



Minimal Criteria: Minimizing User Input and User Interface for Faster Output in Minimalistic Mobile Applications

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ABSTRACT

The principles of minimalist design are evident in much of the technology we use today. This is especially the case with mobile applications. The most successful of which attempt to minimize the amount of user input needed to provide users with the information they are seeking. Although many mobile applications use data gathered by in-system activity such as a GPS to minimize input from users—some systems require user input, such is the case with roommate matching. This study utilizes the RoomUP mobile application as a testbed to define minimal criteria that can be used to gather user input and produce a compatible roommate match. Participatory design with prospective student users is used to reduce the number of variables and provide recommendations for a minimalist user interface. The resulting prototype is then used to verify that it meets design goals and supports a satisfactory user experience.

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KEYWORDS

Minimalist Design; Roommate Matching;
Mobile Applications; Co-Design

INTRODUCTION

Minimalistic user interface design focuses on limiting the number of elements on the screen in an effort to reduce the cognitive ability required to complete a task (Babich, 2017). This design trend has been adapted by mobile application developers to ensure that only significant user interface elements make it onto a screen, leaving out all or any elements that are unused, or distract the user from initiating primary functions of the mobile application. For instance, Expedia's mobile user interface depicts its prime offerings; hotels, flights, cars, and bundle deals. After selecting an offering, it prompts the user for the destination, and dates. After inputting this information, the user interface outputs a list of all available options; rapidly presenting the output to the user. The focus has shifted from merely having a mobile presence to maintaining a user interface standard that induces users to quickly convert within the context of the application. Roommate matching is one context that remains unexplored.

Past literature reveals that roommate compatibility is essential for a satisfactory collegiate experience. Records indicate that cleanliness, noise levels, and sleeping habits may be related to roommate compatibility. However, there is a gap in research because the prescribed compatibility variables are not derived from an evidence-based research approach, nor applied to a streamlined process that results in a compatible roommate match. The purpose of this study is to leverage the principles of minimalistic design to develop a new feature in an existing mobile application that matches roommates with local housing called RoomUP. The purpose of this feature is to reduce the complexity that exists in the current roommate matching process. In order to accomplish this the researcher will first discover the variables students perceive to be related to roommate compatibility by way of focus group sessions. The discovered variables will be prioritized by significance and are denoted as a new design concept we call *Minimal Criteria*. The development of minimal criteria is the focus of a co-design session to develop the user interface for the RoomUP mobile application. Finally, the low fidelity user interface will be previewed through an evaluation survey that seeks to measure satisfaction with regard to the roommate preference intake questionnaire and how well it was integrated into the co-designed minimalist RoomUP user interface.

PROBLEM STATEMENT

The current roommate matching process elected by universities is not supported by research, and data is collected through paper-based forms. This makes it tedious, stressful and misleading. Prospective students spend hours gazing through the FAQ section, setting up dorm viewing ceremonies, and filling out bogus paper work; all for the promise of a compatible roommate who is sourced from randomness. Roommate compatibility studies conducted in the 1960's and 1970's focused on personality characteristics and cultural backgrounds resulting in outdated and vague findings. There was manifold of compatibility variables found, but these variables were derived from an assessment of historical roommate matching programs, and not by engaging student populations and their perspectives on an ideal roommate. The best minimal criteria still remains a mystery. Past

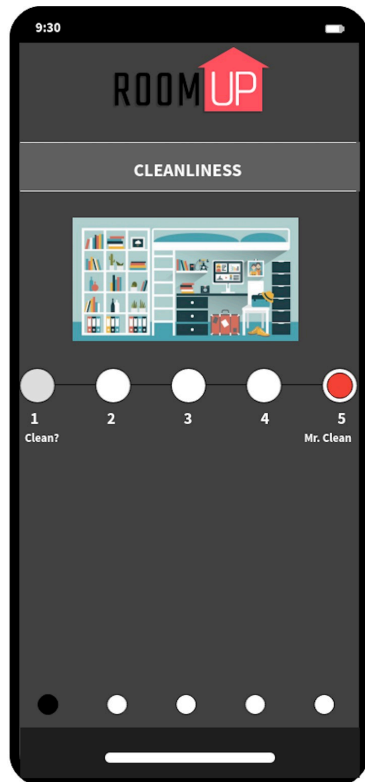


Figure 1: Cleanliness – Minimal Criteria

research neglected the idea of a re-designed roommate matching process through their findings and the lack of application leaves a wide gap in research. The medium of delivery for the current roommate matching process cavalierly ignores user intuitiveness, and user's needs. However, the present student population values fast decision making, and craves instant answers. Evaluation is a must for measuring the effectiveness and satisfaction of a process (Harrington, 1991), but signs of evaluation in past studies are faint. The study aims to tackle these gaps by first reducing the complexity that exists in the current roommate matching process. This can be achieved by identifying the minimal criteria and integrating it into a minimalistic user interface design. This will allow prospective users to input minimal data and receive faster output. The output can be used to make snap judgements. The minimal criteria along with the user interface will be put through an evaluation phase to ensure effectiveness, and student satisfaction. Ultimately these steps will reduce the cognitive overload, and greatly simplify the roommate matching process.

RESEARCH QUESTIONS

The following research questions have been identified to seal the gaps in current literature records:

- 1) When presented with variables identified in previous studies that are correlated with roommate compatibility, what do perspective RoomUP users believe best helps them indicate core preferences in a minimalist roommate preference intake questionnaire?
- 2) How can the user identified minimal criteria be integrated into a usable minimalist user interface such that it will minimize user input, and user interface to produce faster output?
- 3) Do students perceive the minimalist roommate preference intake questionnaires' variables, user interface, and experience as satisfactory?

METHODOLOGY

The RoomUP research study consisted of two research phases; phase one will be justified by way of focus group interviews. The objective of research phase one is to unearth the variables related to roommate compatibility and design the RoomUP user interface. The qualitative data collected in phase one will be analyzed using thematic analysis, which will be followed by a rank order activity that considers highly significant roommate compatibility variables. These variables will be used to establish the "Minimal Criteria". The researcher will then present the design aims of the RoomUP user interface for the participatory design segment of research phase one. Principles of minimalistic design will be leveraged to co-design the RoomUP user interface. Phase two will be justified through system evaluation. The objective of research phase two is to verify if the co-designed RoomUP user interface satisfied design goals and contributed to usability satisfaction. The System Usability Scale, and the SUPR-Q are two means of measuring usability satisfaction, experience, credibility, and design of a user interface (Birkett, 2016). A survey adapting these means of measurement combined with renderings of the RoomUP user interface will be dispatched to collect and satisfy the objective of research phase two. The mixed method data collection approach will allow the researcher to scale

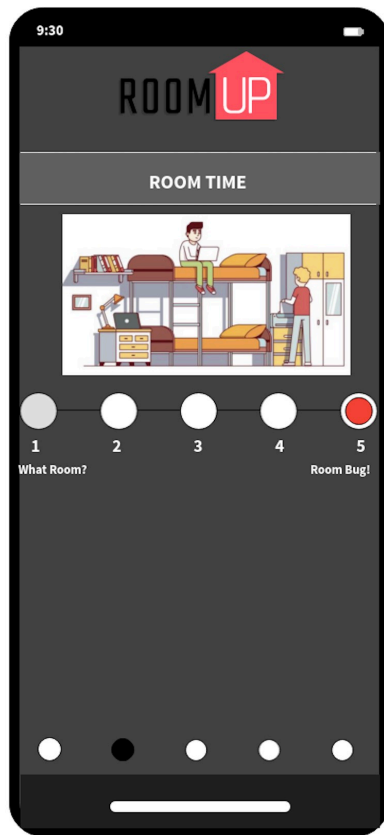


Figure 2: Room Time – Minimal Criteria

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the data collection time period. The researcher also believes that focus groups would be a good source of information due to the nature of the study. The objective of a focus group is to collect data in a social context where people can consider their own views, and views of others in a group setting (Breese, 2012). Interaction among participants can increase data quality because participants provide checks and balances on each other which can weed out false or extreme views (Creswell, 2009).

RESULTS AND DISCUSSION

Phase one of the RoomUP research study included two segments; focus group segment, and participatory design segment. Qualitative data was assessed by way of thematic analysis to identify patterns from the focus group sessions. This combined with the rank order activity established the minimal criteria variables for roommate compatibility as follows: 1) Cleanliness, 2) Room Time, 3) Noise Levels, 4) Sleep Time, and 5) Number of Visitors.

Minimalism and user intuitiveness were part of a re-occurring theme from the participatory design segment. Participants limited the minimal criteria to five variables and advocated for pictures to represent each variable (See *Figure 2*). Redundant mobile application elements were excluded to make the RoomUP user interface efficient. As an example, a button element that allowed the user to switch to the next question was omitted, so the user interface can dynamically perform this monotonous action upon selecting an answer (See *Figure 1*). The made the user interface responsive, satisfying a principle of minimalistic design. RoomUP was designed to emulate popular minimalistic mobile applications like Expedia, Uber, Snapchat, and Instagram. After an initial pilot of the RoomUP user interface, non-functional elements were excluded, and each existing element was verified to serve a critical purpose. The new lightweight user interface also contributed to a single focal point on the screen, satisfying yet another important principle of minimalistic design. All of these design choices allowed the user to swiftly complete the roommate preference intake questionnaire and rapidly bring to attention the output of compatible roommates. Results from the system evaluation survey confirmed that the newly designed RoomUP user interface reduces cognitive overload. 80% of participants stated that RoomUP was easy to use. 70% of participants strongly agreed to RoomUP bears a minimal and simple to follow user interface. 80% of participants found RoomUPs' user interface elements to serve a significant purpose, eliminate redundant, non-functional elements which ultimately made RoomUP easy to use. 100% of participants stated that the newly designed RoomUP user interface is a true reflection of the input from the co-design process, confirming the accuracy of the participatory design session.

CONCLUSION

This research proposed the minimal criteria by way of engaging student populations through an evidence based approach. Principles of minimalistic design were used in combination with the findings from the study to re-think the roommate matching process. These findings were refined by thematic analysis which led to the development of the roommate preference intake questionnaire,

and its integration into a minimalistic user interface. The system evaluation phase provided evidence to support this research attempt which seeks to minimize user input, user interface for faster output in a minimalistic mobile application. Future work in this area would entail a wide-scale deployment of this new feature to examine whether the function results in an increase of roommate satisfaction. The implication of this work is that students will be less likely to leave campus again given that the roommate compatibility is an influential factor in this decision (Anderson-Rowland, 1998; Lapidus, Green and Baruh, 1985).

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