

E-News Express

Business Case

Background

An online news portal aims to expand its business by acquiring new subscribers. Every visitor to the website takes certain actions based on their interest. The company plans to analyze these interests and wants to determine whether a new feature will be effective or not.

Companies often analyze users' responses to two variants of a product to decide which of the two variants is more effective. This experimental technique is known as a/b testing that is used to determine whether a new feature attracts users based on a chosen metric.

Objective

To extract actionable insights from the data that we have collected of the various customers to increase sales and identify areas of growth and improvement.

We will be majorly focusing on whether the new page is more effective in gathering new subscribers

Data Information

The data contains type of products, income and usage stats

Variable	Description	Type of Variable
user_id	This represents the user ID of the person visiting the website.	Integer
group	This represents whether the user belongs to the first group (control) or the second group (treatment).	Category
landing_page	This represents whether the landing page is new or old.	Float
time_spent_on_the_page	This represents the time (in minutes) spent by the user on the landing page.	Category
converted	This represents whether the user gets converted to a subscriber of the news portal or not.	Category
language_preferred	This represents the language chosen by the user to view the landing page.	Category

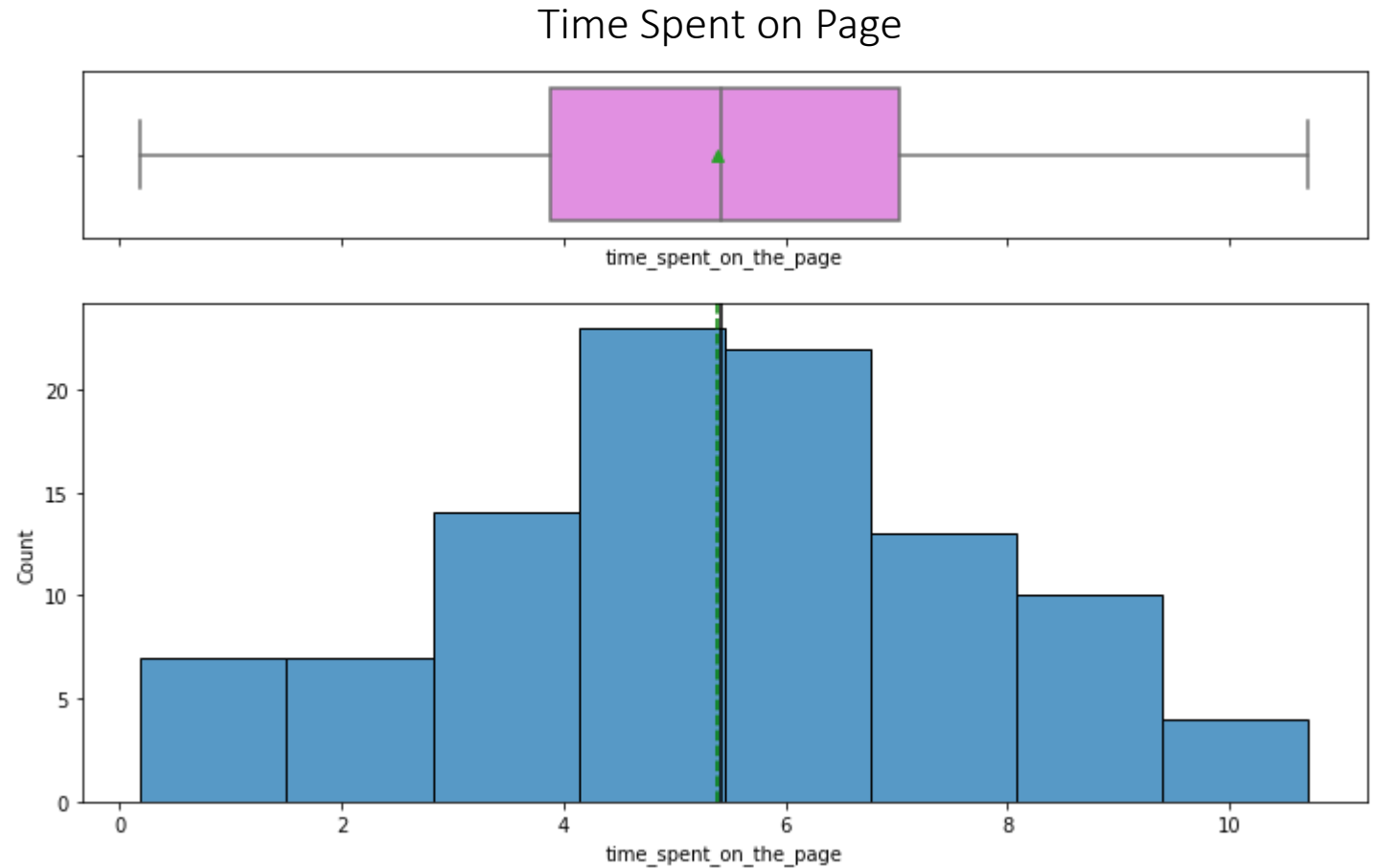
Observations	Variables
100	6

Exploratory Data Analysis – Time Spent on Page

This data contains the time spent on the page of the various customers

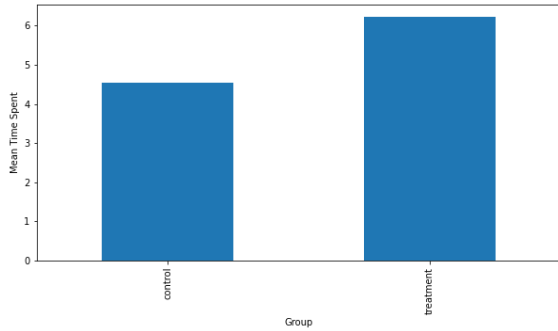
Observations:

- 1.The mean and median are very close ~5
- 2.There are no outliers in the data
- 3.The data is reasonably even



Exploratory Data Analysis – Mean Time Spent

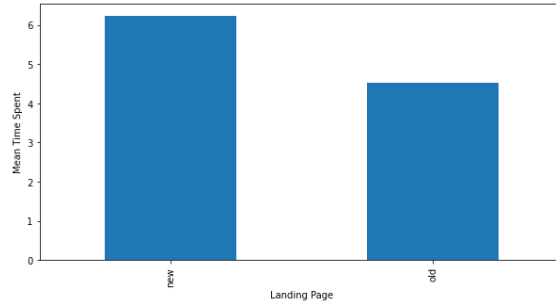
wrt to Group



Observations:

The treatment group spent a much higher mean time.

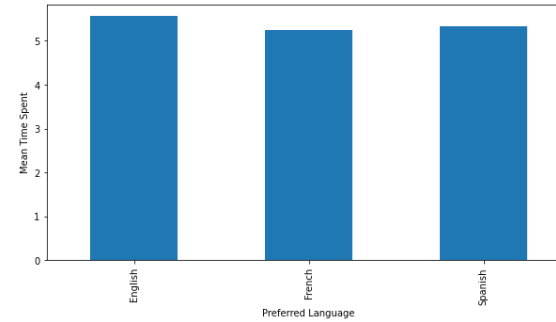
wrt to Landing Page



Observations:

The new page incurred a much higher mean time.

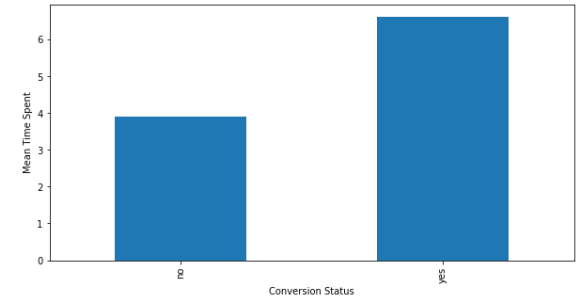
wrt to Language



Observations:

- English had the highest mean time spent
- However, the difference between mean times isn't very large

wrt to Conversion Status

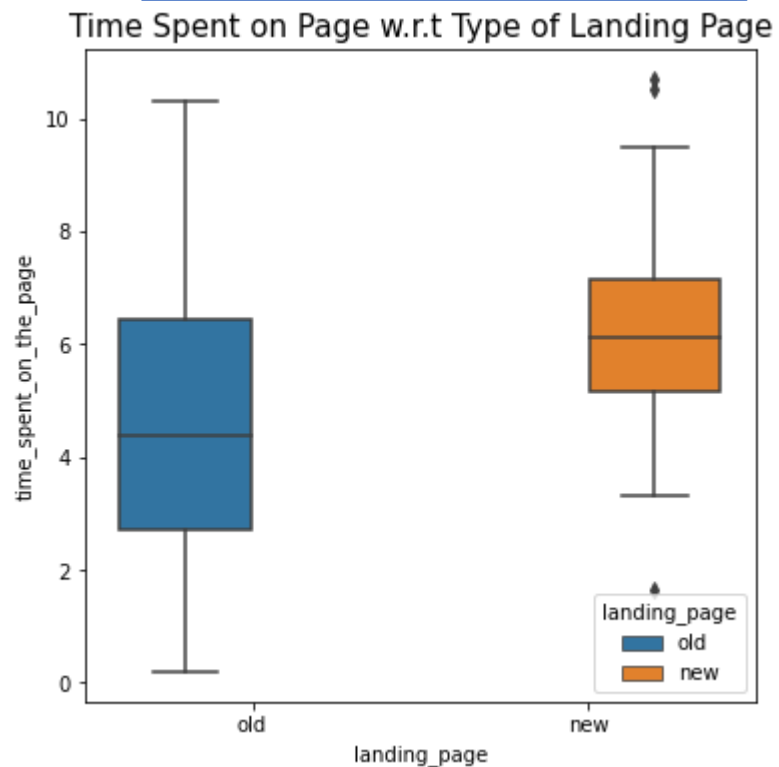


Observations:

The customers that converted spent a much higher mean time

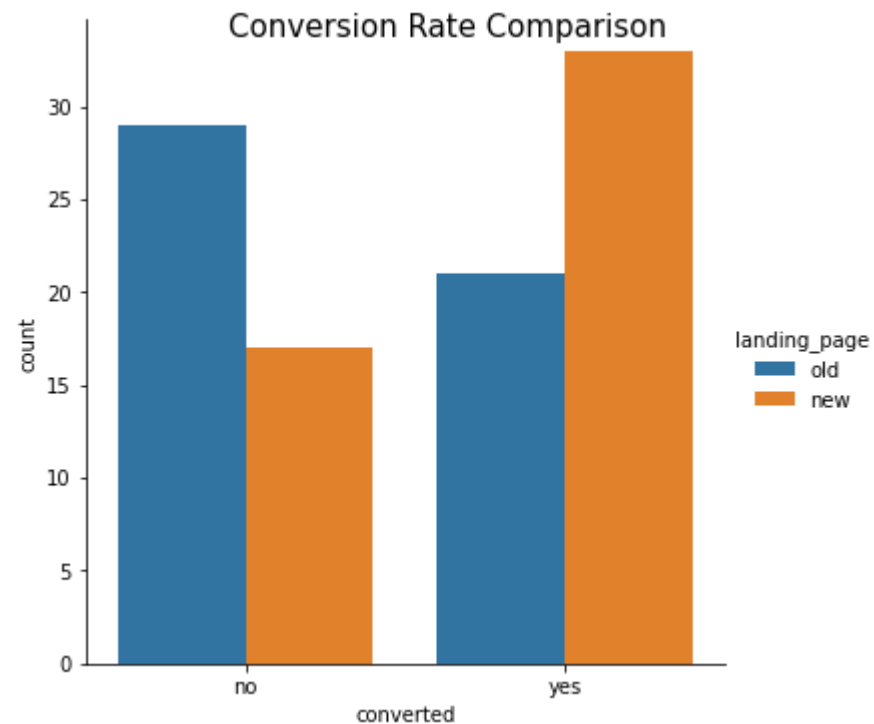
Hypothesis Testing

Time Spent on Landing Page



We see that the mean time spent on the old landing page is less than the mean time spent on the new landing page.

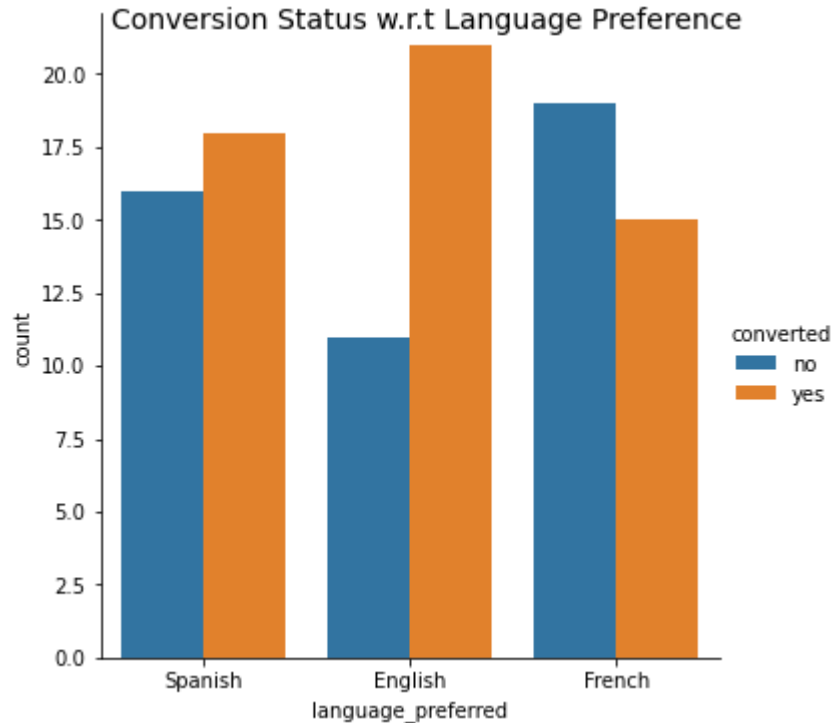
Conversion Rate Comparison



We see that the conversion rate on the new landing page is not the same as the conversion rate of the old landing page.

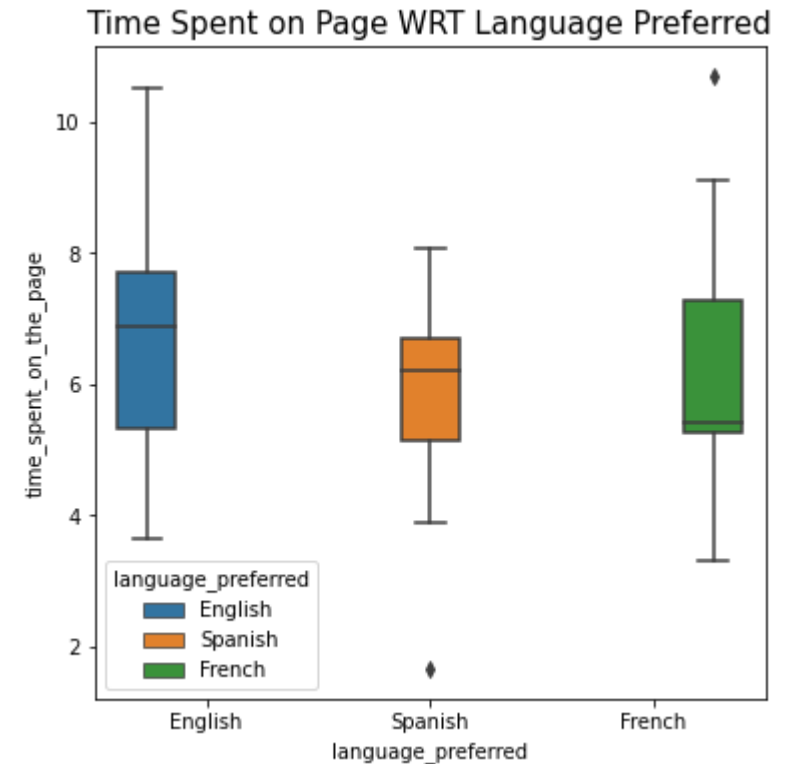
Hypothesis Testing

Conversion Status and Language Preference



We see that the conversion status is independent of language meaning that regardless of the language the page is seen in, it is able to get consumers to convert. However, the conversion rates differ across the 3 languages.

Language on Landing Page Comparison



We see that the mean time spent on the new page with respect to the three different languages is different.

Conclusion

I analysed the 2 sets of customers that were given the pages to explore. From the analysis, I was able to determine the following:

- The conversion rate is about 54%, which is reasonably high.
- English is the least preferred language. However, the difference between it and the other languages isn't significant.
- However, English has the highest rate of conversion.
- The treatment group spent a higher time on their pages
- More time was spent on the new landing page
- The converted customers spent significantly more time on their pages
- The conversion rate for the new landing page is higher than the conversion rate for the old landing page
- The conversion rate doesn't depend on the languages chosen meaning that the new page is fine across all the languages

Recommendation

Based on the analysis, there are following recommendations that can help the business grow:

- The new landing page should be adopted as it is seen to be preferred.
- The old landing page shouldn't be thrown out, but more work should be done to get customers to convert to the new landing page.
- As there is no issue with the language on the pages, all 3 languages should still be kept on.
- However, there should be an investigation into why English has the highest rate of conversion amongst the 3 languages
- The feature has proven to be effective. It should be implemented. However, I suggest a sensitization program for reluctant customers so that they are not lost as customers

Appendices

Question	Hypothesis	Level of Significance	P-Value	Observation	Meaning
Time Spent on Landing Page	Null: $\mu_0 > \mu_1$	0.05	0.0003	Null hypothesis rejected	μ = mean time spent
	Alternate: $\mu_0 < \mu_1$				
Conversion Rate Comparison	Null: $\mu_1 = \mu_2$	0.05	0.0161	Null hypothesis rejected	μ = landing page conversion rate
	Alternate: $\mu_2 \geq \mu_1$				
Conversion Status and Language Preference	Null: Converted status is independent of language preference	0.05	0.395	Null hypothesis NOT rejected	
	Alternate: Converted status is dependent on language preference				
Language on Landing Page Comparison	Null: One of the means is different	0.05	0.4671	Null hypothesis NOT rejected	μ = mean time spent on new page
	Alternate: $\mu_1 = \mu_2 = \mu_3$				