Test Suite of Personal Website

Hypotheses:

Users perception of the look of the website will decrease as the number of colours in the website will decrease.

Users perception of the feel of the website will not be affected by the variation of colour.

Users perception of the monochrome website will be more informal and relaxing than the original website variant.

Users will prefer variant A over variant B.

Null Hypothesis:

Variants A and B will have no change to the users’ perception.

Test Method:

At least 20 participants, each group having half of the participants within it.

Using A/B testing with counterbalancing via Latin Squares:

|  |  |  |
| --- | --- | --- |
| Ordering of variants | Group 1 | Group 2 |
| Variant A | 1st | 2nd |
| Variant B | 2nd | 1st |

The participants will be given free reign to explore the website with minimal input from experiment team.

After having time with both variants of the website participants will be given a link to the google form to complete (linked below).

The questionnaire will use various question styles such as: Open ended, scalar, multiple choice, and a binary preference question between the two variants.

<https://docs.google.com/forms/d/1yuw7G_BgQFirMTbL9MLjB9LryqSRW46cZKWXi9o1XyM/edit>

Additional notes:

At the start of the questionnaire participants agree to: taking place in the study, they have read and understood the participant information sheet, have had the opportunity to ask questions and had them answered, they have been anonymised and the gathered data can be stored and used for research and they have volunteered with the option to withdraw at any time.

Participant Information Sheet

1. Research Project Title: A Study in HCI (Human Computer Interaction)

2. Invitation You are being invited to take part in this research project. Before you decide to do so, it is important you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part. Thank you for reading this.

3. What is the project’s purpose? This research project aims to investigate how alterations within websites and apps affect user perception of the website or application. The project is a final year project in computer science from Royal Holloway University of London that was chosen by the student.

4. Why have I been chosen? You have been chosen at random to represent a wide demographic that could use the website once completed.

5. Do I have to take part? It is up to you to decide whether to take part. If you do decide to take part, you will be able to keep a copy of this information sheet and you should indicate your agreement to the online consent form. You can still withdraw at any time. You do not have to give a reason.

6. What will happen to me if I take part? You will be asked to complete a web-based questionnaire which we estimate will take you 10 minutes. You can also ask questions throughout your participation or afterwards.

7. What do I have to do? Please spend a few minutes exploring two variants of the same webpage before proceeding to the form for feedback. Please answer the questions in the form to provide us with feedback. There are no other commitments associated with participating.

8. What are the possible disadvantages and risks of taking part? Participating in the research is not anticipated to cause you any disadvantages or discomfort. The potential physical and/or psychological harm or distress will be the same as any experienced in everyday life.

9. What are the possible benefits of taking part? Whilst there are no benefits directly to yourself for taking part, you will be greatly helping the research to progress. This is a learning based research and as such you will be participating in a learning exercise to further the understanding of HCI.

10. What happens if the research study stops earlier than expected? Should the research stop earlier than planned and you are affected in any way we will tell you and explain why. At this point you will be free to withdraw should you wish to.

11. What if something goes wrong? If you have any complaints about the project in the first instance you can contact researcher. If you feel your complaint has not been handled to your satisfaction you can contact the Royal Holloway Computer Science department (information listed below).

12. Will my taking part in this project be kept confidential? All the information that we collect about you during the research will be kept strictly confidential. You will not be able to be identified or identifiable in any reports or publications. Any data collected about you in the online questionnaire will be stored online in a form protected by passwords and other relevant security processes and technologies. Data collected may be shared in an anonymised form to allow reuse by the researcher. These anonymised data will not allow any individuals or their institutions to be identified or identifiable.

13. Will I be recorded, and how will the recorded media be used? You will not be recorded in any way other than your input to the questionnaire.

14. What type of information will be sought from me and why is the collection of this information relevant for achieving the research project’s objectives? The questionnaire form will require input regarding your opinions of the websites you will have been shown and interacted with.

15. What will happen to the results of the research project? Results of the research will be evaluated and compared to hypotheses and a report will be submitted to the Royal Holloway Computer Science department. You will not be identified in any report. If you wish to be given a copy of any report resulting from the project, please provide us with your email address before departing.

16. Who is organising and funding the research? This project is organised by James Green a student at Royal Holloway studying Computer Science. The project is not funded in any way.

17. Contacts for further information:

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Results

Contingency tables

|  |  |  |  |
| --- | --- | --- | --- |
| Variant | Avg Look | Difference | Total |
| A | 8.4 | 1.6 | 10 |
| B | 7.8 | 2.2 | 10 |
| Total | 16.2 | 3.8 | 20 |

|  |  |  |  |
| --- | --- | --- | --- |
| Variant | Avg Feel | Difference | Total |
| A | 8.9 | 1.1 | 10 |
| B | 8.6 | 1.4 | 10 |
| Total | 17.5 | 2.5 | 20 |

|  |  |  |  |
| --- | --- | --- | --- |
| Variant | # Formal | # Non-Formal | Total |
| A | 21 | 7 | 28 |
| B | 2 | 26 | 28 |
| Total | 23 | 33 | 56 |

|  |  |  |  |
| --- | --- | --- | --- |
| Variant | # Informal | # Non-Informal | Total |
| A | 2 | 26 | 28 |
| B | 18 | 10 | 28 |
| Total | 20 | 36 | 56 |

|  |  |  |  |
| --- | --- | --- | --- |
| Variant | # Relaxing | # Non-Relaxing | Total |
| A | 4 | 24 | 28 |
| B | 18 | 10 | 28 |
| Total | 22 | 34 | 56 |

|  |  |  |  |
| --- | --- | --- | --- |
| Variant | Preferred | Non-Preferred | Total |
| A | 16 | 12 | 28 |
| B | 12 | 16 | 28 |
| Total | 28 | 28 | 56 |

Statistics

SciPy will be used within Python to calculate the p-values.

Where mean values are looked at such as the scalar values from the look and feel questions t-test can be used, this paired t test computes the difference within each user which cancels out the unique contribution of each user. This should reduce some noise in the results.

Chi squared is the appropriate test due to not having discreet variable data. I will pass in the contingency tables shown above and the chi2 also calculates the degrees of freedom for the lookup table for p-values based on the chi2 value. Once completed the p-value will be returned. Neither row will be used as the expected values due to not having a well-established design currently in place.

These contingency tables all have 1 degrees of freedom as given by the formula:

degrees of freedom = (# of rows -1) \* (# of columns -1)

If we were to manually calculate the P-values we would follow the procedure detailed below:

The expected rates can be calculated using the following formula:

Expected rate of A =

Expected rate of B =

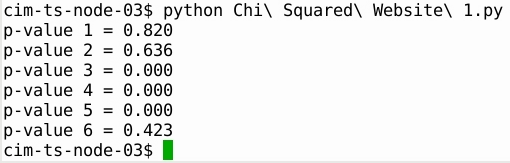
The expected rate is them multiplied by the total of each row to get the expected number for that variant. These figures can then be displayed in a table as shown below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Measured variable | | Inverse of measured variable | |
| Variant | Observed | Expected | Observed | Expected |
| A |  |  |  |  |
| B |  |  |  |  |

For each variant and measured variable and its inverse, we calculate the chi2 with:

Adding all these together gives the final chi2 value. Below is the table of chi squared to p-value for 1 degree of freedom. As can be seen to reject the null hypothesis a chi2 value of at least 3.841 is needed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| P-value | 0.5 | 0.1 | 0.05 | 0.02 | 0.01 | 0.001 |
| 1 degree of freedom | 0.455 | 2.706 | 3.841 | 5.412 | 6.635 | 10.827 |



Results above are all chi2 results change if top 2 are run under t-test either related or independent

Bibliography

Information sheet adapted from: <https://www.sheffield.ac.uk/polopoly_fs/1.401722!/file/InformationSheet.pdf>