VisualPro: Preference Vs. Performance

Research of the Complexity of Preference and Perfomance

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Abstract

The content aims to compare preference and performance to conclude whether preference impacts performance. Ultimately, giving insight into User Usability and if a design based on individual preferences is an impactable approach. Experimentation of the development project involving a lightweight, visual scripting software, 'VisualPro', would help provide results within this study.

Introduction

Research to complete the unfinished Jakob Nielson and Jonathon Levy's 'Measuring Usability: Preference vs. Performance' experiment to determine if preference impacts performance. The usage of the VisualPro project design and creation will support the investigation findings. Suppose it turns out to have a correlation or an indication of good User Usability. The results could change the design of products within projects in the future. It could save the cost and time of the development by listening to the target audience instead of fixing User Usability problems after deployment of the product.

The target audience of the project used for this study is the following members of the public:-

- **Experience Level:** Novice-Intermediate.
- **Expertise:**
  - Software Engineering.
  - Artifical Intelligence and Machine Learning.
  - Web Development.
  - Game Development.
  - Science (Statistics/Data Analytics).

For this experiment to work, two studies details how the target audience would like the Graphical User Interface and the type of functionality they would like to see within the project, and then test the final product with the target audience. After collecting the two studies, these are then compared with Fuzzy Expert logic to categorise each survey into three categories, 'Hard Usability', 'Moderate Usability' and 'Hard Usability'. Cross-referencing the two data results enables comparing Preference and Performance in a User Usability environment.

Main Objectives

1. Conduct two surveys involving the preference of the target audience to construct the end-product, VisualPro.
2. To work out the weights applied to each category for the Fuzzy Expert logic transition.
3. Analyse the two studies and find out the correlation between the two results and see if it forecasts any patterns of User Usability in general.

Materials and Methods

To conduct the experiment, the VisualPro project will uses two methodologies to design and develop the project. These include the Quantitative, Descriptive and Fundamental research methodologies. The Quantitative research methodology would help construct the initial survey to have a clear indication of what User Usability features the target audience would like. Whereas the Descriptive and Fundamental research helps identify the User Usability diffulcities and identifies well-known novice struggles when learning how programming works and how to navigate the software. This would help constructing the survey data found in the final study. For the final survey to work with novices', two tutorial documents that covers both Object-Oriented Programming and Functional Program styles to teach the users different methods available within the software.

Performance Fuzzy Logic Setup:-

Mathematical Key:

$\mathcal{U}$ = Usability Categories: 'Hard Usability', 'Moderate Usability' and 'Easy Usability'.
$\mathcal{P}$ = Performance Categories: 'Very Low', 'Low', 'High' and 'Very High'.
$\mathcal{VL}$ = Performance Category: 'Very Low (0%)'. - $\mathcal{L}$ = 'Low (25%).'
$\mathcal{H}$ = Performance Category: 'High (75%)'. - $\mathcal{VH}$ = 'Very High (100%)'.
$\mathcal{R}$ = Responses with Performance Categories. - $\mathcal{T}$ = An array of responses.

$$\mathcal{U} = \sum_{n=0}^{3} \frac{100}{3} - (n = n + 5) \rightarrow \left| \mathcal{HU}\ \mathcal{MU}\ \mathcal{EU} \right|$$

$$\mathcal{P} = \frac{100}{4} \rightarrow \left| \mathcal{VL}\ \mathcal{L}\ \mathcal{H}\ \mathcal{VH} \right|$$

$$\mathcal{R}_P = \left| T_n \right|$$

$$\sum_{n=1}^{n<R_n} \mathcal{M}_{\setminus} = \frac{R_i}{R_T}$$

Essentially to work out the Performance figures, calculation of the code submissions within the survey to generate a percentage. Four statements measured by $\mathcal{P}$, 'The respondent followed the task correctly', 'The respondent seems to have followed the task correctly', 'The respondent seems to have followed the task incorrectly' and 'The respondent followed the task incorrectly' helps to determine the performance level. Each respondent's results are tallied up and positioned in the $\mathcal{R}_\mathcal{P}$ array, which provides a performance level of each respondent. Sum of $\mathcal{P}$ of each $\mathcal{R}$ element and then divided by the $\mathcal{T}_\setminus$ provides an average percentage. The $\mathcal{U}$ identifies the Fuzzy Expert categories percentage with added weights. The weighing strategy should enable the analysis to be unbiased.

From the initial survey, a selection of two preference questions including Figure **??** - 'According to you, how should the features of the Graphical User Interface have to work?' and Figure **??** - 'How would you prefer to access the software?' helps work out the preference level. A calculation to sort out each categories with the responses and whether or not the preference is within the VisualPro design implementation. To filter the preference down, only the preferences within the VisualPro design implementation are taken into account. The mean of the preference of each category is then calculated and then inserted into the Fuzzy Expert logic. The preference and performance levels are then compared to determine the overall User Usability and analyse whether preference affects performance.

Results

Table **??** shows the performance level of each respondent. The study collects qualitative data of each task a respondent attempts and are measured by four statements:-

'The respondent followed the task correctly' - 100%
'The respondent seems to have followed the task correctly' - 75%
'The respondent seems to have followed the task incorrectly' - 25%
'The respondent followed the task incorrectly' - 0%

Performance	Response 1	Response 2	Response 3	Response 4	Response 5	Response 6
100%	3	2	2	1	2	6
75%	4	3	4	4	1	1
25%	1	3	0	0	1	0
0%	0	2	2	3	3	0
Mean Average:	78.13%	65.63%	62.5%	50%	37.50%	59.38%

Table 1: Performance Results

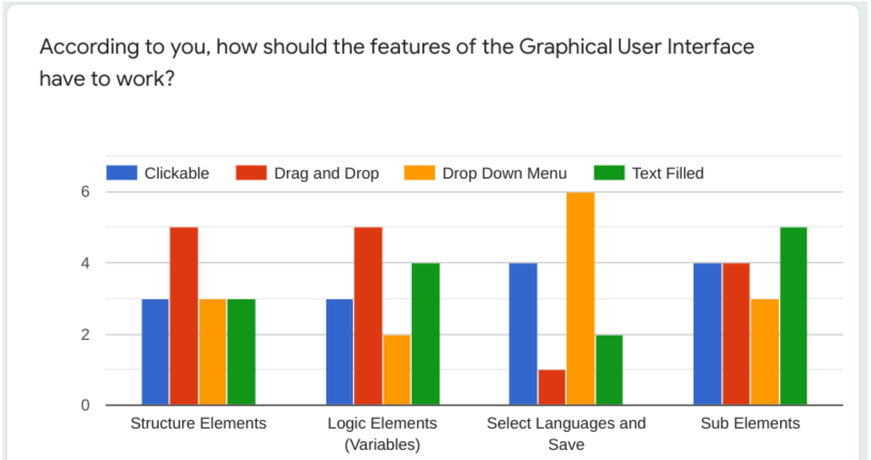

Figure 1: Survey Question 11 - Found at: Original Image

In hac habitasse platea dictumst. Etiam placerat, risus ac.
Adipiscing lectus in magna blandit:

Figure 2: Fuzzy Logic - Preference and Performance

Vivamus sed nibh ac metus tristique tristique a vitae ante. Sed lobortis mi ut arcu fringilla et adipiscing ligula rutrum. Aenean turpis velit, placerat eget tincidunt nec, ornare in nisl. In placerat.

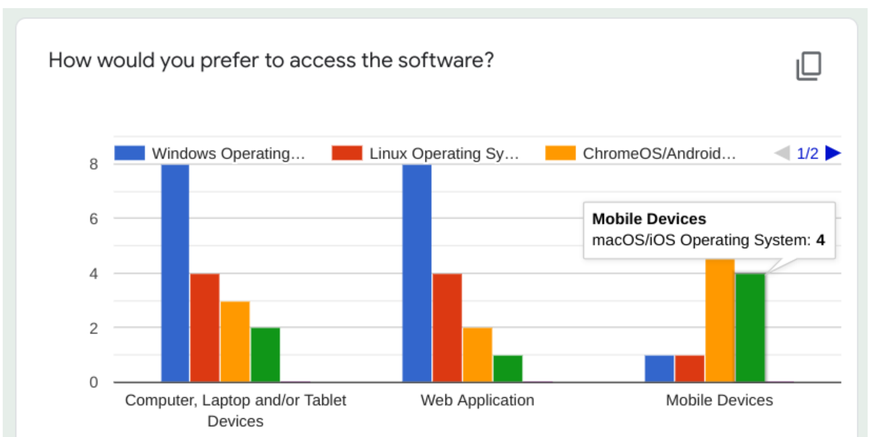

Figure 3: Survey Question 12 - Found at: Original Image

Conclusions

- Pellentesque eget orci eros. Fusce ultricies, tellus et pellentesque fringilla, ante massa luctus libero, quis tristique purus urna nec nibh. Phasellus fermentum rutrum elementum. Nam quis justo lectus.
- Vestibulum sem ante, hendrerit a gravida ac, blandit quis magna.
- Donec sem metus, facilisis at condimentum eget, vehicula ut massa. Morbi consequat, diam sed convallis tincidunt, arcu nunc.
- Nunc at convallis urna. isus ante. Pellentesque condimentum dui. Etiam sagittis purus non tellus tempor volutpat. Donec et dui non massa tristique adipiscing.

Forthcoming Research

Vivamus molestie, risus tempor vehicula mattis, libero arcu volutpat purus, sed blandit sem nibh eget turpis. Maecenas rutrum dui blandit lorem vulputate gravida. Praesent venenatis mi vel lorem tempor at varius diam sagittis. Nam eu leo id turpis interdum luctus a sed augue. Nam tellus.

Acknowledgements

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