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# Usability Test of Personality Type within a Roommate Matching Website: A Case Study



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# Usability Test of Personality Type within a Roommate Matching Website: A Case Study

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#### **ABSTRACT**

We designed and built a roommate matching website, exclusively for students, which allow students to have a central point in which they can meet credible roommate candidates, search for verified housing, and easily reach out to these individuals to further their relationship, and eventually share living space. Our website aims to allow a user to search for compatible roommates not just by living habits, but by tying in the personality of candidates in reference to their own personality type. This type of personality matching in conjunction with a standard behavioral survey is the basis of the algorithm used for roommate matching. In addition to designing and building this website, we also conducted a research around two questions. First, does the idea of personality type in conjunction with living habits have the capacity to form a stronger foundation on which roommates can be selected? Second, is there a means in which we can collect this information from a user and apply it, while avoiding the typical result of survey fatigue that is inherent in existing personality quizzes? We found that majority of our respondents felt that knowing the personality compatibility would influence their decision of sharing a living space with someone. Our respondents also preferred a more visual and interactive quiz to determine personality type in comparison to questionnaires.

Keywords: Roommate matching, personality test

#### INTRODUCTION

As students are accepted into universities, they are met with a unique situation in which they are displaced from their current living quarters. This presents both new opportunities and points of stress for these individuals. Our website aims to alleviate this stress by allowing students to have a central point in which they can meet credible roommate candidates, search for verified housing, and easily reach out to these individuals to further their relationship and eventually room together. Currently, students use social networking forums, advertisement forums and word of mouth for their house and roommate search. These current methods include varying concerns around the reliability, credibility and authenticity of the information collected and presented to their users. Additionally, there can be concerns of reliability including transferring money through an insecure site, readily trusting online individuals who have not been properly vetted, and above all, taking the time to sift through this deluge of information without a proper direction or methodology. In a situation where a user has produced a short-list of housing options but needs a holistic comparison of these options, the main solution available right now is to spend hours manually collating this information. In addition, once a house has been selected, students will likely begin to search for roommates in a similar but inefficient manner. These users do not have a consistent basis on which to separate compatible roommates from the massive pool of candidates.

Our website aims to allow a user to search for compatible roommates not just by living habits, but by tying in the personality of candidates in reference to their own personality type. This type of personality matching in conjunction with a standard behavioral survey is the basis of the algorithm being produced for this site. The purpose of this paper aims to answer the following questions. First, does the idea of personality type in conjunction with living habits have the capacity to form a stronger foundation on which roommates can be selected? Second, is there a means in which we can collect this information from a user and apply it, while avoiding the typical result of survey fatigue that is inherent in existing personality quizzes?

The remaining of the paper is organized as follows. Section 2 reviews the related literature works. Section 3 presents the work and findings at the first round of web design. Section 4 describes the second-round work that is carried out to incorporate the lessons learned from the first round. Section 5 concludes the paper.

#### LITERATURE REVIEW

Finding compatible roommates is always a topic for college students, as the decision is intimate enough to affect their daily lives. There are many research studies about how various attributes, like habits, races, personality and others, would impact roommate relationship development and people's social lives (Towles-Schwen & Fazio, 2006; Laar, Levin, Sinclair, & Sidanius, 2005; Wetzel, Schwartz, & Vasu, 1979; V.West, Pearson, Dovidio, Shelton, & Trail, 2009; Sillars, 1980; Thompson, 1982). Various tools have been applied to the roommate finding problem (Astrachan, 1992; Gusfield, 1988; Erlandson, 2009; Klaus, Klijn, & Walzl, 2010). The focus of our project is to develop a user-friendly online roommate matching website by providing a platform that allows users to submit profiles, which will then be used to find their matching roommates. In addition to

personal habits and backgrounds, the existing research results suggest that personality plays a critical role in roommate compatibility (Carli, Ganley, & Pierce-Otay, 1991; Lapidus, Green, & Baruh, 1985; Markey & Kurtz., 2006). So the web design focuses on the way of collecting user personality information. The case study being presented contains two fronts. The first is looking into the usability of personality types in conjunction with roommate behavior surveys in order to assess roommate compatibility. The second is the use of various presentation mediums over the standard form in order to avoid survey fatigue, but to still acquire the desired information given the task at hand. Jungian Type Index (JTI) has been considers as useful indicators for personality (Chanin & Schneer, 1984; Carlson, 1985). So this project uses JTI as a way of evaluating personality. A common way to solicit user profile is through questionnaires. Survey fatigue is a known phenomenon, both from a respondents and producers point of view (Porter, Whitcomb, & Weitzer, 2004; Gofton, 1999; Savage & Waldman, 2008). It was seen that as the number of surveys increases, the likelihood of garnering a response with each subsequent survey was diminished.

It was determined that a number of factors came into play such as the number of surveys, the free time of the individual chosen as the respondent, and the salience of the survey in regards to the respondent's current disposition. Respondents who did not complete the survey stated time as a main factor for incompletion of the survey, whether it was because they "never got around to it", were "too busy", or it was given "at a bad time". In the project, we try different forms of quizzes to find the better way to collect accurate user information to improve the accuracy of roommate matching. By replacing the typical questionnaire format of a survey with something deemed more engaging, we attempt to increase the salience of the quiz material by keeping the respondent engaged in the content. As for timing, the intent is that only those who are actively looking for a roommate would come across such survey in the first place. This would increase the salience of survey content as well as minimize the response from an individual along deeming the administration time as the "wrong time". Also by attempting to minimize the number of responses required to get to the JTI result, we are attempting to minimize the length of subsequent surveys, as the end algorithm relies on the values from all three surveys we are presenting to the user for the purposes of finding a roommate.

#### **ROUND 1 OF SURVEY DESIGN AND ANALYSIS**

The primary focus of this project is to build a working prototype for a roommate matching algorithm and website. In general, matching algorithms are optimized and tuned to different features and weights of a specific use-case. The algorithm attempts to use the living habits, roommate preferences and personality-type of a user to match them with other users. The system will allow users to enter roommate preferences and personal living habit details through a questionnaire. For the purposes of this research, the personality type will be captured through a medium resembling a game, as opposed to the typical multi-questioned form. The data gathered from both the personality game and profile/preferences form are what the end algorithm will act upon to produce a percentage match between users. The profile and preference form both produce well-structured data in the form of yes/no questions that query specific living habits of the individuals and of the preferred habits they would like to see in their roommate, respectively. Both forms also ask the user to assign a weight to each question to indicate the importance of each behavior. The results gathered from the personality game is a Jungian Type Index (JTI) that corresponds to the selections made by the user over the course of the game. In order to get feedback

on the idea of using an engaging survey method to determine a user's personality type, a survey was developed. The survey had three sections: a flash card based (game like) quiz, a questionnaire based quiz and a feedback form. The flash card based quiz comprised of a series of cards that the user would select to determine their type. These cards were designed to contain properties of the existing JTI - Extraversion/Introversion, Sensing/Intuition, Thinking/Feeling, and Perceiving/Judging. Each card fell into one of the JTI's and displayed that type on purpose as seen in Figure 1.



Figure 1: Example of a Choice to Be Made in Card Based Quiz.

The cards were presented to the user in pairs of opposite types, at which point the user would select the card that matched their disposition at the time of administration. The cards were then stacked at the bottom for quick reference. As the user completed the quiz, their stacked cards would begin to indicate what JTI they were aligning with. A user was presented with a total of 20 decisions to make, with 5 cards per JTI containing text that aligned to that index. By the time the user was finished with this quiz, the data collected was their result and the time it took them to select each card. The purpose of the questionnaire based quiz was to have a baseline to evaluate the results of the flash card based quiz. The secondary intent was to place the respondent in a scenario where they would fill out a personality quiz that is more akin to the traditional survey, which would allow us to get feedback between variations. The test comprised of 54 questions; each question having three answer choices - Yes, No and 50/50. Users were expected to answer all the questions to get their personality types. Furthermore, selection of the 50/50 option throughout the test did not yield any result at the end, but was still a viable option.

The final and most valuable part of our survey was the feedback section. Here, we attempted to capture the mindset and intent from respondents. The feedback section comprised of 3 questions:

- Q1: Do you prefer the visual card based personality quiz in comparison to the questionnaire?
- Q2: Assuming you were looking for roommates, will you be willing to take a personality quiz in order to find a great roommate?
- Q3: Would knowing a potential roommates personality influence your decision to share house with him/her?

The study is conducted on a group of 28 student volunteers in the online fashion. Volunteers are instructed to complete two types of quizzes both put online and fill out the online feedback form of three questions.

The first analysis performed on the results of the round one survey was comparing the results of the flash card based and questionnaire based quizzes. A significant advantage of the flash card based quiz over the questionnaire based quiz is that it is engaging and takes much less time. However, we want to know if the flash card based quiz captures the true JTI value of users. To this end, we compare the JTI values (a set of four indicators - Extraversion/Introversion, Sensing/Intuition, Thinking/Feeling, and Perceiving/Judging) returned by the flash card based and questionnaire based quizzes. In Figure 2, we see that about 20% of the responses matched exactly. About 37% matched 3 out of 4 JTI, 17% matched 2 out of 4, and 23% matched only 1 out of 4. Only 3% was seen to be completely different between both quizzes. Due to the nature of personality quizzes, results can change even for the same person taking the same quiz during different times. Assuming the questionnaire based quiz is the ground truth, the flash card based quiz reveals acceptable amount of personality information

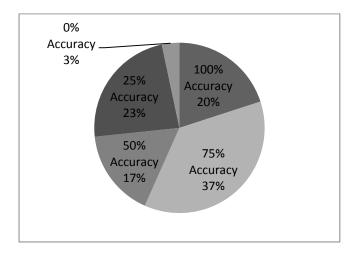


Figure 2: Match Percentage between Flash Card Based and Questionnaire Based Quizzes at Round 1.

Next, we examine the answers to the feedback questions. Q1 asks if the users prefer the flashcard based quiz over the questionnaire based quiz. The poll shows that about 80% respondents prefer the flashcard based quiz. The result confirms our initial conjecture that people prefer the survey form that is engaging and takes less time. The result combined with the prior finding on the similarity of results returned by the two different types of quizzes demonstrates the advantage of the flashcard based quiz.

Q2 asks if a user is willing to take personality quiz to find roommate. The collected result shows that approximately 60% of users are willing to take a personality quiz to find roommate, while about 40% are inclined to skipping the personality quiz. The result is slightly different from our expectation. Our prior guess is that a significant majority of respondents are willing to take a personality quiz. So to clear our concern, we actually got to know the audience in person after conducting the survey. By conversations, we found that respondents who are not interested in the

personality test already had roommates and are happy with their current situation. But our survey design did not sufficiently present this question to the respondents and hence failed to capture the underlying fact.

Q3 asks users if knowing a potential roommates personality influences their decision. The result shows that more than 70% round-one respondents feel that knowing the personality type of their roommate candidates would potentially impact their decision to eventually room with them. The result agrees with our prior assumption and confirms the necessity of including the personality type in the roommate matching decision.

Survey fatigue was observed and measured by counting how many respondents successfully completed all 2 quizzes. We found that 59% of the respondents completed all 2. Unfortunately, we did not have a means of capturing the reasoning why the other 41% skipped the questionnaire based quiz. This could have been willingly, or it could have been attributed to the unclear instruction set presented to users during the first round of survey. But our guess is that the questionnaire based quiz has too many questions and survey fatigue made respondents quit early.

#### Lessons learned from round 1

Based on the feedback and results of survey round one, a few limitations of this iteration came to light. Certain pieces of the feedback called out various inconsistencies in the three tests being presented. Missing generic demographics such as gender and age severely limited the number of analysis points that could be constructed over the gathered data. Also the nature of certain feedback questions was causing a deviation in the true intent of the question and the answers being given. The major inconsistency that was discovered between the survey quizzes was the presence of a "50/50" option within the questionnaire based quiz. The general feedback around this is that a 50/50 option would be preferred. These users felt that they could not easily agree with "black or white", but instead desired to opt for a middle ground given their changing disposition. While this is viable as far as determining the indecisive nature of an individual, the presence of a 50/50 in our quiz would allow users to easily forego any real decision during the process of taking the personality quiz, thus diminishing the value of the personality type and subsequently the presence of personality in the roommate algorithm. While viewing the results of the external quiz, the 41% who skipped that quiz were attributed to a poor instruction set and unclear structure.

For round one, users were presented a field to insert their name, after which point they were to begin with the quizzes without any indication as to the expectation or structure of the survey. It was found that those who spent time lingering on the questionnaire based quiz page eventually discovered the presence of a feedback form and completed it, at which point we could get their feedback. Anyone who decided the external quiz was too long, or did not find it at all, simply closed the page. At that point, their results for the external quiz would show up as null and we would not have any feedback from them to indicate why they either willingly or unknowingly skipped that quiz. The feedback questions for the first round were focused on determining if a user would have a preference in a game type presentation over the traditional survey. The questions presented initially were not worded in a manner to get this information reliably, and the presence of a 3rd option on the external quiz skewed the preference. As stated earlier, there was a general

preference towards having that "50/50" option and as such, the feedback requested that option instead of focusing on the value of quiz presentation.

There was also a feedback question which aimed to gauge whether or not personality type would be considered viable in the eyes of the user, but the users who gave the feedback of "no" were already happily roomed and had no intent of finding new roommates anytime soon. The question was unclear in pointing out the true nature of its purpose, which was more along the lines of being put into the scenario of finding roommates, and whether personality type would bring value to that decision. The final limitation was discovered to be in the lack of demographic information that was requested. Initially it was determined that this information would not be necessary given the intent of the survey. During analysis, however, it was discovered that without various types of demographic information at which to slice the data, it was difficult to build various pictures and stories around the data that was gathered.

#### Modification of survey design based on lessons learned

The limitation found in the round one survey uncovered enhancements that could be implemented to better direct the respondents focus. This included changes to the instruction set, changing the external quiz, expanding upon the feedback section, and gathering additional demographic information. The idea was that with a second round of surveys, the intent could be clarified and as such, the results and feedback of round two would focus on the value of personality type integration as well as clarity in the value of presenting a survey in a game type fashion. The first major change came occurred with the external survey. As stated earlier, the intent was not on having the user feel comfort in their indecision, but instead to drive the user to determine what their personality type was at the time of taking the quiz so that this information could be used to determine compatible roommates. With that, the questionnaire based quiz was altered to one which did not include a 50/50 option, but instead presented a series of yes/no situation questions. This change was included to minimize the number of variables between the guizzes being presented to users. To correct the null results being seen in the external quiz, two modifications were made. The first is that the instruction set at both the beginning and during each piece of the survey was enhanced. This was done to better indicate the structure of the test, as well as where the user was each step of the way. It was made clear that they should expect to see two quizzes, then a feedback section. The second modification was that a skip button was added to the feedback survey. The survey indicated that the preference was towards a respondent completing the feedback survey as to save the results, but the greater value was placed on the feedback that a user could give in regards to all surveys comparatively. These modifications ensured that users were aware of both the fact that there was a feedback survey, and that their feedback was valued regardless of whether they decided to finish the two quizzes. The feedback was modified to clarify the intent of the survey altogether, as well as try to avoid a user simply stating that they would have no need for a new roommate in the near future, thus rendering the survey moot. This was done by altering a question to include a hypothetical situation in which new roommates were needed, as well as asking if a user already had roommates in their current situation. The section was also modified to ask a user why they had potentially skipped the external quiz. A question was also added to attempt to gauge the value of having personality type present while making the decision of who to live with as a roommate. The demographics were modified to ask a user for both their age range and gender.

While not directly applicable to the research at hand, this change was made to allow the results to be sliced further and find any correlations not otherwise apparent.

#### **ROUND 2 OF SURVEY DESIGN AND ANALYSIS**

With the enhancements in place, the second round survey contained the same overall structure as the first round. Major changes included a clearer instruction set, demographics information request, removal of the 50/50 option in the questionnaire based survey, and an update to the feedback questions. The updated feedback questions were the following:

- Q1: How much would you value knowing a potential roommate's personality comparability as compared to yours (using a 1-5 rating scale)? Why?
- Q2: If you were moving out tomorrow and had to find new roommates, would personality type compatibility influence your decision in finding a roommate? Why?
- Q3: Which type of quizzes did you prefer? Why?

The first analysis we did on the results of round 2 surveys was to compare the personality type identified by the flash card based and questionnaire based quizzes. Based on those results, we see that about 22% of the responses matched exactly. About 32% matched 3 out of 4, 36% matched 2 out of 4, 10% matched only 1 out of 4, and no entry completely different between both quizzes. The results are plotted in Figure 3. By comparing the results of round 1 and round 2 we observe that by removing the 50/50 option, the results returned from the flashcard based quiz agree more with the questionnaire based quiz. It further confirms the ability and accuracy of the flashcard based quiz in capturing the personality type of respondents. We should note at this point that the result of same personality quiz, of taken by an individual, in different moments of his/her life can give completely different results.

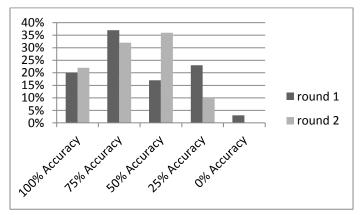


Figure 3: Comparison of Round 1 and Round 2 w.r.t Match Percentage between Flash Card and Questionnaire Based Quizzes.

We had two main priorities for round 2 of our survey. Our first priority was to take feedback from our respondents on how much they would value knowing a potential roommate's personality compatibility with their own personality. As reflected in Q1, we asked them to choose this value on a 5 point scale with 5, 4, 3, 2, and 1, that represent extremely valuable, very valuable, minor value and does not matter respectively. 45% respondents said this information would be extremely valuable to them. 26% and 19% said this information would be very valuable and

valuable respectively. Only 10% of our respondents said this information would hold minor value for them. The results are plotted in Figure 4. We also asked our respondents if knowing the personality type compatibility of a potential roommate influence their decision of sharing a living space with someone. 88% answered yes. The results basically agree with the findings drawn from the round 1 and confirm the importance of personality test in the design of a roommate matching website/algorithm.

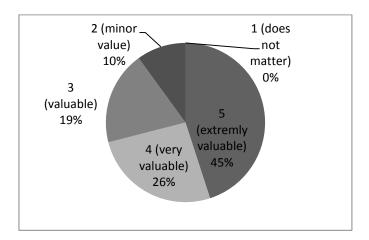


Figure 4: Perceived Value on the Importance of Roommate Personality in Roommate Finding Surveyed at Round 2.

Our second priority was to give people the opportunity to take our visual card game based quizzes and a generic questionnaire based quiz and give us feedback on which quiz they preferred and why. 79% of our respondents said they preferred the flash card based quiz. The major reason was that it felt easier since it was broken down and it was easier for them to read and process the information. Few respondents commented that they liked the cards and idea of selecting from two options instead of the traditional format which felt endless. Many respondents felt that they could focus better on making one choice at a time, instead of wondering ahead to the other questions. 21% of our respondents preferred questionnaire based quiz, which was the questionnaire based quiz, the main reason being they felt that more questions meant that the quiz would do a better job at identifying their personality type. The results again suggest the necessity of an engaging and less time-consuming survey form and its importance in improving user experience and enhancing accurate user information collection.

#### **CONCLUSION**

Through our research we can make two major observations. The first is that majority of our respondents preferred the visual card based quiz in comparison to the long questionnaire in both our rounds. Our second observation is that majority of our respondents said that knowing the personality compatibility would influence their decision of sharing a living space with someone and they think personality compatibility information is extremely valuable. The next steps would be to improve the questions in the visual card based quiz, identify the optimum number of questions that should be asked to identify a person's personality type with minimum room for error, have respondent take the survey with different sequences of questionnaire and card based quizzes. Once this website is rolled out, it would be interesting to take feedback from users after a year to

revisit the compatibility matrix and see if it is consistent with our respondent's actual experience with their roommates. To arrive at concrete conclusions we need more research in this area. It would also be beneficial to have more respondents take this survey so that we have more data to analyze. As this website is currently at the start-up phase, we do not have enough data to evaluate if our website can provide better roommate matching results than others. In the future when we have a sizable user base, we plan to send out surveys to users who find roommates through our services and collect their feedbacks. Our future work will also explore the design of better roommate matching algorithms based on collected data.

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**Mrinalini Shekhawat** currently works as a Quality Assurance Analyst at InfoBlox. Mrinalini holds a MS in Information Systems from Santa Clara University and was inducted into the Santa Clara University-Graduate Chapter of Beta Gamma Sigma. She graduated top of her class with a Bachelor's degree in Electrical Engineering from India. She has previously held various technical positions with Accenture India, ranging from Software Engineer to Team Lead.

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**Gabriel Monroy** currently works as a Customer Support Engineer for Cisco, specifically on the Application Centric Infrastructure (ACI) technology. In this role, he works closely with customers and engineering to ensure the product works as designed and meets customer expectations in a rapidly changing SDN market. He graduated from Rensselaer Polytechnic Institute as an Electrical Engineer, and is slated to complete his Masters in Information Systems at Santa Clara University.

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**Dr. Haibing Lu** is an assistant professor in the Department of Operations Management and Information Systems at Leavey School of Business in Santa Clara University. He received the Ph.D. degree in Information Technology from Rutgers University in 2011. His research is at the confluence of privacy, security, data mining, and optimization. He is particularly interested in developing effective and efficient data analysis techniques to resolve privacy issues in data-oriented applications.