Project: Analyzing a Market Test

Business Problem

Management for an upscale coffee chain wish to test a menu change with an advertising campaign in two cities. To justify the increased marketing budget required, the test stores will have to demonstrate a 18% incremental lift in comparison to the control stores. The performance metric utilized to evaluate the results of this test will be gross margin and specifically incremental lift. The test period ran for a period of 12 weeks from 2016-April-29 to 2016-July-21 and the data will be aggregated at week level. All data analysis was conducted in Alteryx Designer 2018.3.5 (Colorado, USA).

Data Preparation

Both gross margin and customer traffic (distinct invoices) were aggregated to a week level. To avoid skewing the analysis, only stores with 76 weeks of data were retained in the analysis to calculate trend and seasonality.

Match Treatment and Control Units

To identify control features, trend and seasonality variables were calculated utilising the weekly store customer traffic and the 'AB trend tool'. Additionally, a correlation analysis was utilised to identify other potential control variables. Of the two viable features ('store square ft.' and 'average monthly sales') only average monthly sales was identified as being strongly and significantly related to gross margin (fig 1).

	Weekly.Gross.Margin	Sq_Ft	AvgMonthSales
Weekly.Gross.Margin	1.000000	-0.019345	0.790358
Sq_Ft	-0.019345	1.000000	-0.046967
AvgMonthSales	0.790358	-0.046967	1.000000

Figure (1). Correlation Matrix.

Using the trend, seasonality, and average monthly sales features, the 'AB controls' tool was utilised for both the Central and West regions to identify two control units per treatment unit (Table 1).

Table 1. Matched Treatment and Control Stores

Treatment Store	Control Store 1	Control Store 2
2288	2568	9081
2293	9524	12219
2301	9238	3102
2322	3235	2409
2341	2383	12536
1664	8112	7162
1675	1807	1580
1696	1863	1964
1700	1630	2014
1712	7434	8162

Analysis and Writeup

This analysis assessed the commercial viability of launching a new menu. The analysis overall demonstrated a significant lift of 39.6% in weekly gross sales across the ten stores ($p<0.001$) (fig 2). This exceeds the required threshold set by management to risk the additional investment required to launch the new menu across all stores. As such, the new menu should be introduced nationwide.

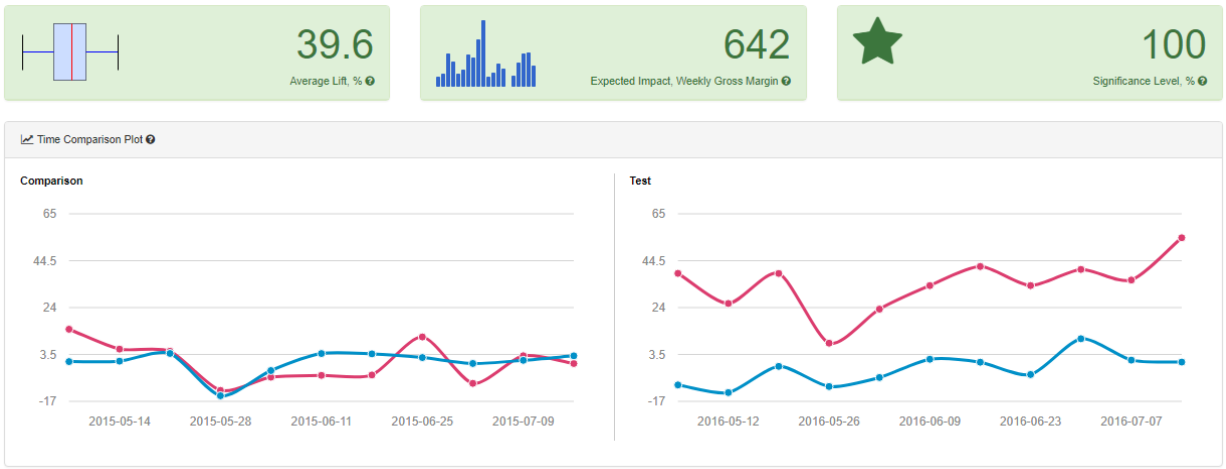

Figure (2) Summary of findings for both regions

When examining the results by region, similar results were identified. In the West region the new menu resulted in a significant lift of 38.1% in weekly gross margin [$509.1] (p=0.007). When compared to the same weeks in the preceding year, the control group remained largely unchanged while the treatment group demonstrated a substantial increase in gross margin (fig 3).

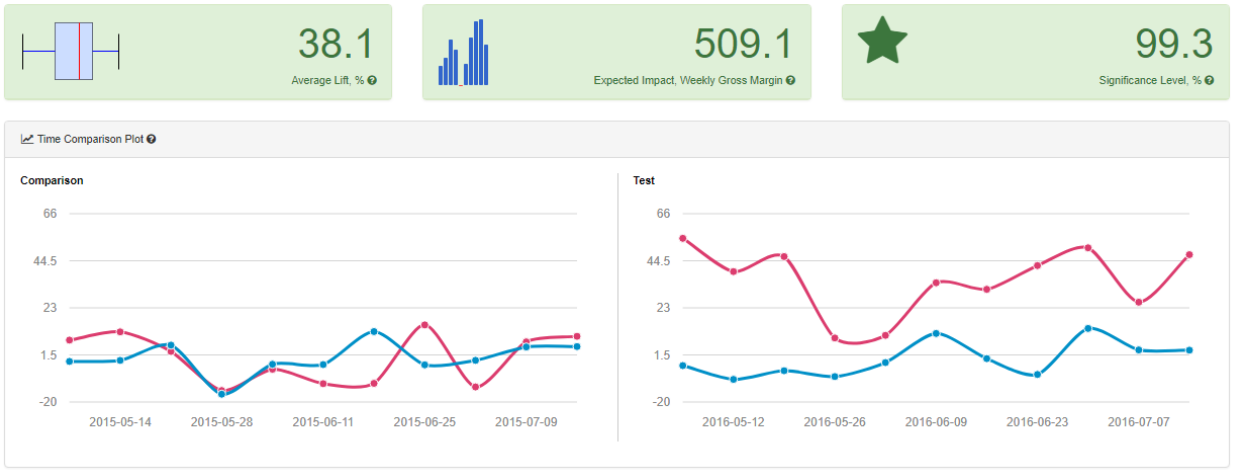

Figure (3) Summary of findings for the West region

In the central region, the new menu also resulted in a significant lift of 41.1% in weekly gross margin (p=0.008). Similar to the West region, the treatment stores in the Central region

demonstrated a substantial increase in gross margin for each week in comparison to the same period in the preceding year. In contrast, the control stores generally remained unchanged (fig 4). This would equate to an expected increase of $774.8 per store per week.

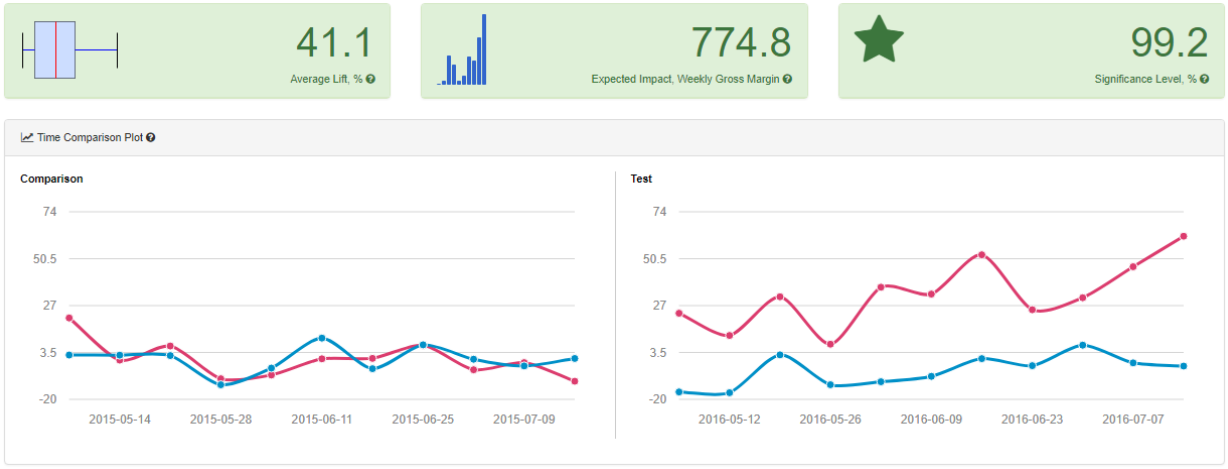

Figure (4) Summary of findings for the West region

Given these positive findings, the introduction of this menu across all stores can be recommended. Full Alteryx workflow is presented below (Fig 5).

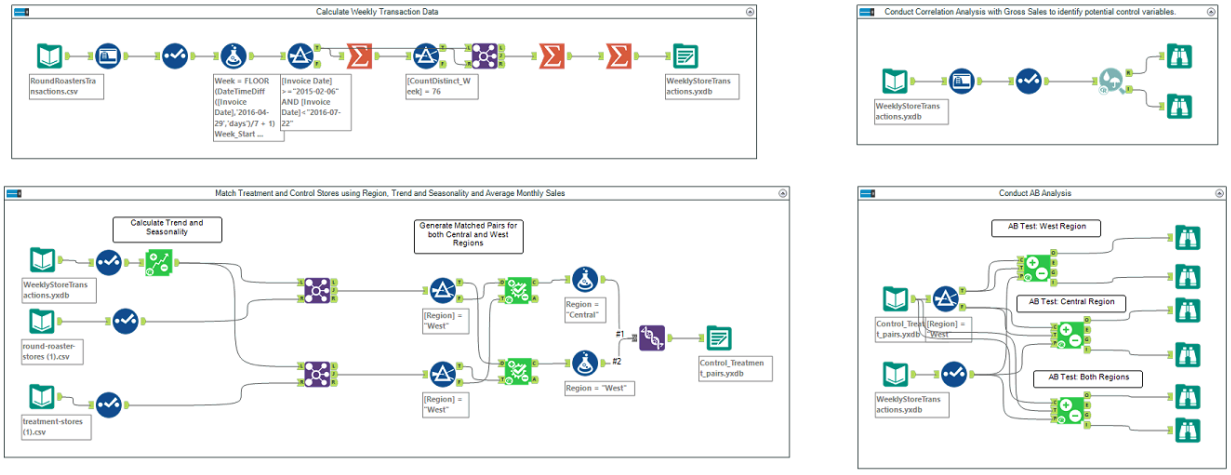

Figure 5. Alteryx Workflow.