

# Empirical Study

Group 6

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We perform a controlled experiment to collect and analyze user behavior; the entire process is called empirical research. In order to obtain data that is reliable which can take us to reliable conclusions. We have to follow a very systematic process, which consists of a series of stages in sequence as follows:

- Identification of research questions
- Determination of variables
- Design of experiment
- Analysis of empirical data

### ❖ Research Questions

Our first objective is to frame a testable research question from there; we frame the null hypothesis and alternative hypothesis, then we find statistical evidence to support the alternative hypothesis.

**RQ1.** How does the aesthetic score (on a scale of 1-5) depend on the types of objects on an interface?

**RQ2.** How does the aesthetic score (on a scale of 1-5) depend on the number of objects on an interface?

From this, we can frame two hypotheses:

**H<sub>0</sub>:** The Aesthetic score does not depend on the number, type, and layout of objects present in an interface.

**H<sub>1</sub>:** The Aesthetic score depends on the number, type, and layout of objects present in an interface.

The target of our empirical research is to find statistical evidence to nullify H<sub>0</sub> and support H<sub>1</sub>.

### ❖ Determination of Variables

Variables	Range of Variable
Aesthetic Score	(1-5)
Number of Objects	Positive Integer
Object Type	Text, Visual, Input or combination,
Interface Layout	Interface no. (1-6)

### **Scales for measurements:**

We use a nominal scale for rating types of objects and an interval scale for rating the number of objects.

1. Nominal Scale: We assign certain codes to a specific response like 5 to very good, 4 to good, 3 to average, 2 to bad, and 1 to very bad.
2. Interval Scale: We associate certain codes to specific ranges of data like 1 to more than 12, 2 for 10 - 12, 3 to 8 - 10, 4 to 6 - 8, 5 to less than 6.

Confounding variable:- Gender, as we are not aware of what gender of our users will be.

Note:- As the Users of our service are going to be participants and event hosts, then the age group that will be using our service will be concentrated in a range [18, 40].

### **❖ Design of Experiment**

#### **➤ Participant:**

- Quantity: to draw reliable conclusions, we gathered six participants.
- Profile: Participants from different profiles are gathered given our user base.

#### **➤ Task**

- Participants are presented with the different interfaces of the application and asked to rate them in the categories mentioned above.
- To avoid practice effect, we gave them tasks in random sequences.

## ❖ Analysis of Empirical Data

	I1	I2	I3	I4	I5	I6
P1	4	3	3	3	4	4
P2	3	4	2	4	4	3
P3	5	4	4	2	3	4
P4	3	3	1	3	4	3
P5	4	4	3	2	4	3
P6	3	3	2	4	3	3
Mean	3.67	3.50	2.50	3.00	3.67	3.33

Table 1: Rating based on number of objects present in an interface

Note: Interface 3 contains 12 objects, while interfaces 1 and 5 have 4 and 5 objects. Furthermore, the other interfaces include around 7 - 8 objects. Furthermore, we obtain a higher score when there are lesser objects on the interface.

	I1	I2	I3	I4	I5	I6
P1	3	3	3	3	4	2
P2	4	4	2	4	3	3
P3	4	3	4	2	2	2
P4	4	3	2	3	2	3
P5	3	4	3	2	3	3
P6	3	3	2	1	3	1
Mean	3.50	3.33	2.67	2.50	2.83	2.33

Table 2: Rating based on types of objects present in an interface

Note: Interfaces 4 and 6 are almost filled with text, while interfaces 1 and 2 have more visual content like images. The ratings are found proportional to the presence of visual content over textual or descriptive ones.