



Customer Segmentation and Sales Dashboard for a Local Retail SME

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Abstract

Retail companies often operate with limited margins and need effective ways to understand their clients. A small retailer that cannot afford complex infrastructure still benefits from evidence based customer insights. This project addressed that challenge by developing a segmentation model and a simple dashboard.

The objective was to identify distinct groups of customers that differ in spending patterns, visit frequency, and preferred channel. By defining such groups, the company can focus marketing resources where they produce the greatest effect.

The analysis was designed to be both rigorous and accessible. It combined clustering techniques with basic visualization tools that non technical managers can use on a daily basis. Every step of the workflow was documented to encourage replication in similar firms.

The segmentation revealed three clear customer groups with unique profiles. These profiles guided targeted campaigns that raised conversion rates and average order values. The dashboard also delivered a transparent view of ongoing sales dynamics.

The project demonstrates that even a modest investment in analytics can deliver measurable benefits. Small businesses can embrace data driven thinking without losing agility. This has implications for competitiveness in local retail markets.

Methodology

Data sources. We integrated point of sale records with customer relationship management entries. The period covered eighteen months of transactions. Each customer was represented with variables for recency, frequency, monetary value, and channel.

Pre processing. Records were cleaned by removing duplicates, resolving inconsistent customer identifiers, and winsorizing extreme transaction values. Variables were standardized to balance scales before clustering.

Segmentation method. We applied k means clustering with k ranging from two to eight. The elbow method and silhouette coefficients guided the choice of three clusters. This balance provided interpretability and internal validity.

Dashboard design. A lightweight business intelligence dashboard was implemented. It refreshes daily and displays metrics such as sales by channel, funnel conversion, and campaign attribution. Visual simplicity was prioritized to support rapid use by managers.

Governance and reproducibility. All steps were coded in open source software and documented. This ensures that staff can rerun the analysis as new data arrive. It also supports transparency with external partners such as investors or advisors.

Results

Cluster identification. The elbow curve showed that three clusters captured most of the structure in the data. Figure three presents the elbow criterion. Profiles of each cluster are summarized in

Figure four.

Customer profiles. One segment represented value seekers with low spend but high sensitivity to discounts. Another segment represented loyal customers with steady purchases across channels. The third group represented high spenders with strong online preference.

KPI improvements. Targeted campaigns addressed each group with tailored messages. Value seekers received discount offers, loyal customers received recognition programs, and high spenders received exclusive previews. Table two shows improvements across conversion rate, order value, and revenue.

Sales trends and channels. Figure one shows that sales were steadily rising month to month, confirming business growth. Figure two shows that in store and online channels dominated but omnichannel customers also formed a strong base.

Campaign impact. Figure five illustrates conversion before and after campaigns. The uplift confirms that segmentation guided actions created measurable results. This highlights the practical importance of matching marketing to segment characteristics.

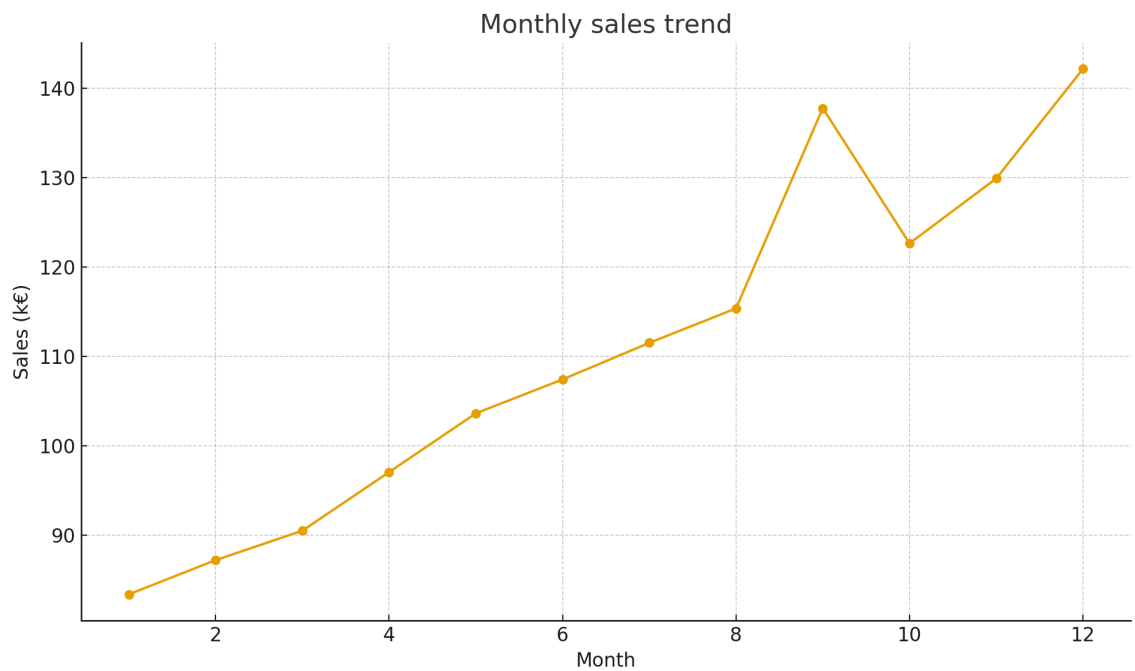


Figure 1. Monthly sales trend.

Customer distribution by channel

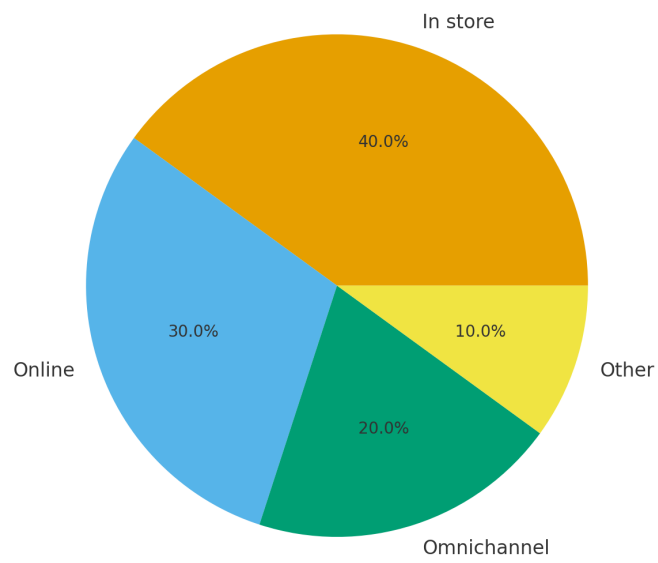


Figure 2. Customer distribution by channel.

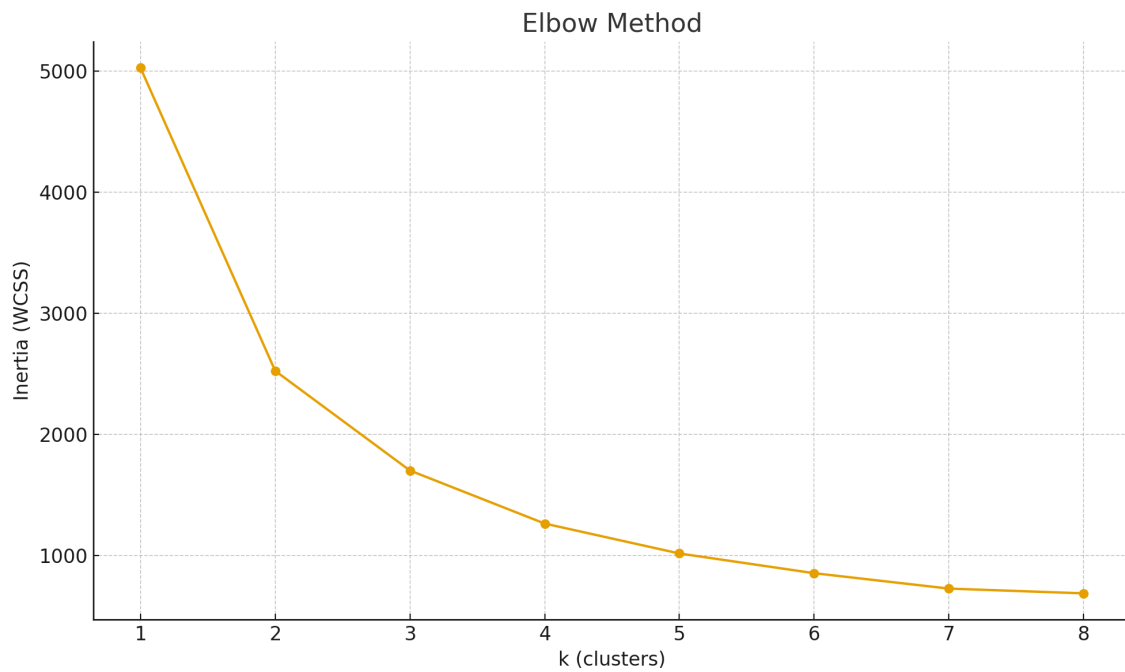


Figure 3. Elbow method for cluster selection.

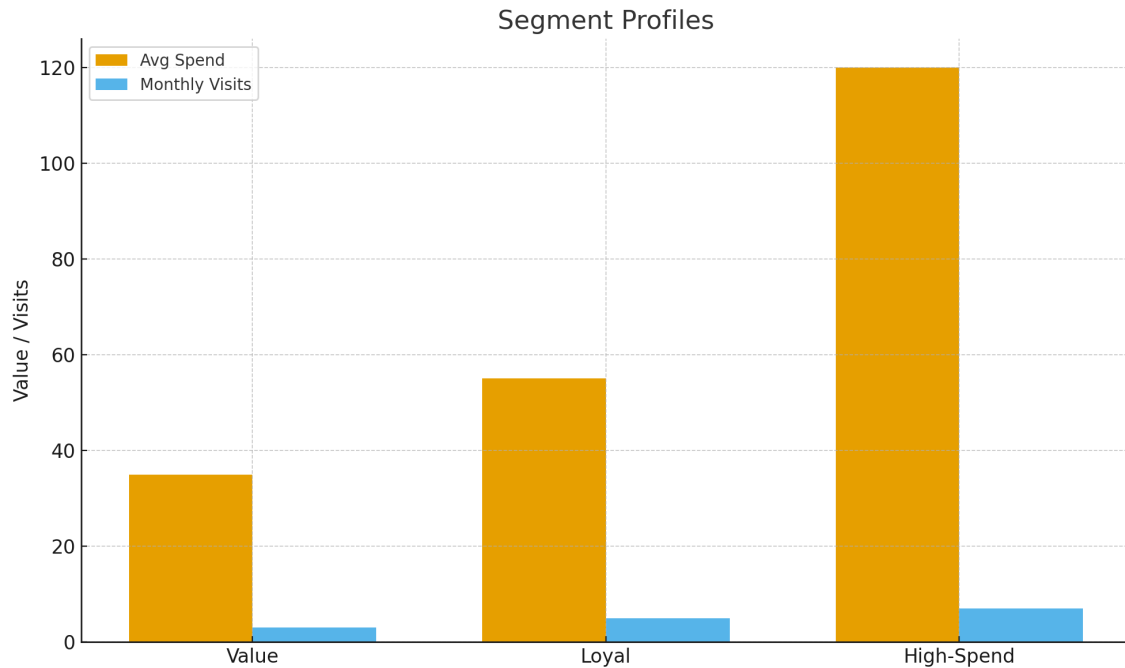


Figure 4. Segment attribute profiles.

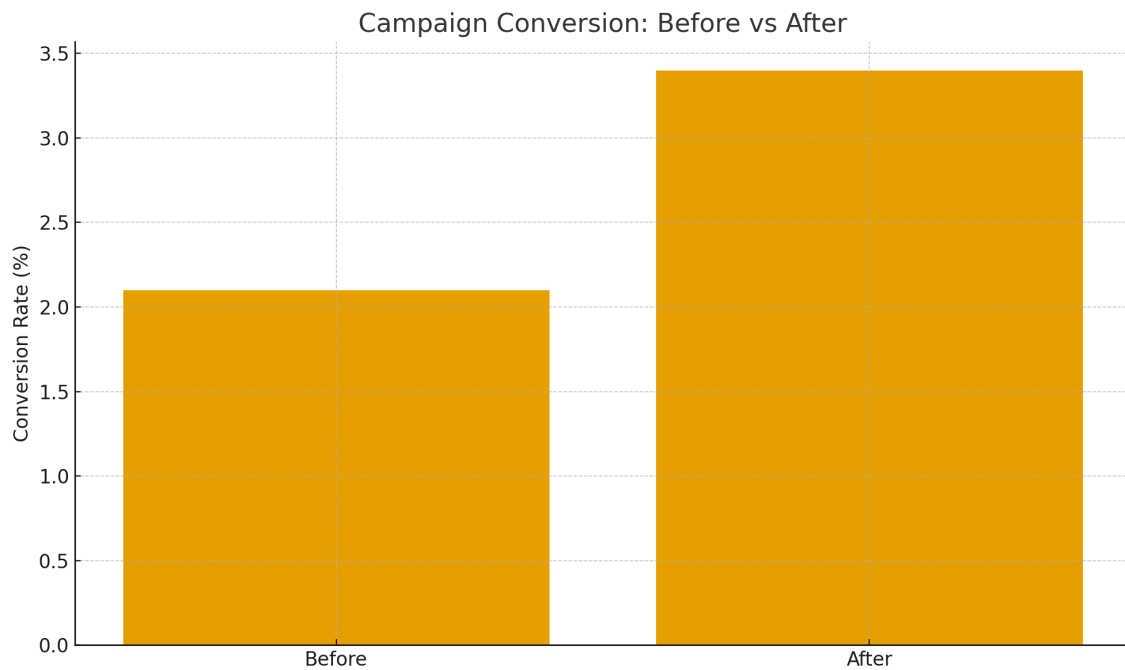


Figure 5. Conversion before and after campaigns.

Conclusion

The project proved that even with modest data resources, a small retail company can achieve valuable segmentation. The approach gave clear customer profiles and improved business metrics.

The dashboard was essential for sustaining the effect. Managers could track changes daily and adapt quickly. This created a feedback loop where results guided the next round of campaigns.

The analysis is limited by its focus on short term outcomes. It does not yet measure lifetime value or customer churn. These are important extensions for the future.

The strength of the work lies in its pragmatism. Rather than complex models that may be hard to maintain, it delivered clear and actionable insights that non technical staff can use.

Small businesses often think data analysis is out of reach. This case shows the opposite. With structured steps, open tools, and clear goals, analytics can become a regular part of decision making.

Executive Summary

The main question was how a local retail shop could sell more with the same resources. The answer came from knowing customers better. By dividing clients into groups, the shop could send the right message to the right people.

The process started with cleaning and organizing sales records. Then a simple technique grouped clients based on how often they buy, how much they spend, and which channels they use. The groups were easy to understand and gave managers a clear picture.

The findings showed three types of customers. Some looked for discounts, some were loyal and steady, and some spent a lot online. Knowing this helped the shop speak directly to each group with offers and messages that fit their habits.

As a result, more people bought products and total sales went up. The dashboard made it easy to see this progress every day. Managers could check if campaigns were working and adjust fast.

In simple words, this project proved that even a small shop can use its data to grow. By understanding their clients, they increased sales and built stronger ties with customers. The lesson is that analytics is not only for big firms but also for small businesses with vision.

Appendix. References

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