 reports the documented participant profile, Table 2 presents the seminar content and its expected learning outcomes, and Table 3 presents the traceable discussion themes and related practical implications.

Results

The community service activity was conducted as an interactive seminar entitled *"Turning Data into Global Market Opportunities: How Machine Learning and Trade Services Strengthen Small and Medium Enterprise Decision-Making."* The seminar was held on October 15, 2026, at Garuda Room 6B, Indonesia Convention Exhibition BSD, Tangerang, as part of the Trade Expo Indonesia 2026 series.

The activity involved 77 participants, including entrepreneurs, exporters, producers, marketing managers, service providers, and business consultants. The diversity of participant backgrounds indicated that the need for data-driven decision-making is relevant not only to

businesses at an early stage but also to stakeholders supporting business development and market expansion.

Table 1. Documented Profile of Seminar Participants

Participant category	Number of participants	Percentage
MSME owners or entrepreneurs	42	54.5
Exporters or producers	15	19.5
Marketing managers	8	10.4
Trade-service providers	6	7.8
Business consultants	6	7.8
Total	77	100

Source: Source: Seminar attendance and registration records, 2026.

The activity was designed around three complementary presentations. The first perspective emphasized trade services as a bridge between local products and global market opportunities. The second focused on using business data and machine learning to generate business recommendations. The third explained the importance of reliable measurement as the foundation of trustworthy data before it is used in analytical processes.

Table 2. Seminar Learning Components and Expected Learning Outcomes

Activity component	Main topic	Expected learning outcome
Trade services	Market intelligence, business matching, digital marketing, logistics, and trade consulting	Participants are introduced to market-access support and export risk-mitigation services
Data and machine learning	Sales, inventory, customer, and market-trend data as business inputs	Participants are introduced to the use of data for identifying patterns and informing operational decisions
Reliable measurement	Accuracy of weight, volume, dimensions, temperature, quality, and data traceability	Participants are introduced to the importance of valid data and compliance with trade standards
Panel discussion	Data, business experience, market signals, and business judgment	Participants are invited to consider how technology and practical business context can be balanced

Source: Seminar agenda and presentation materials, 2026.

The moderator's written discussion record documented questions and comments on three recurring issues. First, participants discussed how customer reviews and business records could be organized into usable information for repeat-order and inventory decisions. Second, participants raised concerns regarding quality standards, packaging requirements, harmonized system codes, and the selection of export destination markets. Third, participants discussed the use of data analytics for inventory, pricing, and promotion while recognizing the continuing role of business judgment. Table 3 presents these documented discussion themes and their practical implications.

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Table 3. Documented Discussion Themes and Practical Implications

Discussion theme	Evidence documented in the discussion record	Practical implication
Data and information quality	Questions on classifying customer reviews and maintaining business records for repeat-order decisions	Consistent records can provide a basis for reviewing customer responses and sales patterns
Standards and regulatory compliance	Questions on quality standards, packaging requirements, harmonized system codes, and target markets	Export planning needs to incorporate product compliance and market-entry requirements
Business technology use	Discussion of data analytics for inventory, pricing, and promotion	Technology may support business judgment but does not replace contextual knowledge of products and markets

Source: Moderator's written panel and question-and-answer summary, 2026.



Figure 1. Implementation of the Seminar on Strengthening SME Export Decision-Making through Machine Learning
Source: Activity documentation, 2026.



Figure 2. Panel Discussion and Participant Question-and-Answer Session
Source: Activity documentation, 2026.

Discussion

The documented discussion themes indicate that participants connected machine learning and data use with three practical areas: the quality of business information, compliance with trade requirements, and the use of technology in everyday business decisions. Because the evidence is based on attendance records, activity documentation, and the moderator's written discussion summary, this interpretation is descriptive. It does not establish the level of participant knowledge, the effectiveness of the seminar, or changes in business practices. Nevertheless, the documented themes show that participants' questions extended beyond technology adoption to include market context, product standards, and access to trade services.

The systematic recording of transactions, inventory, customer complaints, and promotional responses is an essential first step before businesses implement more complex analytics. Inconsistent data may lead to inaccurate recommendations. Therefore, the emphasis on reliable measurement in the seminar was highly relevant. Accuracy in weight, volume, quality, and product information not only supports internal decision-making accuracy but also builds market confidence and enhances business readiness to meet trade requirements.

The discussion on inventory, pricing, and promotion showed that participants viewed machine learning mainly in terms of its practical benefits. At an early stage, entrepreneurs can use data to identify the most demanded products, peak sales periods, customer purchase patterns, and inventory items requiring priority management. In line with Anwar et al. (2024), data analytics utilization has the potential to improve business decision quality when it is supported by technological, organizational, and environmental readiness.

A practical illustration can clarify the limited but useful role of machine learning for a small exporter. For example, a snack producer may compile twelve months of weekly sales data, product type, selling price, promotion status, stock availability, destination city, and customer orders. A simple forecasting model can use these data to estimate the likely demand for each product in the following month. The output may indicate that one product has increasing demand in a particular city during promotional periods, while another product has repeated stock shortages. This information can support decisions about production quantities, inventory replenishment, promotional timing, and the prioritization of products for market testing. This example is illustrative only and was not implemented or evaluated in the seminar.

From a market expansion perspective, trade services play a strategic role in translating market information into actionable steps for entrepreneurs. Market intelligence helps identify market requirements, while business matching, digital marketing, logistics, consulting, and assistance with standards can reduce barriers along the path to export. This is consistent with Arroyabe et al. (2024), who explained that digital and internal innovation capabilities need to be strengthened through ecosystem support so that artificial intelligence adoption can generate more tangible benefits for small and medium enterprises.

The seminar served as a valuable initial step in raising participants' awareness. However, capacity building would have a greater impact if it were followed by practical training, business data clinics, digital-recording assistance, and export-readiness consultations. This continuous approach would help participants transform conceptual understanding into data-driven business management practices.



Figure 3. Group Photograph of Participants and Speakers
Source: Activity documentation, 2026.

This finding is also consistent with previous community service initiatives that emphasized the importance of digital-business strategies, technology utilization, and practical assistance for micro, small, and medium enterprises. Alfian et al. (2023) highlighted the role of digital business strategies in opening market opportunities for small businesses, while Darodjat and Utarie (2022) demonstrated the use of digital technology to support sales optimization among farmers and micro, small, and medium enterprises. Similar community service programs have also shown that training in artificial intelligence-based promotional content, digital marketing, creative content production, and digital storytelling can strengthen the digital capacity and market communication of micro, small, and medium enterprises (Abdullah et al., 2026; Abdullah & Perkasa, 2025; Abdullah & Febrian, 2025; Febrian et al., 2025).

Conclusion

The seminar delivered an integrated introduction to data use, machine learning, reliable measurement, and trade services for 77 attendees at Trade Expo Indonesia 2026. The activity documentation and moderator's written discussion summary identified three recurring themes: data and information quality, standards and regulatory compliance, and the use of business technology for inventory, pricing, and promotion decisions.

The available evidence supports a descriptive conclusion about seminar delivery and participant discussion themes only. It does not demonstrate improvements in participants' knowledge, export readiness, technology adoption, or business performance. Future community-service activities should therefore combine practical training and mentoring with a clearly documented evaluation design, such as pre- and post-training assessments, task-based exercises, and follow-up observation of business practices. This would allow future studies to assess whether an integrated approach to data, machine learning, measurement, and trade services contributes to measurable export-readiness outcomes.

Acknowledgments

The authors would like to express their sincere gratitude to the Center for Export and Trade Services Human Resource Development, the Trade Human Resource Development Agency, Ministry of Trade of the Republic of Indonesia, for their support and facilitation of the seminar as part of Trade Expo Indonesia 2026. Appreciation is also extended to all speakers, moderators, organizing committee members, and participants for their active contribution to the activity.

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