

# International Journal of Innovative Research in Science, Engineering and Technology

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## Analysis of Factors Affecting the Sales of Stores

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**ABSTRACT:** This paper analyses the factors important for CPI and employee working rate of a store that affected by growth of sales. In this paper we are using MDDB for analysing different dimensions of store that are going to affect store sales through directly or indirectly to the CPI and Employee working rate. In this research we are going to suggest one process that helps to improve the sales and profit margin with the changes made to CPI and Employee working rate. We have used MCDM (Multi criteria decision making) for making decision related to the growth of sales with respect to different stores.

**KEYWORDS:** CPI (consumer price index), Employee working rate (EWR), MCDM (multi-criteria decision making), MDDB (multi-dimensional database), Sales growth.

### I. INTRODUCTION

This research is a qualitative research method which implies by using multi-criteria decision making where we get to know how CPI and Employee working rate affects the sales of stores. Sales growth helps to know that we have to increase or decrease, CPI or EWR according to the requirements of the consumer. To increase Sales and profit margin employee working rate can be affected as per requirements of the stores. Deficit of CPI and Employee working rate calculation and prediction can be done using historical data to increase sales of stores. Employee working rate also gets affected by the size of the stores and location of stores. In this research we have used 45 stores data with a history of 4 years and the changes calculated on a weekly basis. By using this data we calculate growth of sales and the differences are made to CPI and employee working rate according to the growth of sales. How the size of stores matter for the growth of sales, based on that and the data for weekly sales the differences in CPI and employee working rate are measured and noted to derive a pattern. By using data warehouse and business intelligence we are going to suggest a pattern to the stores that will describe the deficit in sales based on the changes in CPI and the EWR and since we know that increase in sales is directly proportional to demand it can be easily understood by looking at the BI output which helps us to identify the increase or decrease in demand as well as the sales in the 4 years. And using this pattern we are going to suggest CPI and Employee working rate to be increased accordingly for sales growth to increase the profit margin of Store.

### II. IMPLEMENTATION

So for this research what we have done is basically is taken stores with consistent sales and checked their data on what factors influence the Sales of that store. We have taken the average sales of each store on a weekly basis and based on the employee working rate and the consumer price index varied the changes in sales.

Based on the average of each factor we see that the change in consumer price index (Approx.  $\pm 5$ ) or change in employee working rate (Approx.  $\pm 1$ ) is more than that then changes the outcome in sales. Overall the change in consumer price index is inversely proportional to the sales of that particular store whereas the change in employee working rate is directly proportional to sales of that store.

We took an average of the CPI, EWR and the sales from 2010-2013 and we observed that the top 10 stores have the relationship with sales as mentioned above.

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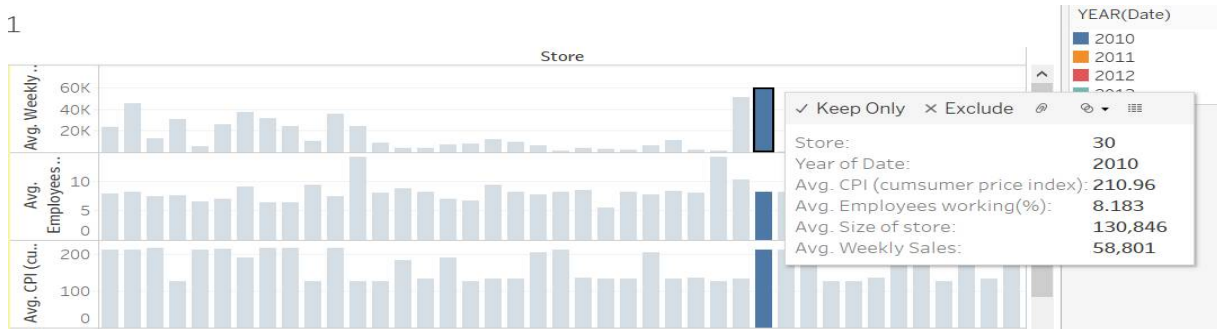


Fig.1. 2010 Analysis of CPI and EWR

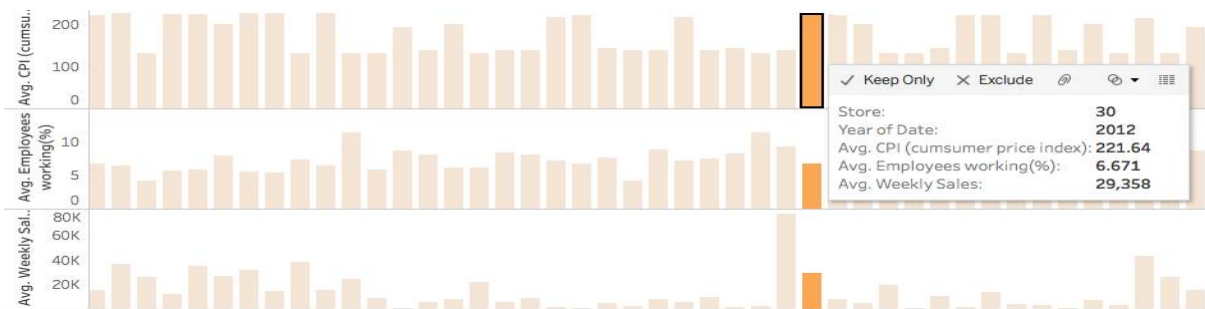


Fig.2. 2012 Analysis of CPI and EWR

The above given figures depict our observations. In Fig-1 the EWR (Employee Working Rate) is above 8 and CPI is 210.96, now by increasing CPI to 221 and decreasing EWR to below 7 the stores sales decreases to half as we can observe in the above figures. This observation was visible throughout all of the stores with similar patterns accurate to approximately  $\pm 5$  and  $\pm 1$ . Hence we came up with the pattern that these factors CPI & EWR affect the sales of each store directly.

Based on the above analysis we came up with this multi-criteria decision making which we have applied to this research paper. We came up with the following pattern for building a model for the stores :

Sale	↑	CPI	Increase (Approx. 1% - 5%)
Sale	↓	CPI	Decrease (Approx. 1% - 5%)
Sale	Constant	CPI	Minor Increase (Approx. 0.01% - 0.10%)

Table No. 1. CPI Recommendation

Sale	↑	EWR	Increase (Approx. 1% - 5%)
Sale	↓	EWR	Constant
Sale	Constant	EWR	Minor Decrease (Approx. 0.01% - 0.10%)

Table No. 1. EWR Recommendation

Legends : ↑ - increase in that dimension.  
↓ - decrease in that dimension.

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Constant – there is no change in that dimension.

So based on the research we came up with the above solution in order to modify the DIMENSIONS BASED ON THE SALE THAT OCCURS IN EACH STORES.

### III. METHODOLOGY

Research Methodology refers to the discussion regarding the specific methods chosen and used in a research paper. This discussion also encompasses the theoretical concepts that further provide information about the methods selection and application.

We collected the data from various sources but our main source for this data was kaggle.com. The size of the data that we collected was of 14\*10,00,000. For our research project we have used qualitative research method.

Qualitative research methodology or interpretative research focuses on analytically disclosing certain behaviours, and then showing how these behaviours can be clustered to lead to observable outcomes. This type of research is more subjective in nature, and requires careful interpretation of the variables.

The variables that we have identified and considered for our research are CPI (Customer Price Index) and EWR (Employee Working Rate). Based on these dimensions we have come up with the various outcomes of how these dimensions impact the sales of each store.

Since our research objective was to find out the impact of sales of each store based on various dimensions we choose qualitative research as, we wanted to find out the pattern for the dimension that has the most impact on sales of the products in each store. And we came up with the two most important factors that are directly and inversely proportional to the sales in each store.

We cleaned the dataset based on our objective to find out the factors that have the most impact on sales directly and are very crucial to each store in order to maintain their sales.

Our problem statement was to find out the factors that affect the sales and suggest methods based on it to give a suitable solution for the stores to implement. We identified those factors and found out how they affect the sales. The CPI is inversely proportional to the sales whereas the EWR is directly proportional to the sales we found this effective on 70% of the dataset and based on that we came up with a probable solution for it.

### IV. CONCLUSION

Sales of any retailing brand are one of the key facts to decide the progress and the downfall of that company. Even if the brand is widely established it might be incurring unnecessary losses which can be avoided if the pattern for that problem is picked up properly and stated with suitable solutions. From the research that we did on this particular dataset we came up with a conclusion that the CPI is inversely proportional to the sales in each store and EWR is directly proportional to the sales in each store. So we came up with our own solution to that problem where we can manage the CPI and the EWR accordingly in order to have more sales and more profit hence reducing the deficit. Based on our observations our suggestion to the stores would be based on the data provided in Table 1 & 2. The stores need to check their sales and based on that they can make changes in the CPI in order to get more profit or reduce the losses based on how the sales graph works. This decision making has to be done manually based on the sales of each week. Hence giving the stores the maximum utilisation of resources and getting maximum sales with minimal expenses.

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