

E-News Express Case Study

E-News Express Data Analysis Project in the Business Statistics Course

March 2023

Contents / Agenda

- Executive Summary
- Business Problem Overview and Solution Approach
- EDA Results
- Hypotheses Tested and Results
- Appendix



Executive Summary

- Purpose was to find if the new landing page had better conversion rates than the current landing page
- Recommendation:
 - Use the new landing page
 - Design future landing pages to have the user stay on the page as long as possible for better conversion rates
- Conclusions
 - New landing page had better conversion rates
 - 66% for the new page vs 42% for the old page
 - Language did not play a factor in converting users
 - The longer a user stayed on the page the more likely they will be converted

Business Problem Overview and Solution Approach

- The goal is to find the if a new landing page had a better conversion rate than the current landing page
- Performed A/B testing
- Utilized data to find the recommendation
- Focused on data from
 - Time spent on each page
 - Conversion rates for each page
 - Language preference impact



EDA Results

- There were
 - 100 rows
 - 6 columns
 - User ID, Group (control or treatment), Landing Page (new or old), Time spent on the Page, Converted (yes or no), Language Preferred (English, French or Spanish)
 - No missing or duplicate data
 - Please see appendix “Data Background and Content” for further breakdown



[Link to Appendix slide on data background check](#)

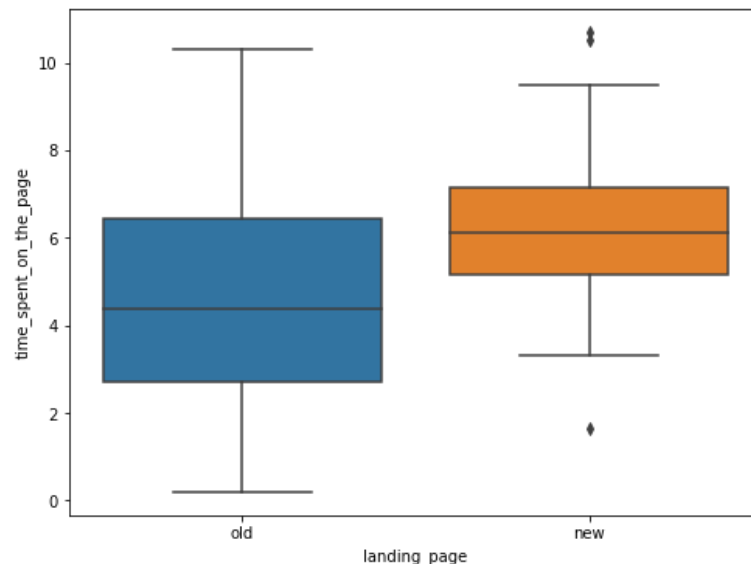
Do the users spend more time on the new landing page than the existing landing page?

H_0 : New Page = Old Page

H_a : Old Page < New Page

We do have enough evidence to support the claim that customers spend more time on the new landing page.

Note: Please follow link below to find out more details



[Link to Appendix slide on details of the test performed](#)

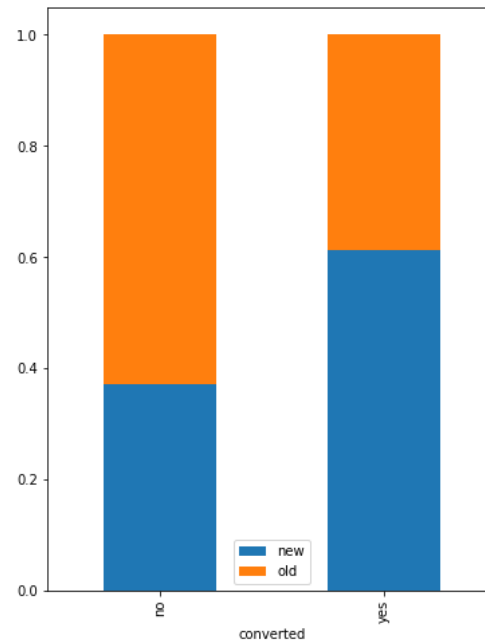
Is the conversion rate (the proportion of users who visit the landing page and get converted) for the new page greater than the conversion rate for the old page?

H_0 : Old Page = New Page

H_a : Old Page < New Page

We do have enough evidence to support the claim that customers are converted more on the new landing page.

Note: Please follow link bellow to find out more details



[Link to Appendix slide on details of the test performed](#)

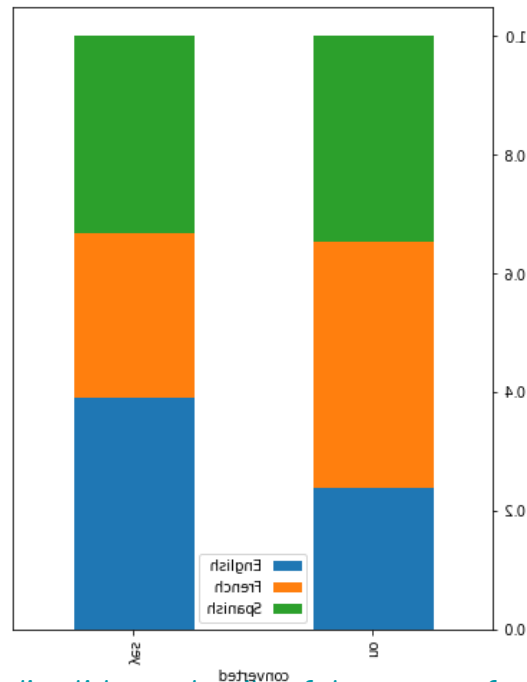
Does the converted status depend on the preferred language?

H_0 : The conversion rate is independent of language preference

H_a : The conversion rate is dependent on language preference

We do have enough statistical significance to conclude that conversion rate is dependent of language preference at 5% significance level.

Note: Please follow link bellow to find out more details



[Link to Appendix slide on details of the test performed](#)

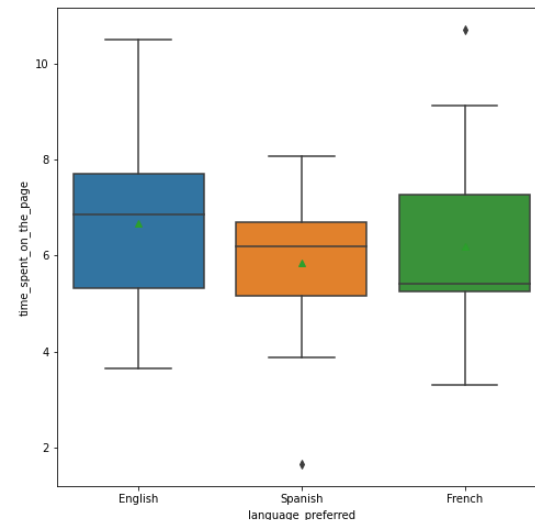
Is the time spent on the new page same for the different language users?

H_0 : English = Spanish = French

H_a : At least one of the languages has a different amount of time spent on the new landing page

We do have enough statistical significance to conclude that at least one of the languages has a different amount of time spent on the new landing page at 5% significance level

Note: Please follow link below to find out more details

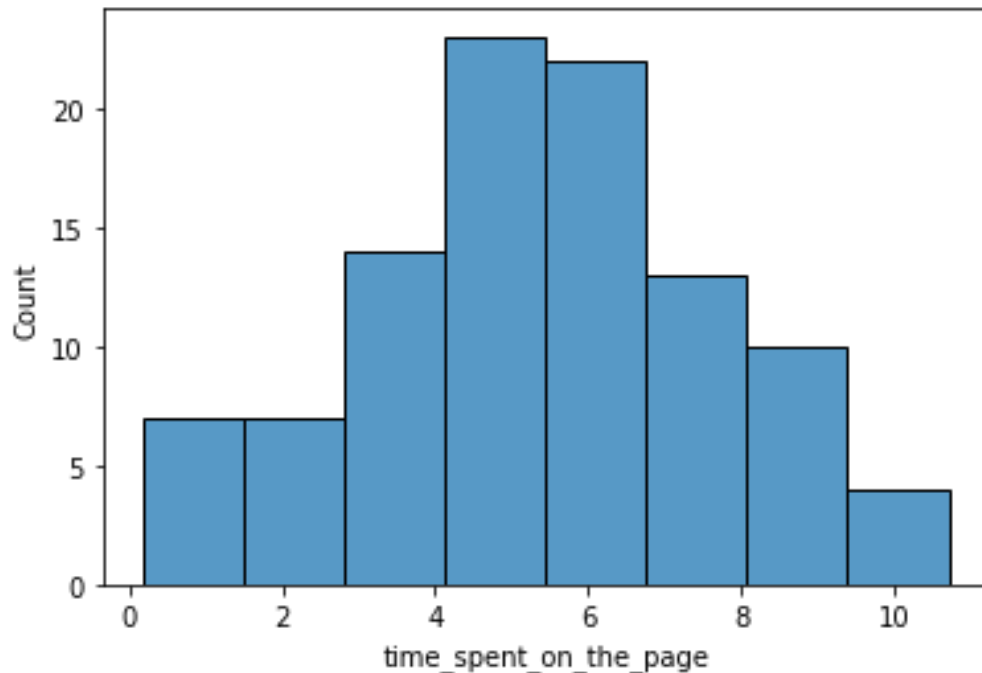


[Link to Appendix slide on details of the test performed](#)

APPENDIX

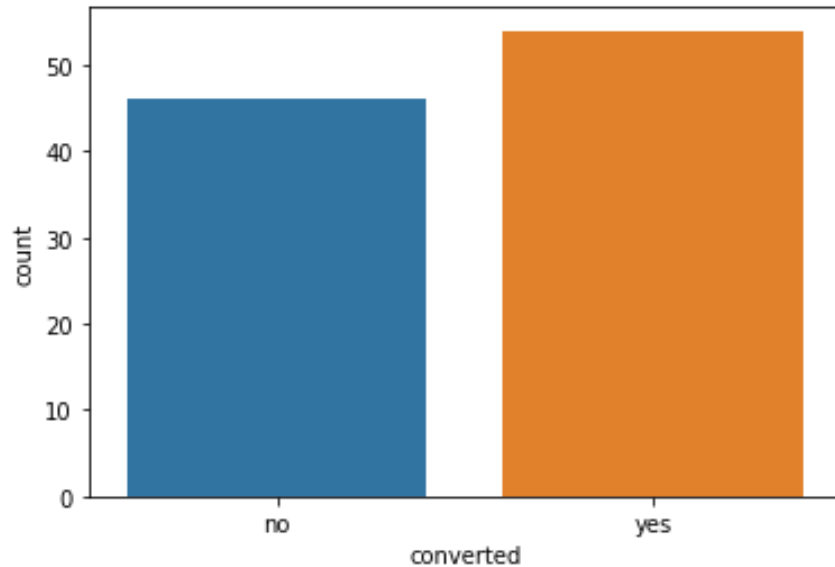
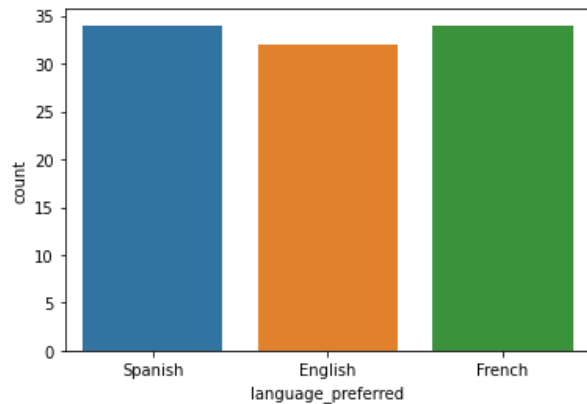
Data Background and Contents

- Time Spent on Page
 - Mean: 5.37 minutes
 - Min: .19 minutes
 - Max: 10.71 minutes
- Group
 - 50 control and 50 treatment
- Landing Page
 - 50 old and 50 new

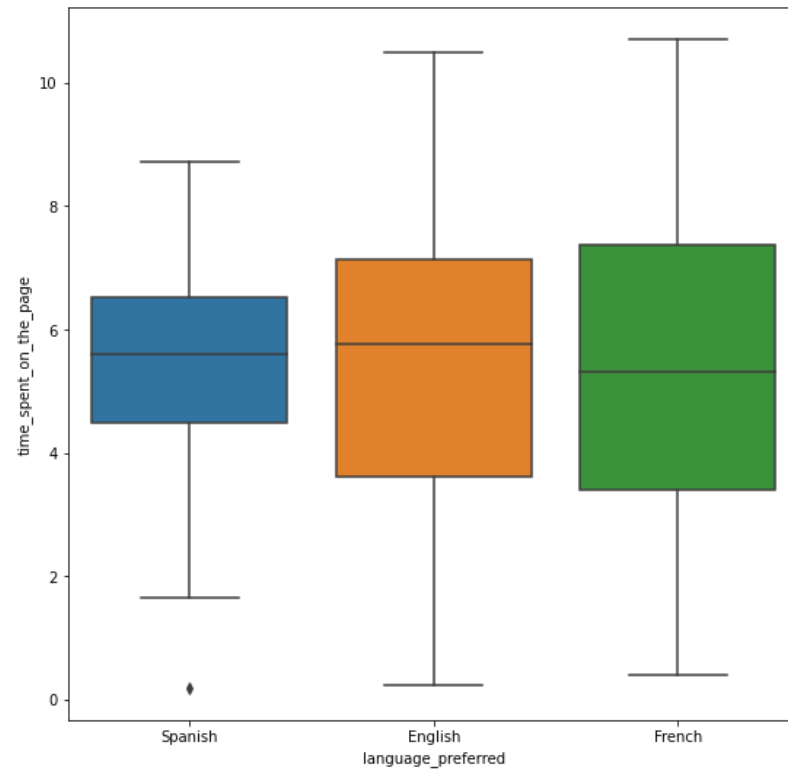
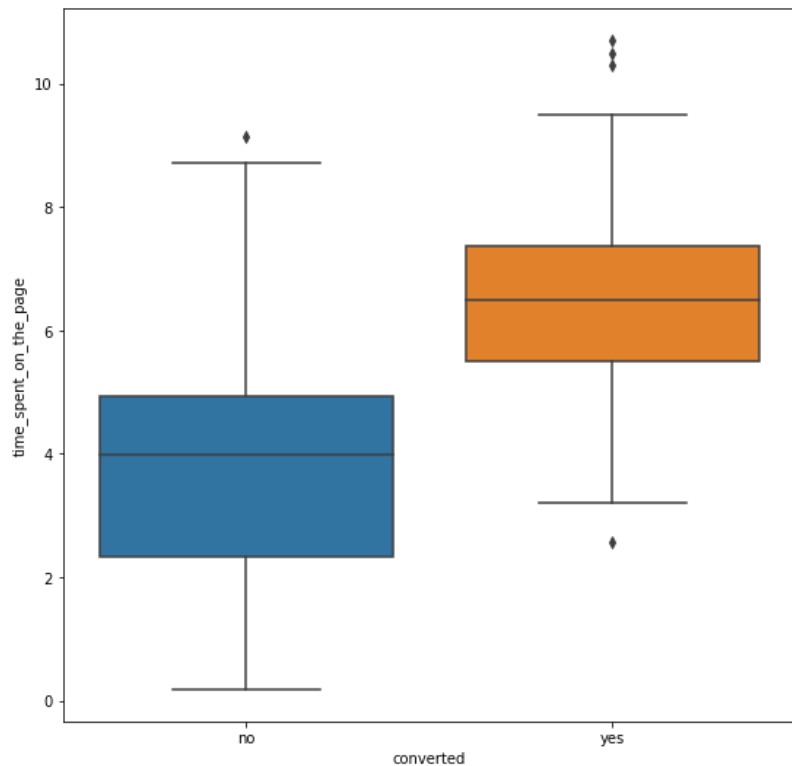


Data Background and Contents

- Converted
 - 54 Yes
 - 46 No
- Language Preferred
 - Spanish (34 count)
 - French (34 count)
 - English (32 count)



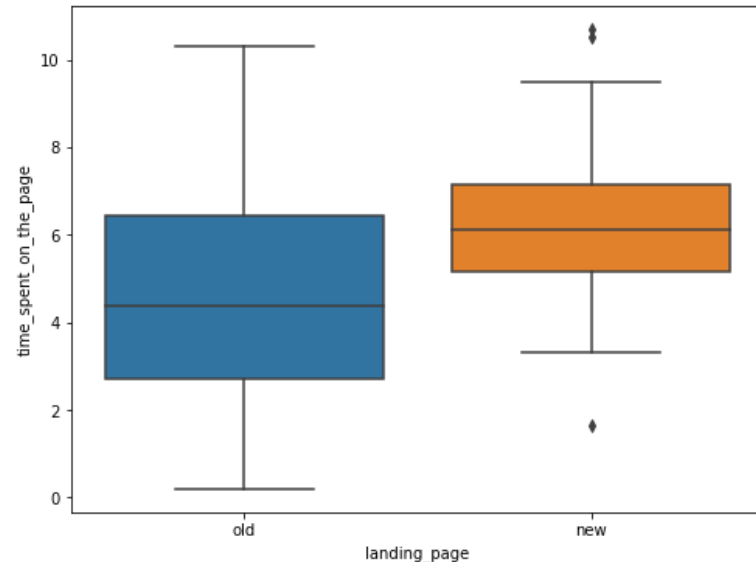
Data Background and Contents



Do the users spend more time on the new landing page than the existing landing page?

Hypothesis Testing Details

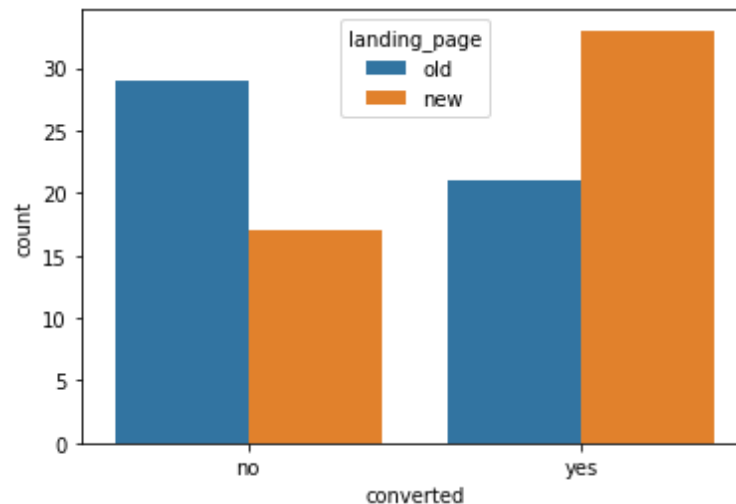
- Null: New Page = Old Page
- Alternative hypotheses: Old Page < New Page
- Two sample Ind T-Test was used
 - `Scipy.stats import ttest_ind`
- P-value obtained: 0.0001
- **Rejected the null hypothesis**
- Standard deviation of the time spent on new page was 1.82
- Standard deviation of the time spent on the old page was 2.58



Is the conversion rate (the proportion of users who visit the landing page and get converted) for the new page greater than the conversion rate for the old page?

Hypothesis Testing Details

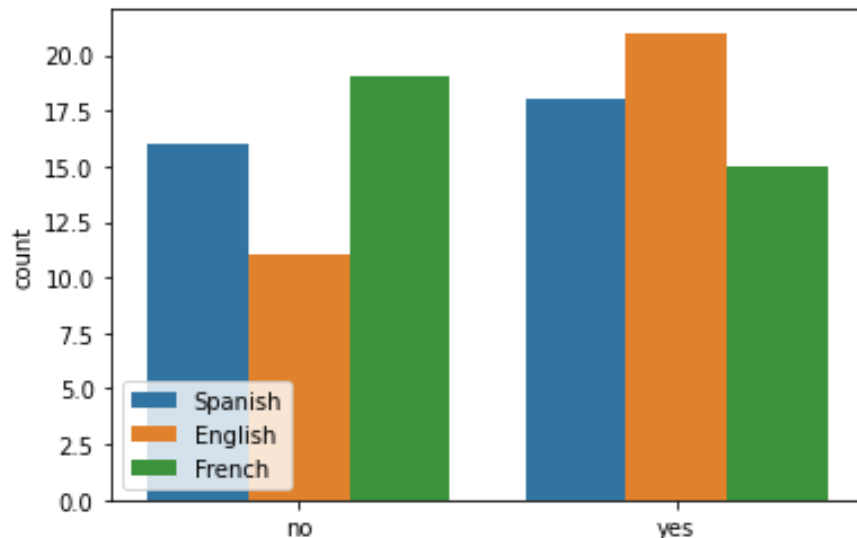
- Null: New Page = Old Page
- Alternative hypotheses: Old Page < New Page
- Two sample Z-Test was used
 - `Statesmodels.stats.proportion import proportions_ztest`
- P-value obtained: 0.008
- **Rejected the null hypothesis**
- Number of converted users on the old page was 21
- Number of converted user on the new page was 33



Does the converted status depend on the preferred language?

Hypothesis Testing Details

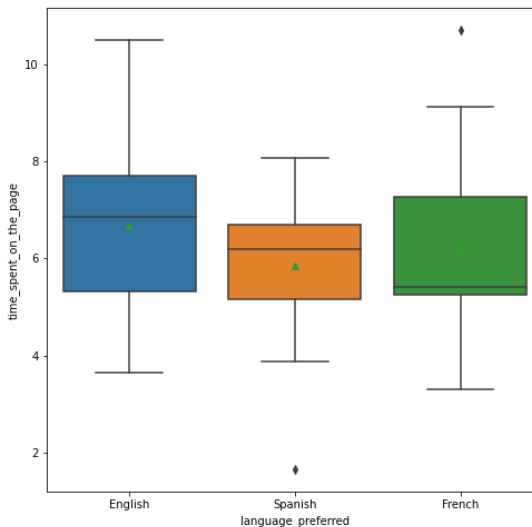
- Null: Conversion rate is independent of language preference
- Alternative hypotheses: Conversion rate is dependent on language preference
- Chi-square-Test was used
 - `Scipy.stats import chi2_contingency`
- P-value obtained: 0.21
- **Rejected the alternative hypothesis**



Is the time spent on the new page same for the different language users?

Hypothesis Testing Details

- Null: English=Spanish=French
- Alternative hypotheses:
 - At least one of the languages has a different amount of time spent on the new landing page
- ANOVA test was used
 - `Scipy.stats import f_oneway`
- P-value obtained: 0.43
- **Rejected the alternative hypothesis**
- Mean time spent on landing page
 - English: 6.63
 - French: 6.20
 - Spanish: 5.84





Happy Learning !

