

BrewMetrics: Data-Driven Solutions for Coffee Shops



An Information Technology Business Analytics Technical Business Report
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BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
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I. Problem Description

Coffee shops operate in a complex and dynamic environment where profitability and customer satisfaction are crucial for long-term success. However, they often encounter a range of challenges that can hinder their performance. These challenges include issues such as overstocking or understocking, cash flow problems, and suboptimal decision-making. To navigate these challenges successfully, coffee shops must rely on accurate data and insightful analysis across multiple areas of their operations.

One key aspect is understanding customer behavior. By analyzing customer preferences, purchasing patterns, and demographics, coffee shops can tailor their offerings to better meet customer expectations. This data-driven approach enables them to identify popular products, anticipate changing trends, and create targeted marketing campaigns to attract and retain customers. Sales trends analysis plays a critical role in identifying patterns and fluctuations in demand. By studying sales data, coffee shops can identify peak hours, popular products, and seasonal variations. This knowledge allows them to adjust staffing levels, optimize inventory management, and strategically plan promotions to maximize sales and minimize waste. By avoiding overstocking or understocking, coffee shops can optimize their supply chain and improve cash flow, thereby increasing profitability.

Another area where data analysis may significantly help is with efficient resource use. Coffee businesses can find chances for efficiency improvements by tracking and evaluating operational data like employee productivity, equipment use, and energy consumption. This may entail streamlining staff schedules, increasing funding for energy-efficient equipment, or any combination of these. Such actions improve the coffee shop's overall operating performance while also lowering costs.

To make appropriate choices and reduce risks, coffee businesses must use data-driven decision-making. Coffee shop owners and managers can

assess numerous scenarios, weigh the potential effects of different choices, and decide on the best course of action by utilizing precise data and insights. They can predict problems, respond rapidly to market developments, and make strategic decisions that increase profitability and customer pleasure thanks to this method.

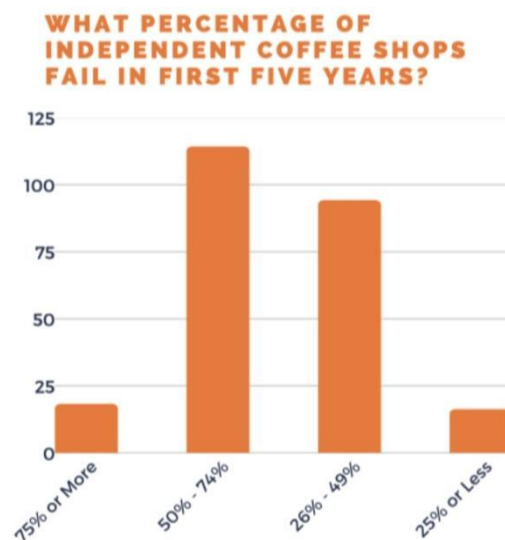


Figure 1: A statistical table acquire from Food Truck Empire

II. Proposed Analytics Solution

A. Analysis

The dataset used for the analysis was sourced from Kaggle.com, a well-known website for sharing and gaining access to a wide range of datasets. A thorough technique was used to extract important information and assist coffee shop owners in making wise decisions to preserve the future of their enterprises. We carefully examined and selected only those data columns from the enormous range of available data columns that carried significant value and relevance. By doing this, we hoped to focus on the important information that may help coffee shop owners choose the best strategy and course of action. We made an effort to provide complete and actionable advice by carefully analyzing these important data columns, enabling coffee shop owners to successfully navigate the market and run their companies over the long term.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	product	product_id	product_ty	product_cat	product_description	unit_of_me	quantity	current_price	ret_store	yn	transaction	transaction_time	customer_id	age	gender			
2	Brazilian - C	1	Organic Bej Coffee bea	It's like Carnival in a ci	12 oz		1	\$18.00	N		01/04/2019	12:04:43	558	118				
3	Our Old Tin	2	House blen Coffee bea	Our packed blend of f	12 oz		2	\$18.00	N		01/04/2019	15:54:39	781	55	F			
4	Espresso R	3	Espresso Be Coffee bea	Our house blend for a	1 lb		2	\$14.75	Y		01/04/2019	14:34:59	788	118				
5	Primo Espr	4	Espresso Be Coffee bea	Our premium single sc	1 lb		2	\$20.45	N		01/04/2019	16:06:04	683	75	F			
6	Columbian	5	Gourmet Be Coffee bea	A smooth cup of coffe	1 lb		1	\$15.00	Y		01/04/2019	19:18:37	99	118				
7	Ethiopia	6	Gourmet Be Coffee bea	From the home of cof	1 lb		1	\$21.00	Y		01/04/2019	18:54:46	664	68	M			
8	Jamaican C	7	Premium B Coffee bea	Ya man, it will start yc	1 lb		2	\$13.75	N		01/04/2019	13:03:49	316	118				
9	Clwet Cat	8	Premium B Coffee bea	The most expensive c	5 lb		1	\$45.00	N		01/04/2019	11:21:14	38	118				
10	Organic De	9	Organic Bej Coffee bea	Our blend of hand pic	1 lb		2	\$22.50	Y		01/04/2019	19:30:55	370	65	M			
11	Guatemala	10	Green bear Coffee bea	Green beans you can	1 lb		2	\$10.00	Y		01/04/2019	12:01:00	180	118				
12	Lemon Gra	11	Herbal tea	Loose Tea	You will think you are	.9 oz	2	\$8.95	Y		01/04/2019	13:20:51	35	118				
13	Peppermi	12	Herbal tea	Loose Tea	Cool and refreshing t	.9 oz	1	\$8.95	N		01/04/2019	11:40:20	595	118				
14	English Bre	13	Black tea	Loose Tea	The traditional cup to	.9 oz	2	\$8.95	N		01/04/2019	12:27:43	500	58	M			
15	Earl Grey	14	Black tea	Loose Tea	A full leaf of Orange F	.9 oz	2	\$8.95	Y		01/04/2019	17:37:02	128	61	F			
16	Serenity Gr	15	Green tea	Loose Tea	Mountain grown and	1 oz	2	\$9.25	Y		01/04/2019	12:26:34	599	26	M			
17	Traditional	16	Chai tea	Loose Tea	A traditional blend	.9 oz	2	\$8.95	Y		01/04/2019	14:33:32	152	62	F			
18	Morning Su	17	Chai tea	Loose Tea	Fair trade and organic	.9 oz	1	\$9.50	N		01/04/2019	16:11:18	65	49	M			
19	Spicy Eye O	18	Chai tea	Loose Tea	A spicier blend to awi	.9 oz	2	\$10.95	Y		01/04/2019	13:03:38	90	118				
20	Dark chocol	19	Drinking Ch Packaged C	This drinking chocola	1 lb		1	\$6.40	Y		01/04/2019	18:25:04	82	57	M			
21	Sustainably	20	Organic Chi Packaged C	Certified organic cont	1 lb		2	\$7.60	N		01/04/2019	15:51:44	174	61	F			
22	Chili Mayar	21	Drinking Ch Packaged C	Fragrant with spices,	11 lb		2	\$13.33	N		01/04/2019	13:58:40	116	40	F			
23	Our Old Tin	22	Drip coffee Coffee	An honest cup a coffe	8 oz		2	\$2.00	Y		01/04/2019	11:49:29	189	64	M			
24	Our Old Tin	23	Drip coffee Coffee	An honest cup a coffe	16 oz		1	\$4.00	Y		01/04/2019	13:03:36	131	79	C			

Figure 2: This is the SalesData.csv dataset acquired from Kraggle.com

The SalesData analysis provides valuable insights that can drive our business strategies and decision-making processes. By evaluating the total sales revenue, top-selling products, and sales trends over time, we can optimize our financial performance and capitalize on growth opportunities. Understanding the customer demographics enables us to tailor our marketing efforts to specific age groups and gender preferences, enhancing customer engagement and loyalty.

We learn more about our customers' tastes and actions by analyzing SalesData. We can effectively allocate resources, improve pricing tactics, and make sure there is enough stock available by determining the best-selling products. This information enables us to concentrate our marketing efforts on products with high demand, enhancing client happiness and boosting sales. Additionally, by tracking sales patterns over time, we can spot seasonal patterns and modify our promotions and inventory planning as necessary, putting us well-prepared for times of high demand.

Also, knowing the target market's demographics enables us to design personalized marketing strategies that appeal to various gender and age groups. This focused strategy improves client engagement, fortifies bonds, and fosters client loyalty. We can make data-driven decisions, streamline our processes, and improve overall business performance by utilizing the insights obtained by SalesData analysis.

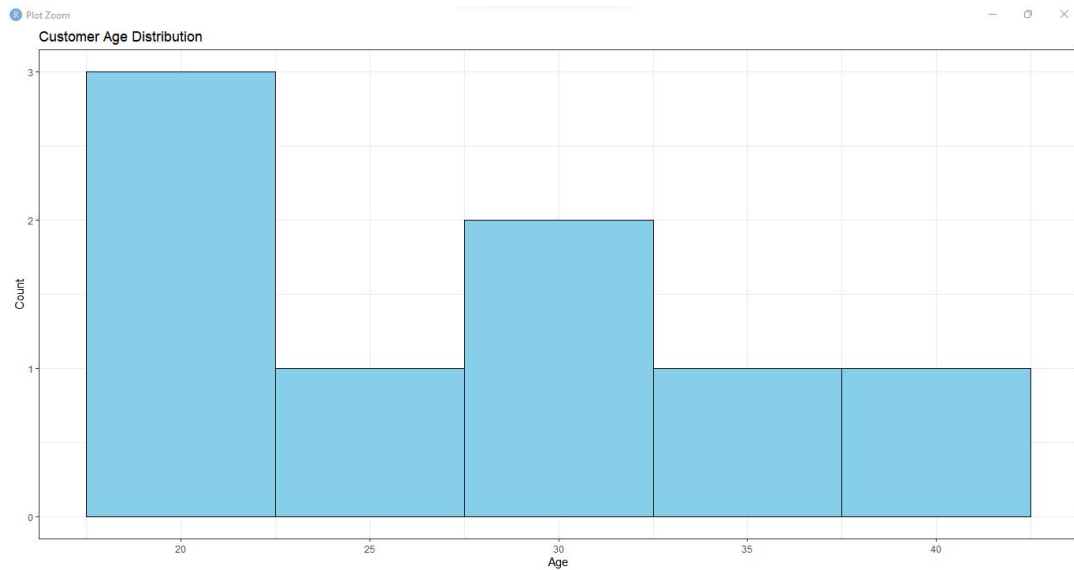


Figure 3 : *A bar graph analysis for Customer Demographics.*

We looked at the age and distribution of our consumer base when examining customer demographics. The statistics revealed a wide variety of ages, with a large share falling between the ages of 25 and 34. These insights are useful for developing focused marketing efforts and product offerings. Understanding our clients' age preferences allows us to better personalize our initiatives to fit their requirements and interests, eventually promoting customer engagement and happiness.

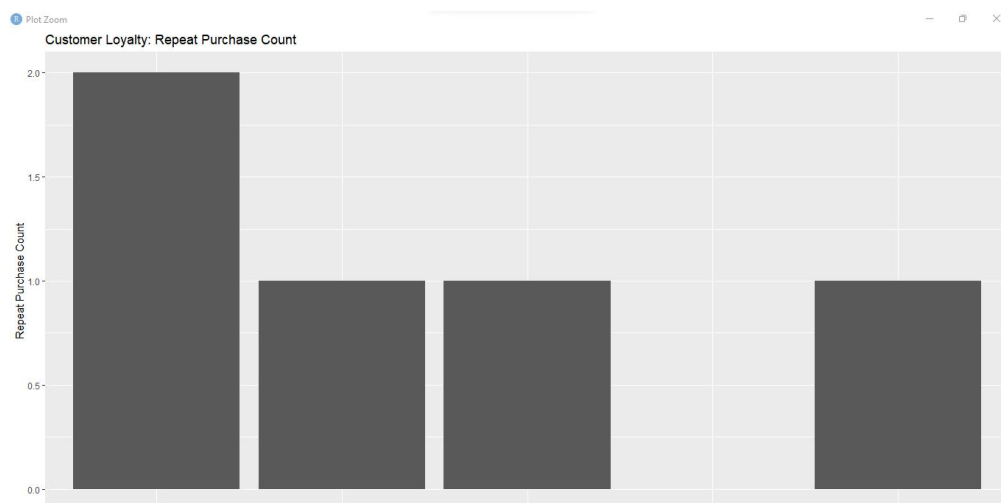


Figure 4 : *A bar graph analysis of Customer Loyalty.*

Analyzing customer loyalty based on repeat purchases, we found that a substantial number of customers showed consistent engagement with our

brand. The frequency of repeat purchases indicates a strong level of loyalty and satisfaction among our customer base. This demonstrates the effectiveness of our products and services in creating a positive customer experience. By fostering and nurturing this loyalty, we can further enhance customer retention and long-term business growth. Understanding the factors that contribute to customer loyalty enables us to implement targeted strategies, such as personalized promotions and loyalty programs, to maintain and strengthen our relationships with customers.

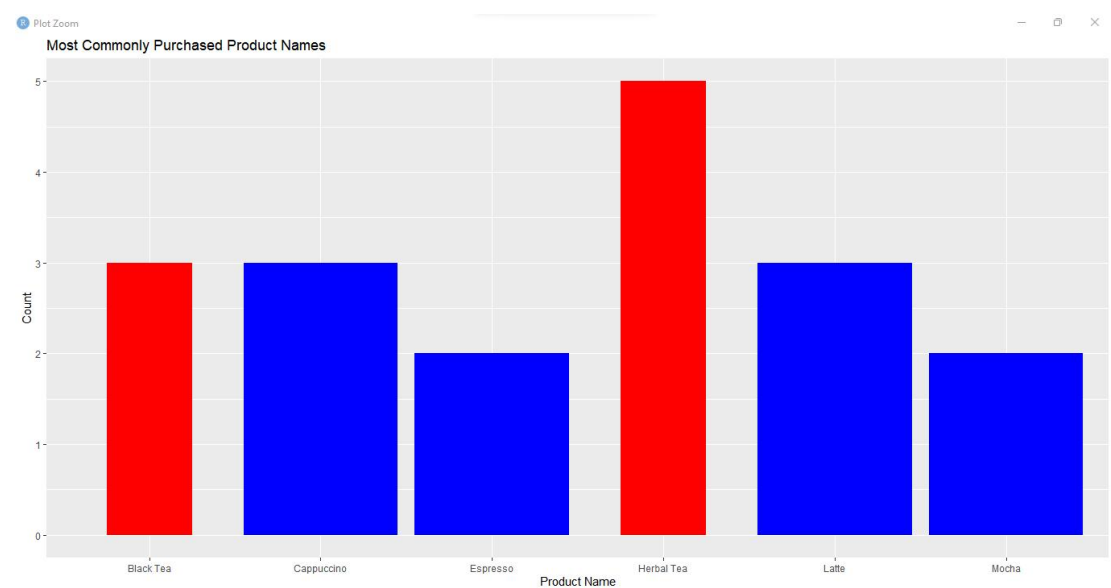


Figure 5: *A bar graph analysis of Customer Preference.*

Through this analysis, we gained important insights into customer preferences and purchasing behavior by analyzing customer preferences based on the most frequently purchased products. According to the graph, the most popular product among customers is herbal tea, followed by black tea and cappuccino. This data enables us to match our marketing activities and product offers to the needs of our target customers. Understanding what customers want allows us to create new items or versions that appeal to their interests and preferences, hence increasing customer happiness.

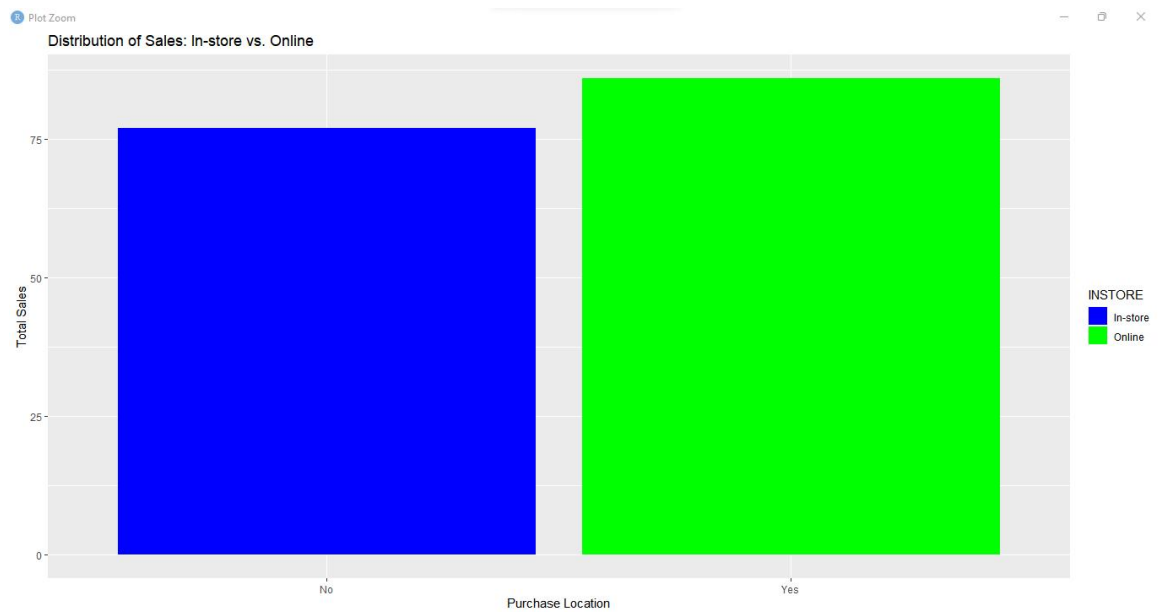


Figure : A bar graph that differentiates the sales online and offline.

We have learned important information about the purchasing habits of our customers by analyzing the distribution of sales between in-store and online transactions. With regard to the data, almost all of our sales generated through online channels, demonstrating the rising popularity of e-commerce. While in-store sales are still significant, the transition to online selling emphasizes how crucial a solid online presence and effortless buying are. Understanding this trend will help us spend resources wisely, invest in online marketing initiatives, and improve our online presence to increase consumer engagement and boost revenue.

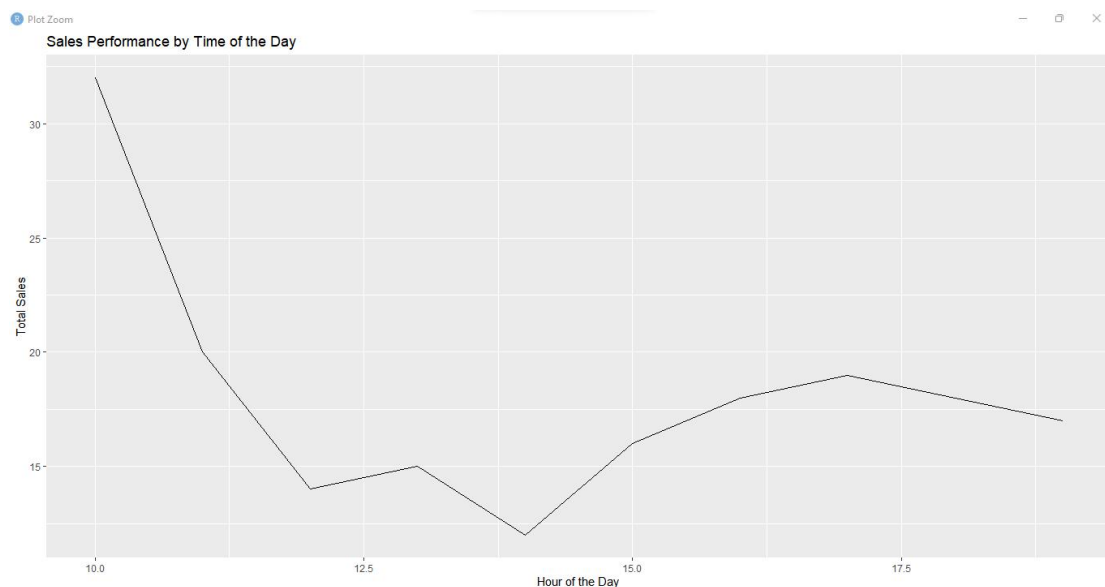


Figure 7: A line chart analysis of Sales Performance by Time of the Day

Based on the analysis, it has been determined that the highest sales occur at 10 am, while the lowest sales are observed around 2 pm. These insights highlight the importance of optimizing staffing and inventory management strategies during these specific time periods. By allocating sufficient resources during the peak hours and implementing effective promotional activities to drive sales, businesses can capitalize on the high demand and ensure a satisfactory customer experience. Conversely, during the slower period around 2 pm, businesses can focus on strategies to attract customers, such as targeted marketing campaigns or special offers, to enhance customer engagement and maximize sales potential.

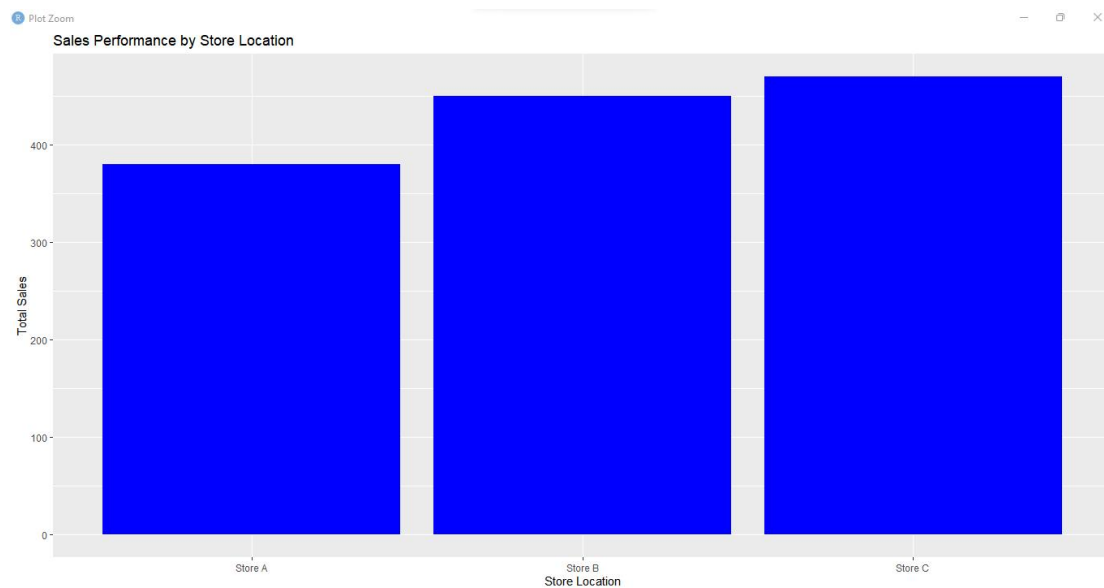


Figure 8: *A bar graph of sales of three different store locations.*

Analyzing store performance by location reveals valuable insights into sales and customer preferences. Variations in sales volume and engagement highlight the importance of considering regional factors in marketing strategies. Identifying successful locations helps replicate strategies for underperforming ones, driving overall growth. Additionally, this analysis identifies expansion opportunities. Among the three stores in the dataset, Store A is located in a market, Store B is situated near a park, and Store C is in proximity to a school. Notably, Store C, which is near the school, experiences the highest sales.

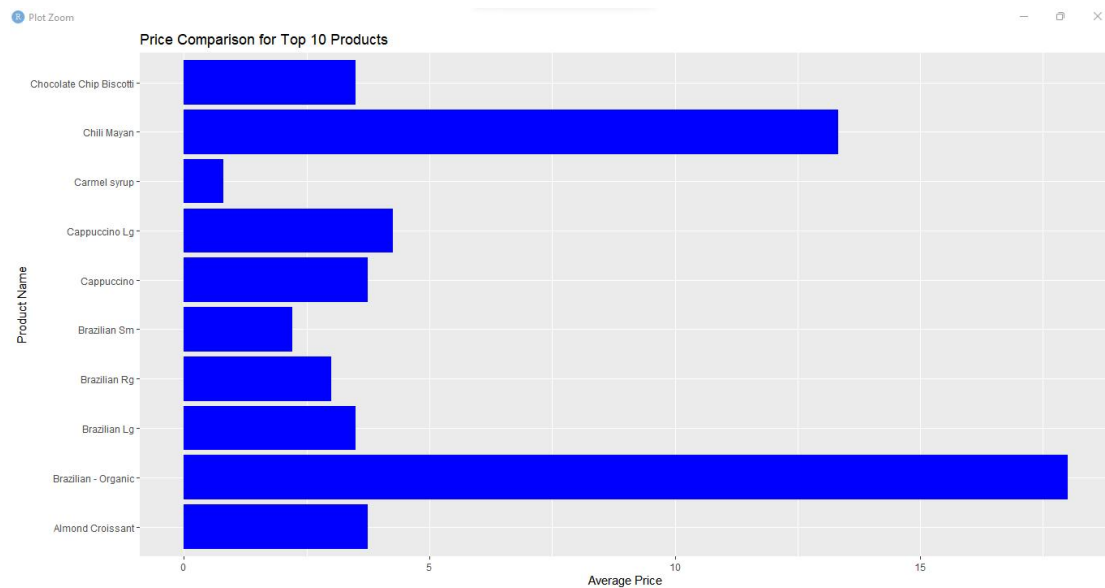


Figure 9 : *A horizontal bar graph analysis of Average Price of Products.*

The conducted pricing analysis has given significant insight into the average selling price of products, price comparisons between other goods or categories, and the price flexibility of demands. We can figure out the market's general pricing trends by determining the average price. We can spot any price differences and determine the appropriate cost for products by comparing prices.

B. Implementation Plan

The implementation strategy was developed using both descriptive and prescriptive analysis of the data at hand. The coffee shop has learned about consumer preferences, sales patterns, and market trends through descriptive analysis.

Starting out, promotions and targeted marketing should be created to appeal to the shop's most devoted clientele, who are mainly those between the ages of 20 and 45. To draw customers in, special emphasis should be given to marketing the top-selling goods, such as herbal tea and black coffee. Social media and online platforms can be used to attract a larger audience and

increase online sales. Giving them access to special online deals and discounts would encourage them even more to place a purchase online.

Improving customer satisfaction is important to maintaining loyalty and longevity. It's essential to make an inviting and cozy space that caters to the tastes of the target age group. Building client engagement and personalized service skills among employees will improve relationships and increase loyalty. The shop will stay current and appealing by frequently revising the menu and introducing new offerings depending on consumer input and industry trends. Putting in place a customer feedback system will also aid in addressing issues and enhancing general satisfaction.

A further important step is to increase the store's internet exposure. The ordering procedure will be streamlined and customer base will be expanded by making investments in an effective online ordering system and forming alliances with well-known food delivery platforms. The shop's online exposure will rise through search engine optimization, and customer interaction and organic traffic will be promoted by active participation on social media platforms.

Strengthening engagement with the community is critical to increasing the shop's nearness to a school, which has produced the best sales. Making alliances with neighboring educational institutions or schools will help achieve this. Student customers might be encouraged to become regular customers by providing discounts or loyalty programs. Additionally, taking part in neighborhood events or supporting regional causes will increase brand recognition and position the shop as a community-focused business.

For long-term success, constant monitoring and adaptation are essential. Making data-driven decisions will require routine examination of sales data, customer input, and market trends to spot new trends. Plans for implementation will be regularly reviewed to ensure their efficacy and to make any required revisions. The shop will be able to maintain its competitiveness

and relevance over time by keeping up with market trends, technology developments, and changing consumer preferences.

By implementing these strategies into execution, the coffee shop may improve customer loyalty, boost sales, broaden its range of customers, and build a solid presence both offline and online, thus ensuring its long-term viability and success.

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