

DAFTAR PUSTAKA

- [1] M. Amiri, B. Kushwaha, and R. Singh, "Visualisation of global research trends and future research directions of digital marketing in small and medium enterprises using bibliometric analysis," *Journal of Small Business and Enterprise Development*, p., 2023, doi: 10.1108/jsbed-04-2022-0206.
- [2] P. Thaichon, S. Quach, and L. Ngo, "Emerging Research Trends in Marketing: A Review of Australasian Marketing Journal," *Australasian Marketing Journal*, vol. 30, pp. 214–227, 2022, doi: 10.1177/14413582221110450.
- [3] I. Habib, D. Novansyah, R. D. Arianto, H. N. Darmawan, and D. O. Radianto, "Marketing Development Strategy in the Digital Age," *Jurnal Ekonomi, Manajemen, Akuntansi dan Keuangan*, p., 2023, doi: 10.53697/emak.v4i3.1347.
- [4] B. P. K. Bintaro, P. Sokibi, I. Amsyar, and Y. P. A. Sanjaya, "Utilizing Digital Marketing As A Business Strategy," *Startupreneur Business Digital (SABDA Journal)*, p., 2022, doi: 10.34306/sabda.v1i1.79.
- [5] A. R. Amelia and A. V. Widyawati, "Faktor Keberhasilan Kampanye Facebook ADS: Perspektif Para Praktisi Meta Advertising." [Online]. Available: <https://ojs.stiepi.ac.id/index.php/Marketing>
- [6] T. Iankovets and D. Nikolaiev, "Meta Ads digital advertising in social networks," *Scientia fructuosa*, p., 2024, doi: 10.31617/1.2024(157)06.
- [7] S. Dutta, R. Arivazhagan, S. Sengupta, B. Shyamaladevi, and T. Edwin, "Unlocking Online Success: The Crucial Role of Meta Ads Manager in Elevating Content Reach and Engagement for Market Penetration in Digital Marketing Agency," *Journal of Business Strategy Finance and Management*, p., 2024, doi: 10.12944/jbsfm.06.01.04.
- [8] V. Desai, "Fostering Innovation, Integration and Inclusion Through Interdisciplinary Practices in Management," 2019.
- [9] S. Mulasih and A. Saefullah, "Tren Pemasaran Digital: Analisis Perbandingan Platform Media Sosial Facebook Ads Dan Google Ads," *Jurnal Riset Rumpun Ilmu Ekonomi*, vol. 3, no. 1, pp. 89–101, Mar. 2024, doi: 10.55606/jurrie.v3i1.2768.
- [10] A. Neundorff and A. Öztürk, "How to improve representativeness and cost-effectiveness in samples recruited through meta: A comparison of advertisement tools," *PLoS One*, vol. 18, p., 2023, doi: 10.1371/journal.pone.0281243.
- [11] F. Pratama and Indrawati, "Analysis Effectiveness Use of Ads through Meta Ads and Google Ads at MSME fashionlabs.id," *Journal of Advanced Zoology*, p., 2023, doi: 10.17762/jaz.v44i3.1318.
- [12] J. Castleman and A. Korolova, "Why am I Still Seeing This: Measuring the Effectiveness Of Ad Controls and Explanations in AI-Mediated Ad Targeting Systems," *ArXiv*, vol. abs/2408.11910, p., 2024, doi: 10.48550/arXiv.2408.11910.
- [13] S. Arshanapally, K. Green, K. Slaughter, R. Muller, and D. Wheaton, "Use of a Paid Digital Marketing Campaign to Promote a Mobile Health App to Encourage Parent-Engaged Developmental Monitoring: Implementation Study," *JMIR Pediatr Parent*, vol. 5, p., 2022, doi: 10.2196/34425.
- [14] L. Harmider, A. Kutsynskyi, and M. Kutsynska, "Advertising campaign performance evaluation indicators: essential analysis," *Economic Herald of SHEI USUCT*, p., 2022, doi: 10.32434/2415-3974-2022-16-2-129-136.
- [15] P. C. Addo, J. Fang, A. Asare, and N. Kulbo, "Customer engagement and purchase intention in live-streaming digital marketing platforms," *The Service*

- Industries Journal*, vol. 41, pp. 767–786, 2021, doi: 10.1080/02642069.2021.1905798.
- [16] E. E. Y. Amriel and R. R. Ariescy, “ANALISA ENGAGEMENT RATE DI INSTAGRAM,” Dec. 2021.
 - [17] B. Cudmore, J. McCoy, J. Shuhy, and J. Taylor, “Engaging Online Consumers with an Interactive Cost-Per-Action Advertising Model,” *Journal of Internet Commerce*, vol. 8, pp. 288–308, 2009, doi: 10.1080/15332860903467722.
 - [18] H. Moungui, H. Nana-Djeunga, C. F. Anyiang, M. Cano, J. R. Postigo, and C. Carrion, “Dissemination Strategies for mHealth Apps: Systematic Review,” *JMIR Mhealth Uhealth*, vol. 12, p., 2023, doi: 10.2196/50293.
 - [19] E. Khimich, “Key Metrics For Assessing Efficiency Of Online Marketing Communication,” p., 2021, doi: 10.15405/epsbs.2021.07.74.
 - [20] M. López and F. Perales, “MULTIVARIANT ANALYSIS IN VIDEO AD MARKETING CAMPAIGNS FOR WEB TRAFFIC QUALITY OPTIMIZATION,” *Proceedings of the International Conferences on Applied Computing 2022 and WWW/Internet 2022*, p., 2022, doi: 10.33965/ac_icwi2022_2022081021.
 - [21] D. S. Wuisan and T. Handra, “Maximizing Online Marketing Strategy with Digital Advertising,” *Startupreneur Business Digital (SABDA Journal)*, p., 2023, doi: 10.33050/sabda.v2i1.275.
 - [22] M. S. Sahem, “Strategies for Digital Marketing,” *International Journal For Multidisciplinary Research*, p., 2023, doi: 10.36948/ijfmr.2023.v05i06.10692.
 - [23] A. K. Sharma, N. Raparathi, V. V. R. Tripathi, S. Tiwari, and S. Dhote, “Leveraging Digital Advertising to Enhance Online Marketing Strategies: A Research Perspective,” *International Journal of Membrane Science and Technology*, p., 2023, doi: 10.15379/ijmst.v10i3.2738.
 - [24] R. Hermayanto, “Effective Marketing Strategies in Business: Trends and Best Practices in the Digital Age,” *Jurnal Ad’ministrare*, p., 2023, doi: 10.26858/ja.v10i1.45101.
 - [25] E. Sarmiento, “Leveraging Strategic Digital Marketing toward Small Business Utilization,” *Int Multidiscip Res J*, p., 2024, doi: 10.54476/ioer-imrj/790510.
 - [26] A. Ș. Comănescu, “Google Ads, Meta, TikTok, which Is the Best Way of Paid Promotion?,” *Ovidius University Annals. Economic Sciences Series*, p., 2024, doi: 10.61801/ouaess.2023.2.68.
 - [27] R. Gudipudi, S. Nguyen, D. Bein, and S. Kurwadkar, “Improving Internet Advertising Using Click – Through Rate Prediction,” *Human Factors in Software and Systems Engineering*, p., 2023, doi: 10.54941/ahfe1003772.
 - [28] M. Huang and T. Liu, “Subjective or objective: How the style of text in computational advertising influences consumer behaviors?,” *Fundamental Research*, vol. 2, pp. 144–153, 2021, doi: 10.1016/j.fmre.2021.11.004.
 - [29] C. Northcott, R. Curtis, S. Bogomolova, T. Olds, C. Vandelanotte, and R. Plotnikoff, “Should Facebook advertisements promoting a physical activity smartphone app be image or video-based, and should they promote benefits of being active or the app attributes?,” *Transl Behav Med*, p., 2021, doi: 10.1093/tbm/ibab101.
 - [30] C. Northcott, R. Curtis, S. Bogomolova, T. Olds, C. Vandelanotte, and R. Plotnikoff, “Seasonal Differences in the Cost and Engagement of Facebook Advertisements for a Physical Activity Smartphone App,” *American Journal of Health Promotion*, vol. 35, pp. 803–808, 2021, doi: 10.1177/0890117121997304.

- [31] L. Chambers, Y. Malyuta, W. Goedel, P. Chan, C. S. Coats, and K. Allen, "Identifying Effective Components of a Social Marketing Campaign to Improve Engagement With Express Sexual Health Services Among Gay, Bisexual, and Other Men Who Have Sex With Men: Case Study," *JMIR Public Health Surveill*, vol. 10, p., 2024, doi: 10.2196/50944.
- [32] J. F. Hair, G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, and S. Ray, "An Introduction to Structural Equation Modeling," in *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook*, J. F. Hair Jr., G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, and S. Ray, Eds., Cham: Springer International Publishing, 2021, pp. 1–29. doi: 10.1007/978-3-030-80519-7_1.
- [33] M. Casula, N. Rangarajan, and P. Shields, "The potential of working hypotheses for deductive exploratory research," *Qual Quant*, vol. 55, no. 5, pp. 1703–1725, 2021, doi: 10.1007/s11135-020-01072-9.
- [34] S. Nakayama, S. Sekine, and Y. Nagata, "A study of MT systems applied to multivariate regression," p., 2021, [Online]. Available: <https://consensus.app/papers/a-study-of-mt-systems-applied-to-multivariate-regression-nakayama-sekine/f529a2f6d40f51f7b07d7f8b2dbcee87/>
- [35] M. Palma and S. Maggio, "Multivariate Analysis," in *Encyclopedia of Mathematical Geosciences*, B. S. Daya Sagar, Q. Cheng, J. McKinley, and F. Agterberg, Eds., Cham: Springer International Publishing, 2020, pp. 1–8. doi: 10.1007/978-3-030-26050-7_225-2.
- [36] A. Lahti and A. Marie, "Improving brand awareness on social media," SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES, 2023. Accessed: May 13, 2025. [Online]. Available: https://www.theseus.fi/bitstream/handle/10024/817202/Ala-Lahti_Ane-Mari.pdf
- [37] N. Wernerfelt, A. Tuchman, B. T. Shapiro, and R. Moakler, "Estimating the Value of Offsite Tracking Data to Advertisers: Evidence from Meta," *Marketing Science*, vol. 44, no. 2, pp. 268–286, Mar. 2025, doi: 10.1287/mksc.2023.0274.
- [38] P. Martins, F. Cardoso, P. Váz, J. Silva, and M. Abbasi, "Performance and Scalability of Data Cleaning and Preprocessing Tools: A Benchmark on Large Real-World Datasets," *Data (Basel)*, vol. 10, no. 5, p. 68, May 2025, doi: 10.3390/data10050068.
- [39] S. O. Obatola and T. Junjie, "A data-driven approach to grid-connected PV system reliability assessment: Combining deep learning and hybrid optimization," *Energy Reports*, vol. 12, pp. 5582–5593, Dec. 2024, doi: 10.1016/j.egyr.2024.11.041.
- [40] W. Riyadi, Jasmir, and X. Sika, "Comparison Airport Traffic Prediction Performance Using BiGRU and CNN-BiGRU Models," *Jurnal Online Informatika*, vol. 10, no. 1, pp. 12–21, Apr. 2025, doi: 10.15575/join.v10i1.1362.
- [41] J. Domingo and C. Lazaro, "ALGORITHMIC FOREX TRADING : DEVELOPING A PYTHON PROGRAM FOR AUTOMATED TRADING STRATEGIES," Illinois Institute of Technology, Chicago, 2024. Accessed: May 13, 2025. [Online]. Available: <https://upcommons.upc.edu/handle/2117/421824>
- [42] M. S. Khan, Z. Hussain, M. Z. Hasan, and A. Khalid, "Movie Recommendation System Using Euclidean Distance," in *2024 OPJU International Technology Conference on Smart Computing for Innovation and Advancement in Industry 4.0, OTCON 2024*, Institute of Electrical and Electronics Engineers Inc., 2024. doi: 10.1109/OTCON60325.2024.10688032.

- [43] A. Jain and S. Khan, "Optimizing Cost per Click for Digital Advertising Campaigns," Aug. 2021, [Online]. Available: <http://arxiv.org/abs/2108.00747>
- [44] A. Deligiannis, C. Argyriou, and D. Kourtesis, "Building a Cloud-based Regression Model to Predict Click-through Rate in Business Messaging Campaigns," *International Journal of Modeling and Optimization*, pp. 26–31, Feb. 2020, doi: 10.7763/IJMO.2020.V10.742.
- [45] T. Sangsawang, "Predicting Ad Click-Through Rates in Digital Marketing with Support Vector Machines," *Journal of Digital Market and Digital Currency*, vol. 1, no. 3, pp. 225–246, Dec. 2024, doi: 10.47738/jdmdc.v1i3.20.
- [46] O. Vynogradova, R. Dymenko, O. Ihnatenko, V. Darchuk, I. Sovershenna, and A. Snitko, "ENSURING THE FINANCIAL STABILITY OF THE ENTERPRISE WITH PERFORMANCE MARKETING TOOLS," *Financial and Credit Activity: Problems of Theory and Practice*, vol. 3, no. 56, pp. 518–532, Jun. 2024, doi: 10.55643/fcaptp.3.56.2024.4359.
- [47] T. Becker, "Medienmanagement im Marketing-Mix," in *Medienmanagement und öffentliche Kommunikation: Der Einsatz von Medien in Unternehmensführung und Marketing*, T. Becker, Ed., Wiesbaden: Springer Fachmedien Wiesbaden, 2014, pp. 15–133. doi: 10.1007/978-3-658-00887-1_2.
- [48] L. Lebecq, "The Optimization of Online Marketing Campaign Performance Leveraging CPM pricing model," 2022.
- [49] N. Mamontova, V. Myronchuk, M. Denysenko, and O. Levchenko, "BASIC METRICS IN INTERNET MARKETING," 2024, doi: 10.36690/ICEAF-2024.
- [50] A. Deligiannis, C. Argyriou, and D. Kourtesis, "Building a Cloud-based Regression Model to Predict Click-through Rate in Business Messaging Campaigns," *International Journal of Modeling and Optimization*, pp. 26–31, Feb. 2020, doi: 10.7763/IJMO.2020.V10.742.
- [51] M. Olausson, "PREDICTION OF CONVERSION RATES IN ONLINE MARKETING A study of the application of logistic regression for predicting conversion rates in online marketing," Lund University, 2022.
- [52] E. Kurniawati¹, D. Rafikhein, and N. Ayuanti, "INFLUENCE OF PRODUCT AND DIGITAL MARKETING ON PURCHASE DECISIONS: THE MEDIATING ROLE OF CONSUMER SATISFACTION (CASE STUDY OF KAMPUNG LELE KEDIRI)," 2024.
- [53] A. Rachmawati, L. Puji Rahayu, U. Ria Safitri, and H. Purwanto, "PENGARUH DIGITAL MARKETING, KUALITAS PRODUK DAN CITRA MEREK TERHADAP KEPUTUSAN PEMBELIAN," *Jurnal Ilmu Manajemen dan Akuntansi*, vol. 12, no. 2, p. 2024, 2024.
- [54] J. Fathoni, "Influence Of Cashback On Impulse Buying Through Hedonic Shopping Motivation As An Intervening Variable On Shopee Consumers Among Banyuwangi Students," 2024.
- [55] A. U. Ahmad, "A Study of Multicollinearity Detection and Rectification under Missing Values," *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, vol. 12, no. 1S, pp. 399–418, Apr. 2021, doi: 10.17762/turcomat.v12i1s.1880.
- [56] A. Shakir and N. Adzhar, "Incorporating Multiple Linear Regression in Analysing Factors Influencing Consumers Purchase Intention for Online Shopping in Malaysia," *Journal of Advanced Research in Applied Sciences and Engineering Technology*, vol. 47, no. 1, pp. 257–267, May 2025, doi: 10.37934/araset.47.1.257267.

- [57] S. Omondi, "Influence of e-marketing on purchase intention among customers in the information technology industry in Nairobi," 2024. [Online]. Available: <http://hdl.handle.net/11071/15567> Follow this and additional works at: <http://hdl.handle.net/11071/15567>



Lampiran

1. Source Code Analisis Regresi dengan Statsmodel dan Sklearn

```
import pandas as pd
import statsmodels.api as sm
from statsmodels.stats.outliers_influence import
variance_inflation_factor
from sklearn.preprocessing import StandardScaler

# Load data
file_path = r'D:\ TUGAS AKHIR
\All_Data_with_Indicators.xlsx'
df = pd.read_excel(file_path)

# Filter tipe hasil yang diambil
result_types = ['actions:visit_instagram_profile',
'Messaging conversations started']

for r_type in result_types:
    print(f"\n=== REGRESI UNTUK RESULT TYPE:
    {r_type.upper()} ===")

    # Filter berdasarkan Result Type
    subset = df[df['Result Type'] == r_type]

    # Ambil hanya kolom yang dibutuhkan dan buang
    NA
    regression_data = subset[['Results', 'CTR (%)', 'CPR',
    'ER (%)',
    'ThruPlays', 'Frequency', 'CPM (cost
    per 1,000 impressions)', 'Impressions']].dropna()

    if regression_data.empty:
        print("Data kosong setelah preprocessing. Tidak
        bisa melakukan regresi.\n")
        continue

    # Perhitungan Standardized Coefficient

    scaler = StandardScaler()
    X_std = scaler.fit_transform(regression_data[['CTR
    (%)', 'CPR', 'ER (%)',
    'ThruPlays', 'Frequency',
    'CPM (cost per 1,000 impressions)', 'Impressions']])
    y_std =
    scaler.fit_transform(regression_data[['Results']])

    X_std_const = sm.add_constant(X_std)
    model_std = sm.OLS(y_std, X_std_const).fit()

    print("\n=== STANDARDIZED COEFFICIENTS
    (KOEFSIEN BETA) ===")
    print(model_std.summary())
```

```

# Perhitungan Koefisien Asli (Unstandardized)

X = regression_data[['CTR (%)', 'CPR', 'ER (%)',
                    'ThruPlays', 'Frequency', 'CPM (cost per
1,000 impressions)', 'Impressions']]
y = regression_data['Results']
X_const = sm.add_constant(X)

model = sm.OLS(y, X_const).fit()

print("\n=== UNSTANDARDIZED COEFFICIENTS
(KOEFISIEN ASLI) ===")
print(model.summary())

# Multikolinearitas: VIF dan Condition Number

vif_data = pd.DataFrame()
vif_data['Variable'] = X_const.columns
vif_data['VIF'] =
[variance_inflation_factor(X_const.values, i) for i in
range(X_const.shape[1])]

print("\n=== VARIANCE INFLATION FACTOR (VIF)
===")
print(vif_data)

condition_number = model.condition_number
print(f"\nCondition Number:
{condition_number:.2f}")

```