MACHINE LEARNING STRATEGIES FOR CUSTOMER INSIGHTS IN ANTI-CELLULITE LEGGINGS MARKET

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ABSTRACT

Machine learning and strategic analysis were applied to understand customer satisfaction, behaviour patterns and engagement regarding anti-cellulite leggings. The study integrates real review data with synthetic business variables to support segmentation, recommendation prediction and data-driven decision-

MARKET CONTEXT

The activewear market is driven by aesthetics, comfort, influencer impact, pricing sensitivity and social-media behaviour. Customer feedback strongly influences purchasing decisions and retention.

BUSINESS DESCRIPTION

Retailer selling anti-cellulite leggings with focus on digital channels. Objectives: enhance customer understanding, improve recommendation accuracy, optimize marketing efforts and refine product positioning.

IT INFRASTRUCTURE

Python, NumPy, pandas, seaborn, scikit-learn; GitHub for version control; Kaggle dataset with synthetic attributes (price, channel, country). Open-source stack ensures scalable, low-cost analytics.

METHODOLOGY

CRISP-DM framework. Data cleaning, feature engineering (review length, age group), EDA via distributions and correlations. Models trained: Logistic Regression, Random Forest, Gradient Boosting.

RESULTS

Gradient Boosting achieved highest accuracy, precision, recall and F1-score. Key predictors: Rating, Positive Feedback Count, Review Length, Price and Sales Channel.

INTERPRETABILITY & ETHICS

SHAP revealed Rating as dominant predictor. No PII used; GDPR-aligned workflow. Fairness checks performed to avoid bias across age and country segments.

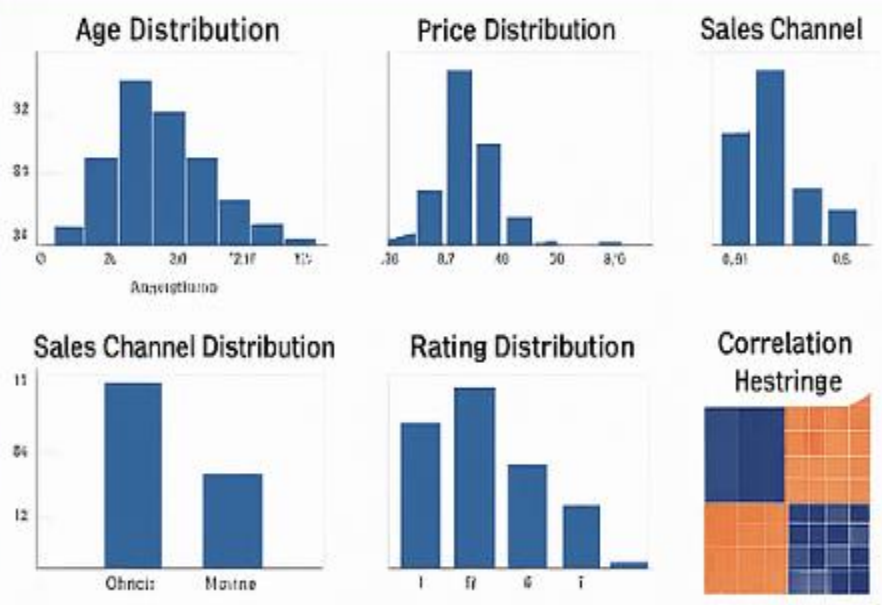
CONCLUSION

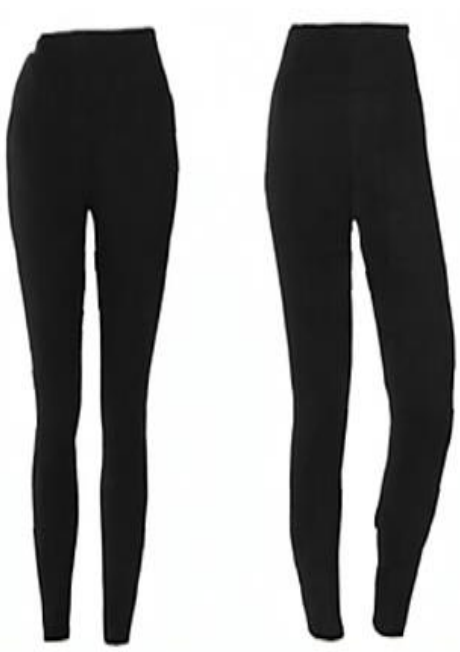
ML insights support targeted marketing, improved segmentation, pricing optimisation and stronger customer satisfaction strategies.

REFERENCES

Breiman (2001); Friedman (2001); Hastie et al. (2009); Kaggle Dataset; Pedregosa et al. (2011).

METHODOLOGY (FIGURES)





RESULTS

- Higher earchases.likely dly less older cusstomers.
- Higher price briltup higherprice, higher rating:
- Higher sales othrough Online channel.

TECHNOLOGIES USED

- Python
- Pandas.
- Scikir-klean
- Seabom