

AI Clustering: A Method for Countering Competition

Frank Clayton Schuller, Ignacio Fuentes Ribas

Jameel Clinic for Machine Learning and Health, Massachusetts Institute of Technology, Cambridge, MA, USA
Email: frank515@mit.edu

How to cite this paper: Schuller, F. C., & Ribas, I. F. (2025). AI Clustering: A Method for Countering Competition. *Open Journal of Business and Management*, 13, 3801-3810.
<https://doi.org/10.4236/ojbm.2025.136205>

Received: May 31, 2025

Accepted: October 14, 2025

Published: October 17, 2025

Copyright © 2025 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

As corporations are adopting artificial intelligent (AI) applications into their business operations, particularly in marketing decisions, managers are likely to enlist applications in the formulation of strategy. In fact, several companies in various industries have already been integrating AI applications in determining competitive strategies. This article traces three companies' utilizations of AI in determining competitive reactions to rivals' encroachment on market share. The specific AI technique for the three firms deployed clustering, a process that may uncover latent, unobserved product characteristics.

Keywords

Artificial Intelligence (AI), Strategy Formulation, Competitive Reaction, Clustering, Product Differentiation, Defensive Tactics

1. AI Clustering: A Method for Countering Competition

Companies, particularly those in consumer goods and food staples, have been latching onto the potential of artificial intelligence in developing marketing strategies (Mirwan, Ginny, Darwin, & Ghazali, 2023). The results, especially for sales and marketing, have bolstered managers' confidence in the reliable applicability of AI algorithms. Encouraged by the demonstrated performance of AI, corporate strategists, instead of harnessing AI solely for marketing, have been redeploying particular AI techniques for devising corporate strategies for defensive retaliation.

Quantum Black, a group in McKinsey, evaluated the current usage and expectations for AI implementation in the future in various companies (Singla, Sukharevsky, Yee, & Chui, 2025). The findings indicated that sales and marketing are the predominant uses of AI in enterprise-level companies. Of the companies reviewed, 14% are regularly using generative AI. Following sales and marketing

products and service product development in service followed with 13%. A few companies have already armed themselves with AI applications. The integration of AI in formulating defensive strategies, as well as overall corporate strategies, seems likely to proliferate (Csaszar et al., 2024).

This paper traces three different responses for devising defensive AI-related strategies toward competitors that were encroaching on market shares. Typically, clustering analysis, an AI algorithm, aids companies in formulating marketing strategies to boost sales. The process, as usually deployed, is directed at pinpointing obscure market segments or extracting customer characteristics. Seldom have companies reported deploying clustering analysis for initiating defensive strategies against menacing rivals infringing on market share. Yet, three companies particularized the clustering methodology for competitive analysis in forfending the loss of markets.

2. Clustering Analysis for Defensive Maneuvering

The utility of clustering, which, through neural networks, clumps similar characteristics associated with products (Du, 2010). This AI application facilitates distinguishing specific market segments and customer characteristics. Figure 1 illustrates the distinguishing characteristics of the AI application. In the figure, customer profiles and preferences are divided into two groups. In this case, distinct customer characteristics between two firms in the same industry with diversified products. In essence, the two firms, though competing in principle, are not competing against each other in the same product line. Marketing strategies for each of the two companies, respectively, would continue to devise marketing plans to enhance each respective product line. The assessment assumes that neither firm seeks aggressively to vie for the other's market segment.

Figure 2 illustrates a more complicated rivalry between two competitors. The two firms seem to be crowding into each other's segment of the market. The blue and yellow dots, representing consumer characteristics, overlap in each firm's market segment. Marketing managers must decide on a strategy that accounts for their rivals' behavior. Three generic responses prevail:

1) Intensifying competition against the rival with such alternatives as discount pricing, promotions, advertising, or service.

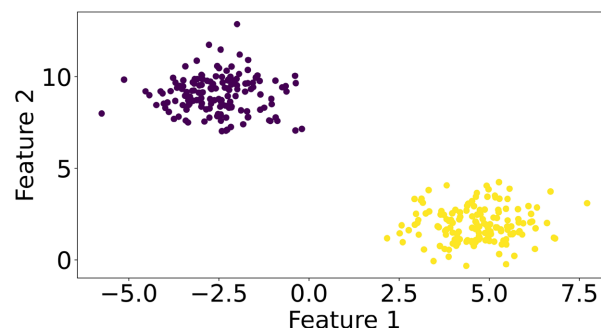


Figure 1. Competition in separate markets.

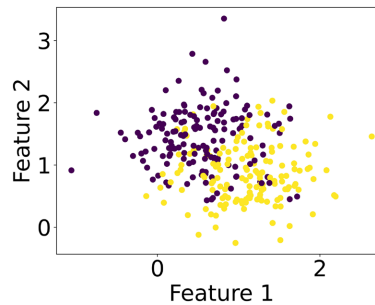


Figure 2. Competition in overlapping markets.

2) Retreating from the market segment to concentrate on the higher-margin core market while ceding the contested sector to the competitor.

3) Innovating with a new product or service that coalesces into a syncretic, labile market segment between the two rivals.

Pros and cons are attached to each strategy. Any one of the strategies incurs risks—risks of market rejection after perhaps substantial marketing costs, erosion of the primary market, or cannibalizing existing market share. Whatever the reactive, effective implementation, whatever corporate decision, as the examples will show, demands penetrating competitive analysis. To some extent, the clustering analysis may guide the decision process.

3. A Trio of Strategic Choices

One strategic option would advocate retaliation with intensified pricing ploys, advertising, and promotions. Such reprisals might restore the foregone market, especially if the competitor's marketing budget is near its constraints or other corporate opportunities generate greater promise elsewhere. Of course, if the competitor is endowed with ample resources, the outcome could devolve into internecine guerrilla warfare that ends in mutual financial loss through attrition without altering market share for either contender (Heil & Helsen, 2001).

Alternatively, as a second option, the firm may elect to cede the contested market instead of chancing the risk of an internecine, costly clash. Instead, managers may determine to allocate resources to expanding the existing lines to attract additional customers or to increase purchases among existing customers. The clustering scatter of data points may bunch around consumer characteristics in a relatively uncontested sub-segment that coincides with the firm's competitive strengths. The retreat from the competing sub-segment would constitute a re-focusing on the primary market rather than a timorous back down from a marketing skirmish with a goading competitor as **Figure 2** suggests (Hauser & Shugan, 1983).

A firm may counter market infringement with a third tactic—innovation with a unique product that galvanizes consumers in the overlapping market. **Figure 3** illustrates a density of consumer characteristics that overlies the market boundary between the two contenders, which could justify designing a novel, market-reorienting product that conforms to those customer characteristics. An innovation

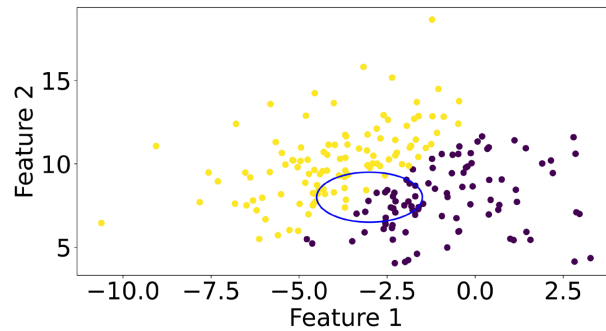


Figure 3. Competition at the boundary between two rival markets.

could precipitate an undetected, camouflaged market segment. Besides invigorating the customer characteristics of both competitors, the innovation could lure additional, latent customers into the market segment.

Risks prevail with the strategy to innovate, particularly with consumer goods. Notably, in the food and beverage industry, customers often leave neoteric products on the shelf. New Coke, Kellogg's Breakfast Mates, Lay's Wow Chips, and Celery-flavoured Jello displeased the taste buds and other sensitivities of consumers. The sponsoring companies misread the preferences and demands in the market.

The possibility of product-bust accounts for only some of the risks, though perhaps the most catastrophic. The introduction of an alternative product could cannibalize existing products. The gain from the expanded product line may simply offset any cannibalized loss in the legacy product from cross elasticity. With presumed market acceptance of the preemptive product, the challenged firms may counter with similar products. One aleatory outcome of internecine actions may counteract gains for both firms. Neither would gain in profitability, although a competitive response from the defensive firm may protect its market share and thwart the ambitious advances of the threatening firm (Sanderson & Uzumeri, 1995).

4. Three Companies: Three Reactions from Clustering Analysis

4.1. The Brewery

A US-based brewery with a national brand distributes in every state, each with disparate regulations. Various state laws differ across borders. Some states, for instance, sell beer in corner convenience stores. Other sales restrict alcohol sales to off-license stores, which require consumers to purchase beverages in supermarkets or in wine and liquor stores. In both markets, brewers vie for market share with such tactics as price, brand loyalty, locations on shelves, and refrigeration cabinets.

Yet, market data was revealing signs of flagging market share amid intensified competition. The company enlisted an AI specialist to profile its customer characteristics and those of competitors, hoping that clustering might discern subtle differences between client bases undetected by conventional marketing research. The brewery would couple the information with clustering with other AI applica-

tions to formulate a comprehensive, integrated marketing strategy.

4.2. The Fruit Company

A multinational operation with farms in Central and South America produces fruit and vegetables for global distribution. The fruit division cultivates such produce as pineapples, bananas, and melons. Each growing season, the company, in consultation with primary clients such as supermarket chains and other high-volume retail stores, dedicates a proportion of each harvest to be sold as fresh produce either under contract to national retailers or the secondary buyers as regional wholesalers or the spot market. The other portion of the crops are canned or packaged for retail outlets. The decision about the relative proportions assimilates many factors—past sales, seasonality, yield of the harvest, and an estimate of competitors' marketing initiatives.

Suspecting that competitors' vigorous marketing campaigns for fresh fruits were chewing into market share in the secondary market, the firm's management, recognizing the potential for extracting obscure consumer data about competitors and their clientele, contracted an AI consulting group to undertake clustering analysis. The insights might elucidate the decision about the proportional split between fresh and canned produce and the relative importance between the primary and secondary markets.

4.3. Men's Toiletry Manufacturer

Deodorants, razors, blades, shaving cream, after-shave, and other masculine-related products—the company manufactures a comprehensive array of products for men. These products lined shelves and point-of-purchase displays in supermarkets, pharmacies, convenience stores, and other types of outlets that men frequent. The shaving products, particularly razors and blades, jockeyed with competitors for market brand loyalty to the company could blunt competitor encroachment temporarily, but in the long run, innovative products would pare down profits and perpetuate market share erosion.

Yet, management discerned contradictory behavior among customers. Some relished new products whose higher prices yielded generous margins. Others showed price sensitivity. Competitors of both types were treading on the company's market share with stringent pricing discounts and popular innovations. Managers drafted an AI consultancy to ferret out potentially subtle, undetected consumer trends and competitors' characteristics with clustering analysis. Competitors were nibbling away at the two distinctive market sectors—the price-sensitive for standardized products and the relatively price-inelastic, latest "techy" design models. Management was questioning how to allocate resources and decide how to counteract competition's trampling on market share.

5. Clustering Analysis: Uncovering the Unexpected

For each firm, competitive clustering analysis spotted unforeseen characteristics

and patterns in the dataset. These nuggets of information, though different for each of the three firms, apprised managers in formulating marketing strategies. These revealed characteristics, kindled insights, and ideas for analysis to competitive responses that they otherwise might have dismissed without the findings from the clusterings.

5.1. The Brewery

The outcome of the clustering analysis jolted management with sobering results. Having witnessed a competitor swallowing up market share, the management of the brewery suspected what the clustering analysis corroborated. The characteristics of the competitors' customers coincided with those of the brewery. One aspect, though, was surprising. Basically, both sets of customers showed indifference between the two domestically mass-produced brands.

To management's dismay, a combination of two factors influenced customer decision—price and convenience of the display. A substantial portion of the imbibers snatched the first bottle or six-pack handily located at a bargain price, particularly outdoor labourers who grabbed a few domestically mass-produced beers after work en route home. The management of the brewery debated fight or flight. The company could the sharing of market share while still striving with marketing ploys to retain its growing proportion of premium lines, also embattled from microbreweries—essentially flight. Alternatively, managers could defy the competitor's audacity with a vigorous redress to reclaim foregone market share.

Managers opted to resist. They perceived an opportunity to drum out much of the competitors' incursion into the brewer's market share. While the clustering analysis delivered the discomfiting revelation of nearly identical customer characteristics, the unexpected information about customer behavior seemingly unnoticed by the competition infused management with the moxie to instigate an astute and perceptive competitive analysis. The marketing strategists at the brewery weighed up the pros and cons of their company and those of the competitors from public information, the apparent strategy with its product lines, and the industry scuttlebutt about their rival's business priorities and objectives.

The brewer's AI provider recommended outfitting the brewer with another application to thwart the competition. This AI process monitors retail outlets in real-time, in which store operators with accurate, immediate information can adjust pricing, displays, and promotions to conform to customer preferences. For instance, a Circle K convenience store in Texas in one part of a city where construction workers converge at 5:00 pm after a day shift may transfer beverages with a pricing promotion from the refrigeration compartments in the rear of the store to convenient, easy-to-grab chilling shelves near the cashier. At the same time, the AI algorithm may notify a particular crowded HEB supermarket teeming with after-work shoppers to announce a promotion that encourages repeat sales that suppresses rivals. Through another AI algorithm that monitored retail outlets in real-time, the company could instantaneously adjust prices and initiate promotions in

anticipation of high demand in various locations such as retailers near sporting events or convenience stores located at highly trafficked intersections with voluminous influx of customers.

5.2. The Fruit Company

The firm's international farms primarily were shipping fruit around the world, either as fresh produce like bananas and pineapples or preserved in cans or plastic snack packs. Management had been experimenting with various forms of packaging and product diversification for its canned and processed fruits. Mini-packets of fruit yielded higher margins than fresh produce sold at commodity prices with intense competition. Yet, the mass marketing of national and regional supermarket chains relied upon the company as a secure supplier of high-quality fresh produce.

A section of the company's fresh fruit market share seemed to be gradually atrophying at the margin. With access to declining transportation costs and improvements in crop yields, small farms and cooperatives were chiseling away the company's time-established relative market share in the spot market. Unlike the company's contracts with multi-store supermarket chains for specific volumes of certain graded quality of fruit, the spot market with price bidding presented only vagaries. Planning in the fruit commodities market was an oxymoron. Still, with its storied corporate history, the company had solidified itself as a stalwart in the commodity fruit market. The initial inclination of management with its financial resources and economies of scale from its industrial-sized farms was to rout the competition to restore its historical, relative market share.

Management misinterpreted the erosion of what the fruit division termed the secondary buyers. The contraction of market share, according to the prevailing corporate ethos, represented not an absolute loss among the secondary buyers but instead a corresponding increase in market gains among national and local grocery wholesalers and buyers in expansive supermarket chains. Managers attributed the gains in primary market share to the firm's bargaining power in its ability to guarantee quality produce and security of supply instead of to organic growth of the U.S. economy.

The findings of the clustering analysis countered the management's untested presuppositions. The algorithm highlighted a distinct schism between the characteristics of the company's secondary buyers and a notable shift among competitors' marketing approaches. Firstly, contrary to corporate speculation, the number of independent fruit growers and their seasonal yields had boosted production by as much as twenty percent for some types of fruits and vegetables. The company had been paring down prices and consequently profits in vain efforts to preserve market share. Secondly, wholesalers and distributors were redounding to the spot market instead of with consistent, brand-name suppliers with both formal contracts and informal agreements.

Evaluation of competitive behavior dissuaded management from vigorously forfending the contested market share. Management recognized immediately the

excessive fragmentation among the multitude of independent, micro-sized farms selling into the spot market. One executive described an exercise to reclaim market share from the relatively feisty, independent producers would be like chasing raindrops. For every displaced producer, another would crop up. Secondly, hawking fruit on the spot market would fetch only commodity prices without the economic rent from differentiated products such as specialty individual fruit packets. Thirdly, with the robustness of the spot market, secondary buyers would persist with fostering competition in the spot market among the passel of producers to suppress prices and engender certainty of supply.

Based on the clustering analysis, the company favored directing resources to activities with relatively high-margin specialty products and steadfast clients such as the national supermarket chains to exact above-average industry margins through its bargaining power. With the forecasted advertising and promotion costs of recouping the conceded market share, management had recognized the likelihood of investing in retaliatory tactics without significantly regaining market share or curtailing the output of independent, atomistic farms. Even with an effective marketing campaign, the competing pricing in a commodity market would generate less profit than expansion into high-margin products.

In passively relinquishing market share in the secondary market, executives could foresee an advantage. With a thriving spot market, excess or second-quality produce could be traded on the spot market to garner marginal revenues, instead of being discarded or left to rot in the field. In times of low crop yields or unforeseen spikes in demand, the company could produce on the spot market as ingredients for canned or other packed fruit or to ship to grocers. In the event of price swings, the company could utilize the spot market when prices plummeted, while reserving its inventory when prices inflate with constrained supply.

5.3. The Men's Toiletry Manufacturer

The company caters to a variety of men's vanities and needs with multiple products. Market share for one cologne and after-shave brand had been slowly evaporating. The product, long-established as a staple for its masculine scent, had sustained a relatively constant market share through brand loyalty and its reputation among men. Despite an onslaught of challengers over several years, the stalwart product forfended its market share with some minimal wavering.

Its historical sales began to slip as competitors were gnawing into the same market. The factions of the marketing group were jousting over the cause and the most effective, countervailing tactics to deploy. Marketing intelligence confounded the marketing quagmire further. Data from pharmacies and supermarkets is split into two types of customers. Men 33 years and older, or their wives or partners, were purchasing the product at the same volume. For this group, market share upheld its position. For men younger than 33, the market share was sliding downward.

The clustering analysis, similar to the example in **Figure 3**, while demonstrating the similarities of clients between the company and the other contenders for mar-

ket share, uncovered a subtle difference that the marketing group could exploit in developing a forgetive product. The findings revealed that product packaging and compact container size for traveling appealed to customers. What was surprising to the group was that the customers deemed the product's scent favorable, though relatively weak compared to those of rivals. On the advice of the marketing group, senior management authorized the creation of a "new" product.

The innovation hardly altered the ingredients of the product, though the fragrance was intensified. The thought behind the decision to sharpen the scent instead of totally reformulating the product sought to perpetuate the youthful customers as they matured when they would prefer a subtle aroma. The primary modification of the product resulted in a modernized, tantalizing design and packaging. The packaging refashioned the shape of the container with a shape with a masculine, viral aura. The graphics on the receptacle were conceived to appeal to the cool frippery of the sporty "20 and 30 somethings" rather than to staid, family-oriented professionals. Observed for the first year of its introduction, the product was retaking its forfeited market share.

The clustering analysis helped the company to reconfigure the market. The re-fashioned product with a spicy, spiked-up scent and jazzy packaging attracted customers away from competitors without weaning users away from the conventional brand. Market research revealed a couple of salubrious factors. The first verified that many of the customers who defected to other products rebounded back to the reinvigorated, restyled product. Secondly, the stalwart, youthful customers, about whom management worried, might renege on their loyalty, continued to buy the traditional brand. Thirdly, to management's amazement, sales of the wonted, mature-oriented group bumped up by 10 to 15 percent. The research data ferreted out that the mature man, or perhaps his significant other, perceived the flush of excitement from the rejuvenated product for young male adults spilled over to the relatively staid mature male consumer.

6. Conclusion

Clustering analysis, as evinced in the three firms, exemplifies the potential diversity for AI applications. Adapting the clustering from simply marketing to gain insights into customer categories and related purchasing characteristics is a crucial component for formulating defensive strategies, and portending other uses of AI in shaping corporate strategies. The experience of the three firms attests to a relatively novel tactic for forging strategy through AI algorithms.

Acknowledgements

We wish to thank Dmitriy Ivkov and Ethan Wu for their help in researching the article and their assistance in editorial and computational tasks.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Csaszar, F. A., Ketkar, H., & Kim, H. (2024). Artificial Intelligence and Strategic Decision-Making: Evidence from Entrepreneurs and Investors. *Strategy Science*, 9, 322-345. <https://doi.org/10.1287/stsc.2024.0190>
- Du, K. L. (2010). Clustering: A Neural Network Approach. *Neural Networks*, 23, 89-107. <https://doi.org/10.1016/j.neunet.2009.08.007>
- Hauser, J. R., & Shugan, S. M. (1983). Defensive Marketing Strategies. *Marketing Science*, 2, 319-360. <https://doi.org/10.1287/mksc.2.4.319>
- Heil, O. P., & Helsen, K. (2001). Toward an Understanding of Price Wars: Their Nature and How They Erupt. *International Journal of Research in Marketing*, 18, 83-98. [https://doi.org/10.1016/s0167-8116\(01\)00033-7](https://doi.org/10.1016/s0167-8116(01)00033-7)
- Mirwan, S. H., Ginny, P. L., Darwin, D., Ghazali, R., & Lenas, M. N. J. (2023). Using Artificial Intelligence (AI) in Developing Marketing Strategies. *International Journal of Applied Research and Sustainable Sciences*, 1, 225-238. <https://doi.org/10.59890/ijarss.v1i3.896>
- Sanderson, S., & Uzumeri, M. (1995). Managing Product Families: The Case of the Sony Walkman. *Research Policy*, 24, 761-782. [https://doi.org/10.1016/0048-7333\(94\)00797-b](https://doi.org/10.1016/0048-7333(94)00797-b)
- Singla, A., Sukharevsky, A., Yee, L., Chui, M., & Hall, B. (2025). *The State of AI: How Organizations Are Rewiring to Capture Value*. McKinsey & Company. <https://www.mckinsey.com/capabilities/quantumblack/our-insights/the-state-of-ai>