Recruitment of TikTok Live Hosts for Selling Clothes Using the MOORA Method

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Abstract. Mistakes in recruiting Hosts for the business of selling clothes on TikTok live streaming can have a negative impact on business owners, because Host failure can cause the products offered not to sell to potential customers. To overcome this problem, a decision support system is needed as a support tool for clothing selling entrepreneurs in recruiting TikTok Live Hosts that are relevant and can contribute to the development of their business. In this study the authors used Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) for the TikTok Live Host recruitment process with 5 (five) alternatives and 5 assessment criteria in subjective decision making. The results of this study indicate that the alternative that gets the first ranking position and is recommended to be accepted as a TikTok Live Host is A5 (Rina) with a value of 0.2752. As for the ranking order of other alternatives, namely A1 (Janses) with a value of 0.2738 at rank 2, A3 (Aisyah) with a value of 0.2582 at rank 3, A4 (Kylen) with a value of 0.2460 at rank 4, and A2 (Delima) with a value of 0.2190 at rank 5.

Keywords: Decision Support System, Host Live TikTok, MOORA, Recruitment

1 Introduction

In today's technological era, many entrepreneurs choose to sell clothing products through social media called TikTok. This is influenced by the popularity of TikTok which has managed to get a lot of attention from the wider community in Indonesia. The process of selling clothes on TikTok is generally carried out by utilizing the live streaming feature which provides space for TikTok Live Hosts and potential customers to interact with each other [1]. Live TikTok hosts have a very important role in increasing the income of clothing selling entrepreneurs through live broadcasts because they can have a significant influence on the interest of potential customers to buy the products offered. Mistakes in recruiting Hosts for a clothing selling business on TikTok live streaming can have a negative impact on business owners, because the Host's failure to promote the product being sold can reduce buying interest in potential customers [2]. To overcome these problems, a Decision Support System is needed as a supporting tool for clothing selling entrepreneurs in recruiting TikTok Live Hosts that are relevant and can contribute to the development of their business.

A decision support system is a system that is able to provide solutions to problems with semi-structured and unstructured conditions [3]–[5]. Decision support systems can be used to help make decisions that no one knows how to solve with certainty [6]–[8]. In a decision support system, a decision-making method must be applied to provide accurate and reliable results. In this study the authors applied the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) method to recruit TikTok Live Hosts for Selling Clothes.

MOORA is a method with a minimal and simple calculation process. MOORA method has good selectivity in identifying alternatives. The approach adopted by the MOORA method is defined as the process of optimizing two or more conflicting constraints simultaneously [9]–[11]. In previous research by Bella Putri Hapsari and Saifur Rohman Cholil in 2022 the MOORA method was used to solve the problem of giving employee bonuses. The results showed that the MOORA method provides accurate results in determining the results of decision making to help decision makers [12]. Mirna Ananda Putri, et al. in 2022 applied the MOORA method to solve the problem of selecting suppliers of building materials. The results showed that MOORA made it easier for decision makers to choose building material suppliers through ranking alternatives [13]. Mohd. Siddik, et al. in 2023 has used the

MOORA method in his research to solve the problem of selecting watches involving 15 alternatives and 5 criteria. [14].

2 Research Method
2.1 Host Live TikTok

TikTok Live Host is someone who plays an active role in guiding activities carried out on TikTok live streaming [15]. On TikTok live streaming, hosts can interact with viewers who can become potential customers to buy the product being promoted [16]. Hosts on TikTok live streaming must have high credibility in order to increase buying interest in potential consumers [17].

2.2 Multi-Objective Optimization on The Basis of Ratio Analysis (MOORA)

Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) is a decision-making method with a minimal and simple calculation process. The MOORA method has good selectivity in identifying alternatives. The approach adopted by the MOORA method is defined as the process of optimizing two or more conflicting constraints simultaneously [9]–[12].

The stages carried out based on the provisions of the MOORA method in solving decision-making problems can be seen in the visualization of Figure 1 below [10], [12], [13]:
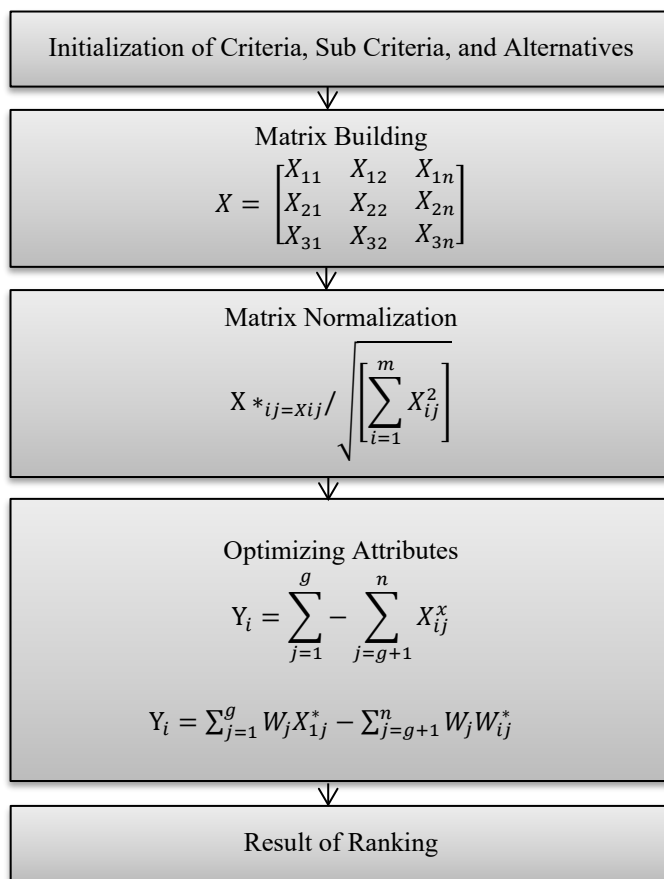
Initialization of Criteria, Sub Criteria, and Alternatives

Matrix Building

$$X = \begin{bmatrix} X_{11} & X_{12} & X_{1n} \\ X_{21} & X_{22} & X_{2n} \\ X_{31} & X_{32} & X_{3n} \end{bmatrix}$$

Matrix Normalization

$$X*_{ij=Xij} / \sqrt{\left[\sum_{i=1}^{m} X_{ij}^2 \right]}$$

Optimizing Attributes

$$Y_i = \sum_{j=1}^{g} - \sum_{j=g+1}^{n} X_{ij}^x$$

$$Y_i = \sum_{j=1}^{g} W_j X_{1j}^* - \sum_{j=g+1}^{n} W_j W_{ij}^*$$

Result of Ranking

Figure 1. Decision Making Stage Using the MOORA Method

2.3 Research Stages

The stages of research conducted by the author to solve the problem of recruiting TikTok Live Hosts to sell clothes using the MOORA method in this study can be seen in Figure 2. below:
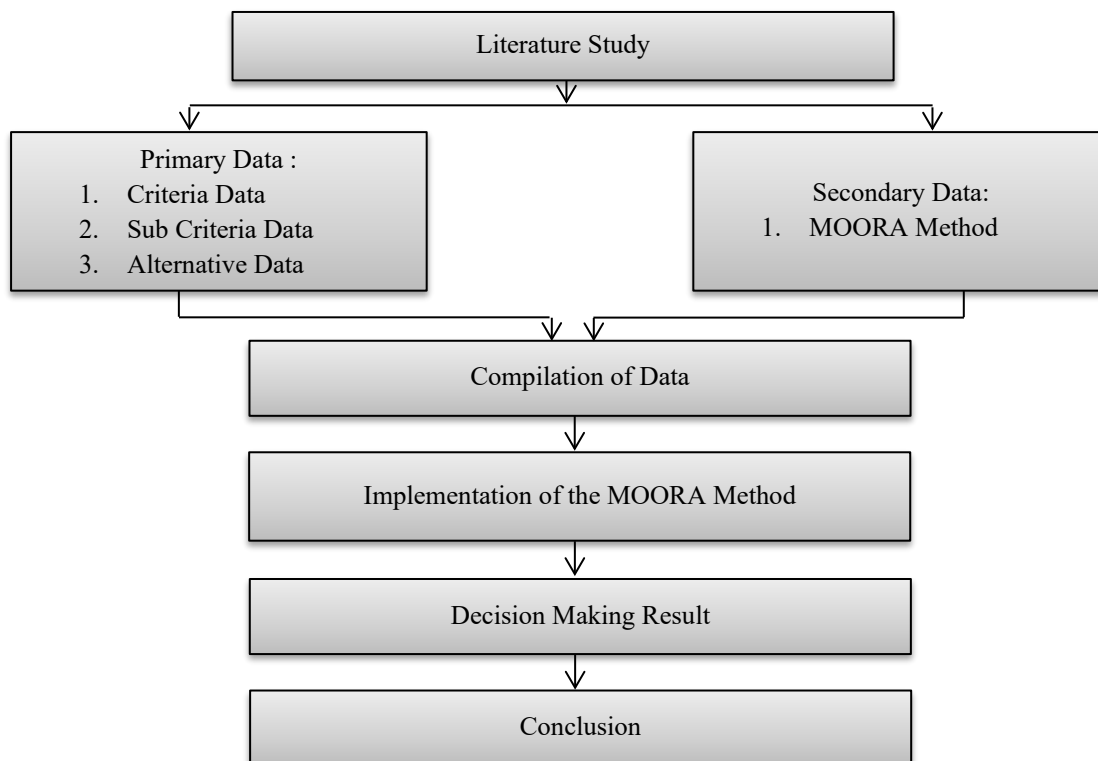
Figure 2. Research Stages

3 Results And Discussion
3.1 Research Data

From the results of the literature study conducted by the author to solve the problem of recruiting TikTok Live Hosts to sell clothes using the MOORA method, the following sample data is known:

Table 1. TikTok Live Host Recruitment Criteria Data

Code	Criteria	Weight (%)	Description
C1	Last Education	22	Benefit
C2	Age	21	Cost
C3	Speaking Skills	20	Benefit
C4	Appearance	19	Benefit
C5	Understanding of Clothing Products	18	Benefit

Table 2. TikTok Live Host Recruitment Sub Criteria Data

Code	Criteria	Subcriteria	Weight (%)
		S1	40
C1	Last Education	D3	35
		SMK/SMA	25
		19 – 23	40
C2	Age	24 – 28	35
		29 - 33	25
		Very Good (VG)	40
C3	Speaking Skills	Good (G)	35
		Enough (E)	25
C4	Appearance	Very Good (VG)	40

		Good (G)		35
		Enough (E)		25
		Very Good (VG)		40
C5	Understanding of Clothing Products	Good (G)		35
		Enough (E)		25

Table 3. Alternative Data in TikTok Live Host Recruitment

No	Alternative	Criteria				
		C1	C2	C3	C4	C5
1	Janses	S1	28	VG	E	G
2	Delima	SMA	19	G	VG	E
3	Aisyah	SMK	29	E	G	VB
4	Kylen	D3	22	G	E	G
5	Rina	S1	26	G	G	E

3.2 Implementation of the MOORA Method

The results of solving the TikTok Live Host recruitment problem for selling clothes using the MOORA method in this study can be seen in the description below:

a. Matrix Building
   The results of matrix formation in solving the problem of recruiting TikTok Live Hosts to sell clothes using the MOORA method in this study, namely:

$$X = \begin{bmatrix} 40 & 35 & 40 & 25 & 35 \\ 25 & 40 & 35 & 40 & 25 \\ 25 & 25 & 25 & 35 & 40 \\ 35 & 40 & 40 & 25 & 35 \\ 40 & 35 & 40 & 35 & 25 \end{bmatrix}$$

b. Matrix Normalization
   The results of matrix normalization in solving the problem of recruiting TikTok Live Hosts to sell clothes using the MOORA method in this study, namely:

$C1 = \sqrt{40^2 + 25^2 + 25^2 + 35^2 + 40^2}$
$\quad = \sqrt{1600 + 625 + 625 + 1225 + 1600}$
$\quad = \sqrt{5675}$
$\quad = 75,33259587$
$A_{11} = 40/75,33259587 = 0,5310$
$A_{21} = 25/75,33259587 = 0,3319$
$A_{31} = 25/75,33259587 = 0,3319$
$A_{41} = 35/75,33259587 = 0,4646$
$A_{51} = 40/75,33259587 = 0,5310$
$C2 = \sqrt{35^2 + 40^2 + 25^2 + 40^2 + 35^2}$
$\quad = \sqrt{1225 + 1600 + 625 + 1600 + 1225}$
$\quad = \sqrt{6275}$
$\quad = 79,21489759$
$A_{11} = 35/79,21489759 = 0,4418$
$A_{21} = 40/79,21489759 = 0,5049$
$A_{31} = 25/79,21489759 = 0,3156$
$A_{41} = 40/79,21489759 = 0,5049$
$A_{51} = 35/79,21489759 = 0,4418$
$C3 \;\; = \sqrt{40^2 + 35^2 + 25^2 + 40^2 + 40^2}$
$\quad = \sqrt{1600 + 1225 + 625 + 1600 + 1600}$
$\quad = \sqrt{6650}$
$\quad = 81,54753215$

$A_{11} = 40/81,54753215 = 0,4905$

$A_{21} = 35/81,54753215 = 0,4292$

$A_{31} = 25/81,54753215 = 0,3066$

$A_{41} = 40/81,54753215 = 0,4905$

$A_{51} = 40/81,54753215 = 0,4905$

$C4 = \sqrt{25^2 + 40^2 + 35^2 + 25^2 + 35^2}$

$\quad = \sqrt{625 + 1600 + 1225 + 625 + 1225}$

$\quad = \sqrt{5300}$

$\quad = 72,80109889$

$A_{11} = 25/72,80109889 = 0,3434$

$A_{21} = 40/72,80109889 = 0,5494$

$A_{31} = 35/72,80109889 = 0,4808$

$A_{41} = 25/72,80109889 = 0,3434$

$A_{51} = 35/72,80109889 = 0,4808$

$C5 = \sqrt{35^2 + 25^2 + 40^2 + 35^2 + 25^2}$

$\quad = \sqrt{1225 + 625 + 1600 + 1225 + 625}$

$\quad = \sqrt{5300}$

$\quad = 72,80109889$

$A_{11} = 35/72,80109889 = 0,4808$

$A_{21} = 25/72,80109889 = 0,3434$

$A_{31} = 40/72,80109889 = 0,5494$

$A_{41} = 35/72,80109889 = 0,4808$

$A_{51} = 25/72,80109889 = 0,3434$

The results of matrix normalization for solving the TikTok Live Host recruitment problem for selling clothes using the MOORA method in this study, namely:

$$Xij = \begin{bmatrix} 0,5310 & 0,4418 & 0,4905 & 0,3434 & 0,4808 \\ 0,3319 & 0,5049 & 0,4292 & 0,5494 & 0,3434 \\ 0,3319 & 0,3156 & 0,3066 & 0,4808 & 0,5494 \\ 0,4646 & 0,5049 & 0,4905 & 0,3434 & 0,4808 \\ 0,5310 & 0,4418 & 0,4905 & 0,4808 & 0,3434 \end{bmatrix}$$

c. Optimizing Attributes

The results of attribute optimization in solving the TikTok Live Host recruitment problem for selling clothes using the MOORA method in this study, namely:

C1

$A_{11} = \mathbf{0,5310} * \mathbf{0,22} = 0,1168$

$A_{21} = \mathbf{0,3319} * \mathbf{0,22} = 0,0730$

$A_{31} = \mathbf{0,3319} * \mathbf{0,22} = 0,0730$

$A_{41} = \mathbf{0,4646} * \mathbf{0,22} = 0,1022$

$A_{51} = \mathbf{0,5310} * \mathbf{0,22} = 0,1168$

C2

$A_{12} = \mathbf{0,4418} * \mathbf{0,21} = 0,0928$

$A_{22} = \mathbf{0,5049} * \mathbf{0,21} = 0,1060$

$A_{32} = \mathbf{0,3156} * \mathbf{0,21} = 0,0663$

$A_{42} = \mathbf{0,5049} * \mathbf{0,21} = 0,1060$

$A_{52} = \mathbf{0,4418} * \mathbf{0,21} = 0,0928$

C3

$A_{13} = \mathbf{0,4905} * \mathbf{0,20} = 0,0981$

$A_{23} = \mathbf{0,4292} * \mathbf{0,20} = 0,0858$

$A_{33} = \mathbf{0,3066} * \mathbf{0,20} = 0,0613$

$A_{43} = \mathbf{0,4905} * \mathbf{0,20} = 0,0981$

$A_{53} = \mathbf{0,4905} * \mathbf{0,20} = 0,0981$

C4

$A_{14} = 0,3434 * 0,19 = 0,0652$

$A_{24} = 0{,}5494 * 0{,}19 = 0{,}1044$
$A_{34} = 0{,}4808 * 0{,}19 = 0{,}0913$
$A_{44} = 0{,}3434 * 0{,}19 = 0{,}0652$
$A_{54} = 0{,}4808 * 0{,}19 = 0{,}0913$
C5
$A_{15} = 0{,}4808 * 0{,}18 = 0{,}0865$
$A_{25} = 0{,}3434 * 0{,}18 = 0{,}0618$
$A_{35} = 0{,}5494 * 0{,}18 = 0{,}0989$
$A_{45} = 0{,}4808 * 0{,}18 = 0{,}0865$
$A_{55} = 0{,}3434 * 0{,}18 = 0{,}0618$

The results of attribute optimization for solving the TikTok Live Host recruitment problem for selling clothes using the MOORA method in this study, namely:

$$Xwj = \begin{bmatrix} 0{,}1168 & 0{,}0928 & 0{,}0981 & 0{,}0652 & 0{,}0865 \\ 0{,}0730 & 0{,}1060 & 0{,}0858 & 0{,}1044 & 0{,}0618 \\ 0{,}0730 & 0{,}0663 & 0{,}0613 & 0{,}0913 & 0{,}0989 \\ 0{,}1022 & 0{,}1060 & 0{,}0981 & 0{,}0652 & 0{,}0865 \\ 0{,}1168 & 0{,}0928 & 0{,}0981 & 0{,}0913 & 0{,}0618 \end{bmatrix}$$

The next stage is the process of calculating the Yi preference value. The calculation results for the Yi preference value are as follows:

Preference Value Yi A1 = 0,1168 - 0,0928 + 0,0981 + 0,0652 + 0,0865 = 0,2738
Preference Value Yi A2 = 0,0730 - 0,1060 + 0,0858 + 0,1044 + 0,0618 = 0,219
Preference Value Yi A3 = 0,0730 - 0,0663 + 0,0613 + 0,0913 + 0,0989 = 0,2582
Preference Value Yi A4 = 0,1022 - 0,1060 + 0,0981 + 0,0652 + 0,0865 = 0,246
Preference Value Yi A5 = 0,1168 - 0,0928 + 0,0981 + 0,0913 + 0,0618 = 0,2752

d. Result of Ranking

The results of alternative ranking based on the Yi Preference value that has been obtained at the previous stage, namely:

Table 4. Result of Ranking

Code	Alternative	Preference Value Yi	Ranking
A1	Janses	0,2738	2
A2	Delima	0,2190	5
A3	Aisyah	0,2582	3
A4	Kylen	0,2460	4
A5	Rina	0,2752	1

Based on the Yi Preference value in the table above, it can be seen that the alternative that gets the first ranking position is A5 (Rina) with a value of 0.2752. As for the ranking order of other alternatives, namely A1 (Janses) with a value of 0.2738 in rank 2, A3 (Aisyah) with a value of 0.2582 in rank 3, A4 (Kylen) with a value of 0.2460 in rank 4, and A2 (Delima) with a value of 0.2190 in rank 5.

4 Conclusion

The conclusions from the results of the research that has been done in solving the problem of recruiting TikTok Live Hosts to sell clothes using the MOORA method in this study, namely:
a. The MOORA method can generate rankings for a subjective decision making.
b. The alternative that gets the first ranking position and is recommended to be accepted as a TikTok Live Host is A5 (Rina) with a value of 0.2752. As for the ranking order of other alternatives, namely A1 (Janses) with a value of 0.2738 at rank 2, A3 (Aisyah) with a value of 0.2582 at rank 3, A4 (Kylen) with a value of 0.2460 at rank 4, and A2 (Delima) with a value of 0.2190 at rank 5.

References

[1] R. Agistiani *et al.*, "Live-streaming TikTok: Strategi mahasiswa cerdas untuk meningkatkan pendapatan di era digitalisasi," *J. Manag. Digit. Bus.*, vol. 3, no. 1, pp. 1–19, 2023, doi: 10.53088/jmdb.v3i1.607.

[2] N. Yurindera, "Minat Beli pada Live Shopping TikTok berdasarkan Sales Promotion dan Influencer Credibility," *J. Esensi Infokom*, vol. 7, no. 1, pp. 85–89, 2023.

[3] A. Susanto, O. Wahid, Hazriani, and Yuyun, "Decision support system on quality assessment of the prospective civil servant's education and training using fuzzy method," *Indones. J. Electr. Eng. Comput. Sci.*, vol. 24, no. 1, pp. 519–529, 2021, doi: 10.11591/ijeecs.v24.i1.pp519-529.

[4] D. Wardani, W. Mahayanti, H. Setiadi, M. Ulfa, and E. Wihidayat, "TATOPSIS: A decision support system for selecting a major in university with a two-way approach and TOPSIS," *J. Teknol. dan Sist. Komput.*, vol. 10, no. 1, pp. 20–25, 2022, doi: 10.14710/jtsiskom.2021.14074.

[5] M. A. K. Harahap, H. Hardisal, A. Ahyuna, and R. Rahim, "Leveraging the Decision Support System and Simple Additive Weighting Method for Optimal Retail Location Identification," *JINAV J. Inf. Vis.*, vol. 3, no. 2, pp. 174–180, 2022, doi: 10.35877/454ri.jinav1485.

[6] C. A. Putri, J. Minardi, and N. Azizah, "Sistem Pendukung Keputusan Pemilihan Makanan Pada Penderita Maag Menggunakan Metode Composite Performance Index (CPI)," *J. Imiah Inform. dan Komput.*, vol. 1, no. 2, pp. 115–121, 2022.

[7] N. Marbun, M. Zarlis, and R. W. Sembiring, "Analisis Kinerja SMARTER Pada Sistem Pendukung Keputusan Pemilihan Tukang Las Terbaik Untuk Menerima Penghargaan," vol. 6, pp. 1282–1289, 2022, doi: 10.30865/mib.v6i3.4095.

[8] A. Yusupa, J. Manullang, N. Marbun, S. Bill, and F. Ginting, "Decision Support System for Determining the Best PAUD Teacher Using the MOORA Method," vol. 1, no. 2, pp. 50–55, 2023, doi: 10.58905/SAGA.vol1i2.101.

[9] M. Siregar, H. Hafizah, and T. Tugiono, "Sistem Pendukung Keputusan Menentukan Unit Kearsipan Terbaik Menggunakan Metode MOORA," *J. Sist. Inf. Triguna Dharma (JURSI TGD)*, vol. 1, no. 2, p. 62, 2022, doi: 10.53513/jursi.v1i2.4818.

[10] R. Dwi Arista, "Multi Objective Optimization in The Basic of Ratio (Moora) In Supporting Decision Making in Measuring Employee Performance Level Case Study PT. Padi Saga Utama," *Int. J. Sci. Technol. Manag.*, vol. 4, no. 1, pp. 204–211, 2023, doi: 10.46729/ijstm.v4i1.698.

[11] M. F. Anshary and S. Yakub, "Decision Support System Pemilihan Wilayah Potensial Dalam Pemasaran Produk Menggunakan Metode MOORA," vol. 2, pp. 229–238, 2023.

[12] B. P. Hapsari and S. R. Cholil, "Sistem Pendukung Keputusan Pemberian Bonus Karyawan Menggunakan Metode MOORA," *J. Ilm. Inform.*, vol. 7, no. 1, pp. 21–28, 2022, doi: 10.35316/jimi.v7i1.21-28.

[13] S. Pendukung *et al.*, "Sistem pendukung keputusan dalam pemilihan supplier bahan bangunan di toko jasa hai ujong rimba menggunakan metode moora," vol. 5, pp. 365–371, doi: 10.47647/jrr.

[14] M. Siddik, P. Ramadhani, and W. Salistiawaty, "Sistem Pendukung Keputusan Pemilihan Jam Tangan Menggunakan Metode MOORA," *Sist. Pendukung Keputusan dengan Apl.*, vol. 2, no. 1, pp. 12–22, 2023, doi: 10.55537/spk.v2i1.115.

[15] G. Aji *et al.*, "Analisis Digital Marketing Tiktok Live sebagai Strategi Memasarkan produk UMKM Anjab Store (Digital Marketing Analysis of Tiktok Live as a Strategy to Market Anjab Store MSME products)," *J. Bisnis dan Pemasar. Digit.*, vol. 2, no. 1, pp. 13–24, 2022, [Online]. Available: https://doi.org/10.35912/JBPD.v2i1.2007

[16] M. Fawaid Pradika *et al.*, "Penggunaan Aplikasi Tiktok sebagai Media Pemasaran Pof Perfume," *J. Educ.*, vol. 05, no. 04, pp. 12807–12820, 2023.

[17] F. F. Rakhmad and Y. B. Kusuma, "Pemanfaatan Live Streaming Dalam Optimalisasi Penjualan Di Pt Behaestex (Studi Kasus Pada Platform Tiktok)," *J. Pengabdi. Kpd. Masy.*, vol. 3, no. 2, pp. 97–100, 2023, [Online]. Available: https://jurnalfkip.samawa-university.ac.id/karya_jpm/index