

# Milestone 3: Implementation and Evaluation

Team F

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# Evaluation of the implemented concepts

## Study design and study procedure

Participants navigated to the privacy setting page by pressing button images of our paper prototype. Member of our team briefed participants about the purpose of the study and asked them to confirm three processes. Subsequently, participants had an opportunity to ask any questions during the test.

We used within-subject design for experiment design structure as we have one condition, the results would not be biased due to learning effects.

The independent variable, dependent variable are follows:

- Independent variable: Input device
  - Conditions: Hand click to paper prototype vs Pen vs speak out
- Independent variable: User's age
  - Conditions: <19, 20-29, 30-39, 40-49, 50-59, 60+
- Independent variable: Gender
  - Conditions: Female vs Male
- Independent variable: Technological knowledge
  - Conditions: Degree
- Independent variable: Usage of variable fitness trackers
  - Conditions: Never used vs Experienced before vs Currently using

Dependent variables:

- Time taken
- Error rate
- Participants response in a given scenario/situation
- Feedback/suggestions

Our team has one condition which would benefit to users not to learn from different conditions. The condition was designed based on the following concepts:

- Visual image of personal activity of the user will impact the user to make chose
- Would receiving notification/messages from app to review choice of sharing location data have an impact on usability?
- Do participants believe location data as an impact on the privacy and security?

Therefore, our condition of experiment is providing visual image and giving alert messages to users in a certain situation.

In terms of baseline condition, it is essential to remind team goal of the entire study. Our testing for fitbit application was to identify the impact of geographical image when it comes to decide sharing location data, and secondly identifying the information quality that could inform users to understand. These questions are based on the information that current fitbit application produce to users. Our baseline condition is therefore about weak information. Specific baseline condition is stated below:

- Fitbit does not provide enough information before user make choice about sharing location data.

## Prototype

We used formative approach for usability testing. Formative approach focuses on how the user perceives an interface component rather than on how well the user completes a given task. [1]

## Participants

Basic questionnaires were given to participants before implementing prototype. This pre-test questions demonstrates common factors of our participants. The questionnaire are as follows:

- Age range (19 or under/ 20-29/ 30-39/ 40-49/ 50-59/ 60+)
- Occupation
- Gender
- Qualification level

Additional three questions about usage of similar apps were also taken. These pre-test questions illustrate that all of our participants were inside of 20-29 age range and finished bachelor degree or higher. Moreover, commonly all the participants did not currently use fitness trackers while most of the participants use other similar apps that shares their locational data. Our participants were consisting of 4 males and 2 females which could impact on accurate statistics however based on the pre-test questions, it is available to suppose all the participants has similar background of using fitness trackers or using apps, or even sharing personal location data.

In **Process 1**, participants are required to register the app with suggested device then navigate to privacy setting screen to choose sharing personal location data. During this step, assistant will provide enough information about current functions in fitbit application and implemented functions from our prototype.

In **Process 2**, participants were received a notification in alert message format, after a week pass from registration. Participants should view specific information that how user's location data had collected and could shared. After viewing geographical information, they could have additional chance to select choices about sharing data.

Finally in **Process 3**, participants were received another notification in alert message format, when the user's routine had changed. The assistant examines certain situation for participants to understand about what 'Routine changed' means. Users could view geographical data collections about new routine and could select choices for certain changed location.

Examine the prototype per participants were recorded in video and consequently got average time taken per processes and the initial decisions that participants had chosen.

Characteristics (Time)	Process 1: Registration	Process 2: View weekly data collection	Process 3: Routine changed
<b>Gender</b>			
- Male	3m 12s	1m 27s	59s
- Female	3m 17s	1m 30s	1m 9s
<b>Average time taken</b>	Approx. 3m	Approx. 1m 30s	Approx. 1m

Table 1: Participant demographics by time.

Participants	Process 1: Registration	Process 2: View weekly data collection	Process 3: Routine changed
Participant #1	Private	Sharing with friends	Sharing with friends
Participant #2	Private	Private	Private
Participant #3	Private	Sharing with friends	Sharing with friends
Participant #4	Sharing with friends	Sharing with friends	Sharing with friends
Participant #5	Private	Private	Sharing with friends
Participant #6	Private	Private	Sharing with friends
Overall percentage (%)	Private: 83% Sharing with friends: 17% Public: 0%	Private: 50% Sharing with friends: 50% Public: 0%	Private: 17% Sharing with friends: 83% Public: 0%

Table 2: Participants initial decision about sharing data

Table 1 and Table 2 shows the result of each processes. The average time for **process 1** was taken longest as it is required to register and decide initial privacy setting while **process 2** and **process 3** shows relatively short time. Gender, that could also identify in Table 1 does not show big difference in every process compare to the number of participants.

Table 2 illustrates the initial decision that participants selects when sharing personal location data. 5 of participants selects not sharing their data to others, while one decided to share with friends only. Contrastively after knowing how personal locational data is stored and shared based on users one-week data, half of the participants decided to share with friends and half left to be private. These decisions were changed again when user's routine changed. Participants were explained about occasional routine and the result showed complete difference with **process 1**.

### Questionnaire

Questionnaires	Has this prototype changed your understanding about location data?	Does sharing your location data has impact on your security?	Do you feel more informed about what sharing your location data reveals about your life/activity?
Participant #1	No	Yes	Yes
Participant #2	Yes	Yes	Yes
Participant #3	No	Yes	No
Participant #4	No	Yes	Yes
Participant #5	Yes	Yes	Yes
Participant #6	No	Yes	Yes
Overall Percentage (%)	Yes: 33% No: 67%	Yes: 100% No: 0%	Yes: 83% No: 17%

Table 3: Participants answering questionnaires about privacy.

Questionnaires	How easy did you find using this feature?	Do you think other people will learn to use this feature quickly?
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<b>Participant #1</b>	Easy	Yes
<b>Participant #2</b>	Easy	Yes
<b>Participant #3</b>	Very Easy	Yes
<b>Participant #4</b>	Easy	Yes
<b>Participant #5</b>	Very Easy	Yes
<b>Participant #6</b>	Very Easy	Yes
<b>Overall percentage (%)</b>	Very Easy: 50% Easy: 50% Difficult: 0% Very difficult: 0%	Yes: 100% No: 0%

Table 4: Participants answering questionnaires about usability.

*Table 3* and *Table 4* demonstrates the result of post-test questions based on privacy and usability. In terms of privacy, only 33 percent of participants replied their understanding about location data was changed however, question about feeling more informed when knowing sharing data reveals personal life or activity results 83 percent of positive answers. In usability questions, high learnability was detected.

### Feedbacks

Participants had provided both positive and negative feedbacks after testing our paper prototype. Mostly addressed that our prototype was easy and enjoyed however there were three common suggestions about both functionally and informatively. Firstly, functions that can allow sharing at specific times of the day or not sharing in a specific area. Secondly, provide length of time spent in an area also when providing information about how the location data stored and shared. Finally, when the user dismissed the alert message, provide reminder to review at later time. First two suggestions are based on the privacy perspective while the final suggestion was based on usability.

## Bibliography

1. Lazar, Jonathan, et al. "Usability Testing." Research Methods in Human Computer Interaction (Second Edition), Morgan Kaufmann, 5 May 2017.