PROJECT TITLE: DEFINING AND CONTROLLING LOCATION BASED PRIVACY SETTINGS ON FACEBOOK: A STUDY AND EVALUATION

Student Number: C1339296

Supervisor: Alia Abdelmoty

Moderator: George Theodorakopoulos

PROJECT DESCRIPTION

Location based data is increasingly being collected by a significant percentage of applications. There are two main types of location data that can be collected by applications, precise location and approximate location. Precise location is when applications retrieve the user's exact location using the Global Positioning System(GPS) or network location services such as cell towers and Wi-Fi. Approximate location is when applications retrieves the user's estimated location through the usage of location services such as cell towers and Wi-Fi. Today, 23% of all the applications in Google Play Store retrieve the precise location of the user (Olmstead and Atkinson,2015). Similarly, 21% of all applications in the Google Play Store retrieve the approximate location of the user. Today, Facebook is one of the most used applications amongst users of all age groups and backgrounds. However, in the past Facebook has raised a significant amount of privacy concerns among users.

This main aim of this project is to investigate the usability of Facebook with regards to the user's ability to define and control location-based privacy settings. In other words, the project will investigate the transparency of Facebook with regards to location data retrieved through the examination of permissions, privacy settings and feedback. Usability evaluation of permissions and privacy settings will be carried out and a study will be conducted on how both factors (transparency and usability) influences the overall control users have over their location data. The project will also investigate whether this overall level of control the application provides its users affect the perception of trust between the user and Facebook.

The Project will start by conducting a study of the policies, as described in terms and conditions of use, of Facebook when collecting location-based data. A study of the type of and granularity of location data collected by Facebook will also be carried out to gain an understanding of the data captured and how it may be used. This information will then be compared to the location based permission, privacy settings and feedback provided by the application in order to understand the extent of transparency provided by Facebook to its users. Usability evaluation will then be conducted on Facebook permissions and privacy settings. The results of the usability analysis and the evaluation of transparency will help determine the level of control the user has over the location based data on Facebook. Questionnaires and interviews will be considered as tools to gauge typical users' opinions and perspectives on the aspects of transparency, control and how both these factors affect the perception of trust.

PROJECT AIMS AND OBJECTIVES

1. **Analysis of the problem and the dimension of this project with the help of SSM tools.**
   Soft Systems Methodology(SSM) tools will be used to analyze the problem in detail and all the different dimensions of this project. This will help determine how to approach the problem in a focused and effective manner.

2. **Conduct research on Facebook and their policies in regards to capturing, storage and use of personal geographical location data.**
   The task will allow the understanding of the amount and type of location data Facebook collects from their users. Research will also be conducted to understand how Facebook uses the retrieved location based data.

3. **Investigate the privacy settings/permissions related to location on Facebook and evaluate whether these provide sufficient coverage of the different aspects of data access and control a user may wish to use in the application.**
   The underlying goal of this task is to understand how transparent Facebook is about the location data it collects. In other words, when a user sees Facebook's location based privacy settings, are they able to gain an accurate insight to what information may be retrieved. For example, when looking at the "precise location" permission, will users be able to understand what location data is collected and how this this data will be used? Interviews will be used to understand user opinions and perspectives on the transparency of permissions and privacy settings on it's own.

4. **Understand the quality of feedback presented by Facebook to users when location data retrieval settings are enabled. In addition, the project will also evaluate if the feedback provided by Facebook is a sufficient representation of the data actually retrieved by Facebook**
   Similar to the second objective mentioned above, this objective also attempts to understand the overall transparency of Facebook with regards to the feedback they provide when location based data settings are enabled. This objective investigates the quality of feedback provided by Facebook and if this feedback is an accurate reflection of the data collected by Facebook. This objective will also aim to understand the quality of feedback demanded by Facebook users. Interviews will be used to understand user opinions on current feedback presented by Facebook

5. **Investigate the level of overall control users have over the amount of location based retrieved by Facebook**
   Usability testing will be conducted on Facebook privacy settings and permissions. The usability test results and the evaluation of transparency described above in objectives two and three will determine the overall control Facebook users have over their location data being retrieved and used. Questionnaires based on Nielsen's heuristic principles

and think aloud style interviews will be used to test the usability of Facebook permissions and privacy settings.

6. **Understand the relationship between control and the user's perception of trust**
   This objective will study the relationship between the control provided by Facebook will affect the perception of trust among users. In order to successfully to complete this objective, it is important to define trust from a user's perspective. Interviews can be used to understand how and on what basis can users develop the perception of trust. Research, interviews and questionnaires will also be conducted to understand opinions on the relationship between trust and control.
7. **Outline features that can be implemented onto Facebook that enhances the transparency of and the control users can have over the location based data collected.**
   The project will finally outline processes and features that can be implemented onto Facebook in order to enhance the control users have over location based data. Guidelines will be specifically presented about how Facebook can improve their current location based data settings and permissions in order to enhance the usability of these processes.

WORK PLAN

Continuous Activities throughout the course of the project:

Task 1: Conduct research on work that has been carried out in this subject in order to deepen and extend my knowledge on this subject

Task 2: Schedule and progress regular meetings with supervisor

Week 1 - The Week Starting 25th January 2016

Task 2: Progress meeting with supervisor

Task 3: Develop a model of the problem using SSM tools.

Task 4: Initial Plan

1. Develop initial plan for the project
2. Develop a work plan

Deliverables: Initial Plan Report

Week 2 - The Week Starting 1st February 2016

Task 5: Background Research and Evaluation

1. Conduct research on the terms and conditions of location based data collection and used of Facebook
2. Conduct research to understand what location data is collected by Facebook and how this data may be used. Specifically, also understand who else can access this data (for example, third-party organizations for advertising)
3. Evaluate Facebook's current privacy settings and permissions related to the geographical location data captured, stored and used
4. Evaluate Facebook's current level of feedback presented when the location based privacy settings are enabled. Develop a report on the findings from the evaluation
5. Develop a literature report on the findings from the research and evaluation conducted above.

Deliverables: Literature report based on background research and evaluation

Week 3 - The Week Stating 8th February 2016

Task 2: Progress meeting with supervisor

Task 6: First Interview

1. Design an interview based of initial user opinions on transparency
   - Questions will be developed to understand user opinions and perspectives on the current level of transparency of Facebook.
   - Users will then be asked about the impression of the data retrieved is gained from looking through Facebook permissions, privacy settings and the feedback provided by Facebook when the location based privacy settings are enabled.
   - Users will be questioned upon whether they are satisfied with the current quality of feedback provided by Facebook and how it may be improved.
   - Lastly, users will be asked for opinions on transparency and how this influences the control they have over location data
   - The interview will be conducted on a set of four to five individuals across different backgrounds and age groups
   - Write up results from the interview

Task 7: First Questionnaire

1. Design and develop a questionnaire for which the aim to develop understanding on the usability of current Facebook location based privacy settings and permissions
   - The questions in the questionnaire will be based upon Nielsen's heuristic principles on usability analysis
   - Users will be asked to state their opinions on how the usability of permissions and privacy settings of Facebook influences the control the they have over what location data is collected and used
   - Users will also be asked to present opinions on how privacy settings and permissions can be modified in order to improve its usability
2. Pilot first questionnaire by distributing it to four or five Facebook users of different backgrounds and expertise.

Deliverables:

1. *Write up results from the first set of interviews*
2. *Design and send out first questionnaire*

Week 4 - The week starting 15th February

Task 7: First Questionnaire

1. Await results from the first questionnaire

Task 8: Final Report

1. Work on writing up the initial aspects of the final report including introduction and add the background research conducted earlier.

Task 9: Second Interview and Think Aloud Testing

1. Conduct think aloud tests of selected Facebook users to further develop the understanding of the the usability of location based privacy settings and permissions on Facebook.
2. Conduct interviews on the same group on the basis of the questions stated in the second questionnaire
3. The think aloud tests will be conducted on 3 – 4 individuals across different backgrounds. Similarly, the interview will be conducted on a set of 4 – 5 individuals across different backgrounds and age groups.
4. Write up the results from think aloud tests and the additional interviews conducted.

Deliverables: Write up results from second sets of interviews

Week 5 - The week starting 22nd February

Task 2: Progress meeting with supervisor

Task 7: First Questionnaire

1. Collect results from second questionnaire and write up the results

Task 8: Final Report

1. Continue making progress on the final report. Write up a section on implementation

Deliverables: Write up results from the first questionnaire

Week 6 – The Week Starting 29th February

Task 8: Final Report

1. Review the report progress and make alterations

Task 10: Second Questionnaire

1. Design second questionnaire for which the main aim is to understand user opinions about the relationship between control and trust
    - Questions will be based what users believe trust between an application and its users and how users choose to convey the factor of trust towards an application
    - Questions will also also aim to understand how control influences the perception of trust towards an application
2. Pilot second questionnaire by distributing it to four or five Facebook users of different backgrounds and expertise.

Deliverables: Design and send out the second questionnaire

Week 7- The Week Starting 7th March

Task 2: Progress meeting with the supervisor

Task 10: Second Questionnaire

1. Await results from the second questionnaire.

Task 11: Third interview

1. Conduct interview with four or five individuals based on the same questions formulated in the second questionnaire
2. Write up the results from the interview

Deliverables: Write up results from the third sets of interviews

Week 8 - Week Starting 14th March

Task 2: Progress meeting with supervisor

Task 10: Second Questionnaire

1. Collect and write up results from the second questionnaire.

Deliverables: Write up results from the second questionnaire

Easter Recess- Start 19th March and Finish 10th April

Task 8: Final Report

1. Finish writing up the analysis, evaluation and comparisons of results from all questionnaires and interviews.
2. Finish Conclusion, Scope for future research and reflection of learning outcomes from this project
3. Finish first draft of the final report and send it to the supervisor for feedback

Deliverables: First draft of the final report

Week 9- Week Starting 11th April

Task 2: Progress meeting with the supervisor

Task 8: Final Report

1. Reflect on feedback from supervisor and make necessary modifications.

Week 10: Week Starting 18th April

Task 8: Final Report

1. Proof read the report and make necessary changes

Week 11- Week Starting 25th April

Task 2: Progress meetings with the supervisor

Task 8: Final Report

1. Finish up final draft of the final report
2. Request final feedback from supervisor
3. Make any changes/modifications as suggested by the supervisor

Week 12- Week Starting 2nd May

Task 8: Final Report

1. Proof read final report
2. Submit Final Report

Deliverables: Submission of final report

AN OVERVIEW TABLE OF KEY TASKS, DELIVERABLES AND DEADLINES

Week 1	Week 2	Week 3	Week 4
• Supervisor Meeting • Submit Initial Plan Report **31/1/2016 – Initial Plan Deadline**	Write up Literature Report about Background Research	• Supervisor Meeting • Write up Results from First Interview. • Design and Send Out First Questionnaire	Write up Results from the Second Sets of Interviews and think aloud tests
Week 5	**Week 6**	**Week 7**	**Week 8**
• Supervisor Meeting • Write up Results from the First Questionnaire	Send out Second Questionnaire	• Supervisor Meeting • Write up Results from the Third Sets of Interviews	• Supervisor Meeting • Write up Results from the Second Questionnaire
Easter Recess First Draft of Final Report	**Week 9** • Supervisor Meeting • Work on Final Report	**Week 10** Work on Final Report	**Week 11** • Supervisor Meeting • Work on Final Report
Week 12 Submit Final Report **6/5/2016 – Final Report Deadline**			

Reference List

1. Omstead,K and Atkinson,M.(2015). *Apps Permissions in the Google Play Store*. Pew Research Centre.