CARDIFF SCHOOL OF COMPUTER SCIENCE AND INFORMATICS

CM3203 ONE SEMESTER INDIVIDUAL PROJECT

TITLE: DEFINING AND CONTROLLING LOCATION BASED DATA ON FACEBOOK: A STUDY AND EVALUATION

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Abstract

The use of social networks has risen dramatically since they were first introduced. Today, people rely on social networking applications like Facebook to connect and communicate with other individuals. Facebook allows millions of individuals worldwide and create provisions for them to share various kinds of personal information like their location data. The implications of over sharing a user's location data can be dangerous. Therefore, it is important for users to exercise appropriate control over their location data captured and used on Facebook. This project aims to study the current level of control provided by Facebook and provide recommendations regarding how this level of control can be improved.

The two identified factors that influence the level of control provided to users over their location data were seen to be the transparency of location data capture policies displayed and the usability of location-enabled features and control measures. There will be in-depth analysis conducted on the overall transparency displayed by and the usability of Facebook's location enabled features and control measures. The in-depth analysis will be conducted using usability testing, interviews and questionnaires. The interviews and questionnaires will study user perceptions and thoughts on the factors mentioned above

While Facebook fared well when the usability of its location enabled features and control measures were tested, the organisation did not fare very well when the overall transparency displayed was evaluated. Similarly, apart from the two factors outlined above, the user's need to keep themselves aware of Facebook's data policies was seen to be another major factor that influences the overall level of control users exert over their location data captured and used.

Acknowledgements

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1.Introduction

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, 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 (Olmstead and Atkinson,2015).. Approximate location is when applications retrieves the user's estimated location through the usage of location services such as cell towers and Wi-Fi Olmstead and Atkinson,2015).. 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. 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.

The main aim of this project is to investigate the level of control provided by Facebook over user location data captured, shared and used. Factors that influence overall level of control such as transparency of location data captured displayed and usability of Facebook's location-enabled features and control measures (privacy settings, control settings) will be studied. Usability testing, interviews and questionnaires will be used to study user perceptions on those subjects.

The project will start by conducting a study of the policies, as described in terms and conditions of use. 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.

2.Approach

This project aims to gain an understanding regarding how user control over location data captured by Facebook can be improved. This subject can be significantly complicated and hard to systematically define. Therefore, the soft systems methodology will be used to provide a structured framework to problems and activities defined within this subject.

Soft Systems Methodology

Formulating a root definition is the first task in the soft systems methodology approach. A root definition is a structured definition of the problem and the activities identified to solve this problem. A CATWOE analysis will be first conducted in order to aid the formulation of the root definition.

CATWOE Analysis

Client	Facebook Users
Actor	Unspecified
Transformation	To improve the level of control Facebook users have over the location data captured and stored
Worldview	By improving transparency of location data captured and the usability of location enabled features and control measures
Owner	Facebook
Environment Constraints	without negatively impacting overall user satisfaction

Root Definition

A system owned by Facebook to ensure an improvement in the level of control over the location data captured and stored by improving the transparency of location data captured and improving the usability of location enabled features and control measures without negatively impacting overall user satisfaction

Conceptual Model

The final step in the Soft-Systems Methodology is to construct a conceptual model. The conceptual model is based on the earlier formulated root definition. The Conceptual model below (Figure 1) will explain all activities that will be performed to achieve all the constraints mentioned in the root definition above.

C.A

Take C.A to ensure the best methodology for improving control is found

C

Assess methodology for improving control of LD

Understand most efficient methodology for providing users with most control

By improving the level of transparency of LD captured

C.A

Take C.A to ensure best methodology is understood

C

Monitor activity to ensure the best methods to improve transparency are understood

Understand importance for providing control over LD

Identify the best method to improve the current level of transparency

Improve usability of location enabled features and control measures

Evaluate methods to improve current levels of transparency displayed

Monitor activity to ensure that the best methodology to improve usability are found

C.A

Take C.A to ensure the best methodology to improve usability are formulated

Identify limitations in the current level of transparency displayed

C

Understand the best methodology to improve the usability of features and control measures

Examine the current level of Transparency displayed

Identify limitations in the usability of features and control measures

Assess current location-enabled features and all location enabled control measures

Evaluate elements of FB that are related to LD capture/sharing

Test the usability of features and control measures

Evaluate and research FB data policies and terms of use

C.A

Assess elements of LD capture and sharing that keep users satisfied

Take C.A to ensure current levels of user satisfaction are maintained

C

Figure 1.0

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3.Beneficiaries from and Outcomes of this Project

Beneficiaries

This Project can benefit the following groups of individuals

1. Existing Facebook users or potential Facebook users who wish to understand location based privacy concerns associated with Facebook. This project will conduct an in-depth analysis of the location data captured, stored and used by Facebook. Users who are concerned with privacy in regards to their location data should be able find key information in this project.
2. Researchers who wants to gain a perceptive on the current level of control provided over location data on Facebook and the factors that can influence the level of control provided.
3. Facebook developers who wish to improve user experience with Facebook with respect to the privacy concerns of location data.
4. Data researchers who specifically want to gain an understanding of user opinions and privacy concerns in regards to location data retrieval and usage.

Outcomes

This project hopes to gain a detailed understanding towards the current level of control over location data provided by Facebook and investigate the factors that can influence the level of control provided. User perceptions and recommendations on this subject will be studied with the help of interviews and questionnaires. These user perceptions will also be used to provide recommendations as to how Facebook can improve the current level of control provided over location data. All statements, theories and recommendations made in this project will be supported with concrete research conducted on the subject.

4.Background Research

Facebook is a corporation and a social networking service. Facebook has allowed the possibility of instantaneous communication, allowing users to connect and communicate with anyone else on Facebook. In addition, Facebook is also used by businesses to advertise, recruit new employees and maintain partnerships. As of now, Facebook is the most popular social networking service with over 1.09 billion active users (Facebook Newsroom, 2016). It was seen that as of 2014 82% of online young adults (ages 18 – 29) use Facebook (PewResearchCentre, 2015). Similarly, 79% of individuals aged between 30 and 49 have Facebook accounts and 64% of individuals aged between 50 and 64 operate active Facebook accounts (PewResearchCentre, 2015). However, the downside bought by the immense popularity of Facebook are the privacy concerns and personal security threats associated with the organisation.

Related Statistics of Facebook Users: Privacy Threats and Issues

Over the years, there have been a significant number of reports of crimes associated with Facebook. For instance, a crime linked to Facebook is reported every 40 minutes (Daily Mail, 2015). Crime investigations where Facebook was referenced included murder, rape, child sex offences, assault, kidnap, death threats, witness intimidation and fraud (Daily Mail, 2015).

In addition, complaints about alleged crimes linked to the use of Facebook and Twitter have said to increase by 780% in the last four years (The Guardian, 2015). There are various reasons why crimes committed with the help of Facebook is seen to be increasing drastically. One of them could be because of Facebook creating accessible and convenient provisions that allow users to share data of very personal nature such as their location data. Most users share their personal data without worrying about any negative repercussions where this data of personal nature can be misused in various ways. For instance, Queensland Detective Superintendent Brian Hay stated that "The more you put out there, the more you put a target on your own back" (Chamberlin, 2012). The consequences of these crimes can be very dangerous. Therefore, it is very important for social media organizations such as Facebook to keep users informed on their data retrieval and use policies. Users need to be aware of specifics of their data being retrieved and how this data can be used. This will allow users to be vigilant when making decisions regarding sharing their personal data on their online profiles.

Most common of crimes that have been associated with Facebook

As mentioned above, Facebook has been associated with crimes of dangerous consequences. The most common of crimes associated with Facebook are reported to be: -

1. **Stalking**
   Cyberstalking is serious crime when the perpetrator constantly harasses an individual by sending them threats and messages (Pridmore,2015). It addition stalking can also be when an individual's behavioural patterns are watched upon closely without their consent(Pridmore,2015). Stalking can often lead to other crimes such as robberies and harassment. This crime can be especially conducted when users tend to overshare location data on their Facebook profiles. Experienced criminals can identify patterns in the location data shared by users and use it as a means to conduct dangerous crimes(Pridmore,2015).

2. **Robbery**
   As mentioned above, with a significant amount of personal information shared on Facebook (inclusive of location data), it is not difficult for criminals to understand behavioral patterns that indicate where someone lives, what do they do at specific times and what times they are likely to not be home. There has been evidence that criminals use such information to conduct robberies on targeted individuals (Andrews, 2012).

3. **Identity Theft**
   Users usually enter information of personal nature on Facebook without being aware of its potential consequences. This has made it very easy for criminals to steal user identities. Hackers have been known to hack into individuals emails and sometimes even be able to access their bank information (Meulen, 2011).

4. **Defamation**
   Hackers can also take control of other individuals Facebook accounts and conduct dangerous crimes using those accounts (Meulen, 2011). This leads to the possibility of innocent individuals being suspected for crimes they did not commit. Crimes of defamatory nature are becoming dangerously common and easy to commit (Meulen,2011).

5. **Harassment**
   Facebook has had countless cases of assault threats, general assault and sexual assault associated with the organisation. Offenders use platforms such as Facebook to prey on unsuspecting victims (Andrews, 2012). Harassment can be a crime that can have very serious consequences.

Research and Analysis: Location Enabling on Facebook

An analysis of Facebook's location enabled features, its control measures, terms of use and data policies will be conducted and documented below.

Facebook Data Capture, Storage and Use Policies

This section of the report will outline a summary of Facebook's policies on capturing and using location data
Facebook operates a webpage which provides details on all data collected and used. Below will describe a general summary of the policies and the statements most relevant to the location data collected and used. A detailed explanation of Facebook's data collection and use policies can be found at: - https://www.facebook.com/full_data_use_policy

1. **"Things you do and information you provide"**
   This policy illustrates that Facebook collects the content and information provided by users when they use any of Facebook's services. This includes when a user posts a status with location data incorporated within it, when a user shares his location using instant messenger and when a user uploads a photo with location data incorporated within it.

2. **"Things others do and information they provide"**
   Similar to the policy mentioned above, Facebook also collects content and information other users share about other users. For example, Facebook also collects data on a particular user where his/her friends tag him in a post or photo with location data included in it.

3. **"Device Information"**
   Facebook collected information from computers, phones and all devices where their services are installed or accessed, depending on the permissions granted to them. For instance, Facebook collects users approximate and precise geographical device locations through GPS, Bluetooth and Wi-Fi signals.

4. "**Information from third party partners"**
   It is also stated that Facebook collects information from third party partners. In addition, Facebook also shares user specific information to these third party organisations. Facebook did not explicitly state the identity of these third party companies and how these companies use user information. However, after conducting further research on their policy pages it was understood that the majority of these third party organisations are advertising companies and hence use location based data for ad targeting purposes. Some of these companies are Acxiom, Datalogix and Episilon.

5. **"Facebook Companies"**
   Facebook also collects and stores information received from companies owned and operated by them. Instagram is an example of a company currently owned and operated by Facebook. Users can link their Facebook and Instagram accounts, and any location enabled post made on either accounts will be captured and stored.

Furthermore, below is a summary of how Facebook uses the data collected

1. **Provide improve and develop services**
   Location data collected from Facebook users is used to provide users with various location based services and functions. These services and functions will be explicitly described and evaluated in sections below.

2. **Show and measure ads and services**
   As mentioned above, Facebook shares location based information collected with third party organisations for ad targeting purposes. This policy can be especially concerning to individuals who are worried about privacy and security. Sharing data with external organisations will be discussed in detail below.

3. **Promote safety and security**
   Facebook makes use of user location data to make sure there are no wrongdoings (ex: hacking) occurring on an individual's account. For instance, if an individual's account was logged in from a distant and unlikely location or device, Facebook will activate appropriate security measures to ensure it is the user themselves logging onto the account. Users can choose to get notifications if their account is signed in from a previously unrecognizable device or location. Facebook also displays a list of all unfamiliar devices or locations and devices through the user recently logged onto their account. This list can be found on the security settings page. The user can click on end activity which will end the Facebook session on that particular device.
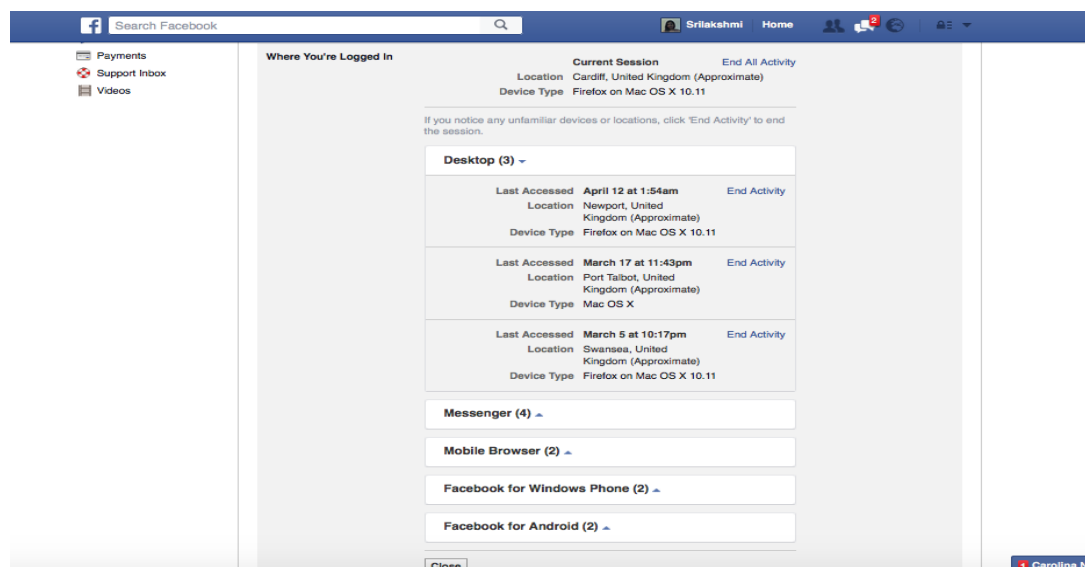

Figure 2.0 Unfamiliar devices or locations list

Above, are the policies of location capture, storage and use as stated by Facebook. However, there are still concerns about the extent to which Facebook retrieves location based information and if it is accurately displayed and stated by Facebook in their policy pages.

Facebook Location Based Features and Control Measures Analysis

This section of the report outlines the location enabled features of Facebook. The analysis is conducted on a MacBook Pro and on the web browser Mozilla Firefox. However, there are few location-enabled features that only available on certain portable devices, these analysis were conducted on those respective devices.

Location Enabled Status Posting

Users can often share their location through status posts. Users are presented a drop down list of locations they have shared in the past; however, they user can type in any location they wish to share. Nevertheless, the location will have to be present in Facebook's drop down list of locations
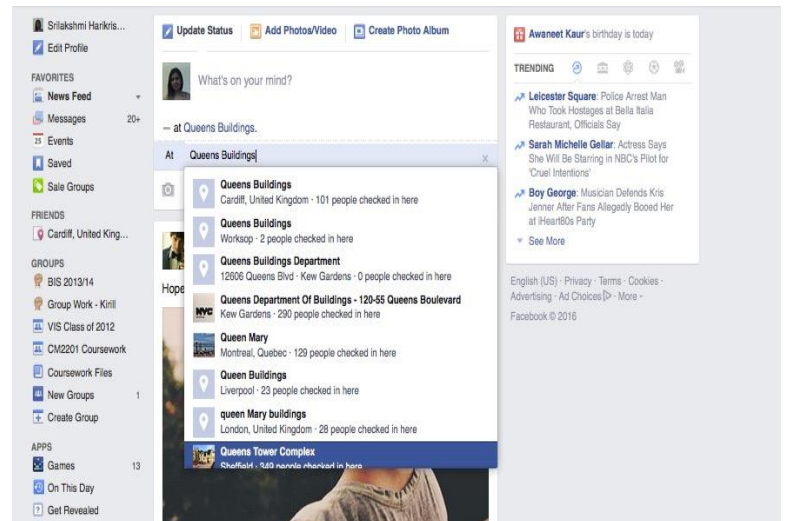

Figure 3.0 drop down menu of possible locations

When a new location is shared, users are presented with the option to save the location in the 'places' section of Facebook's 'saved' feature.
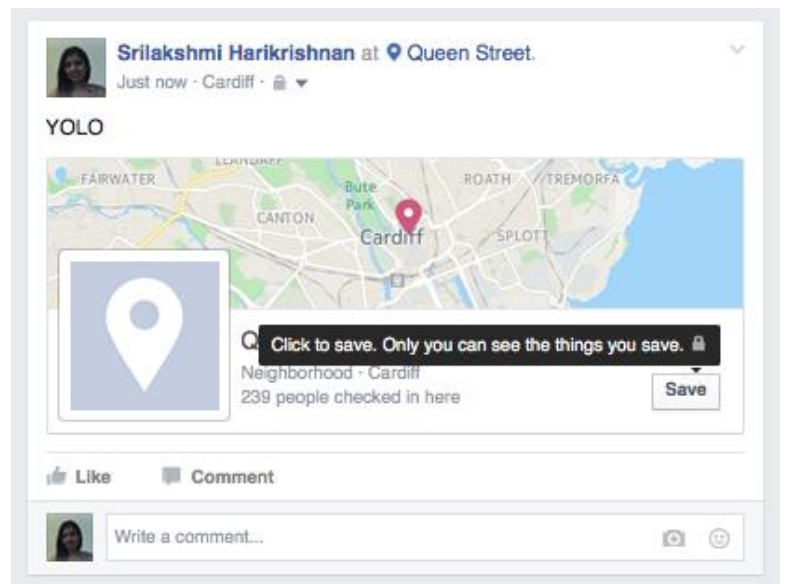

Figure 4.0 'Saved' feature

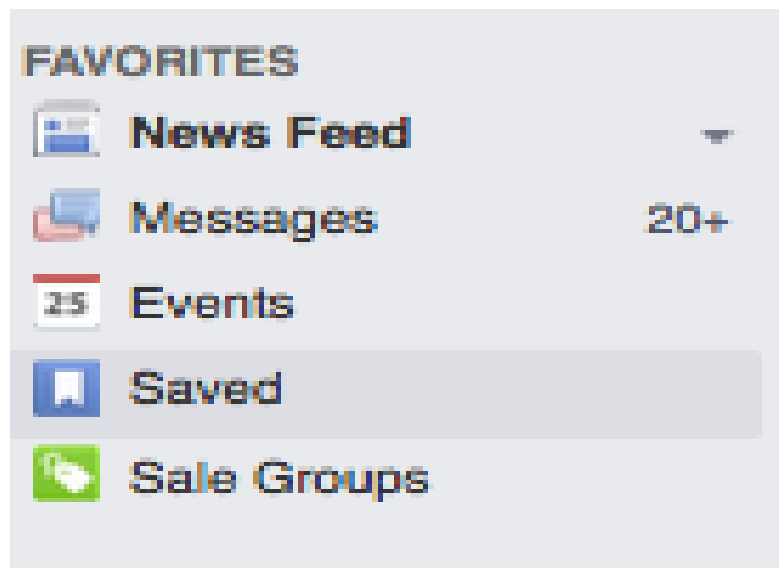The feature 'Saved' can be located at sidebar below the events feature

Figure 5.0 location of 'Saved' feature

Saved is a feature in Facebook where users can access any attribute such as photos, books, events and places previously saved. All locations saved can be viewed in 'places' section. Attributes saved under the saved feature is only viewable to user himself and not to other Facebook users
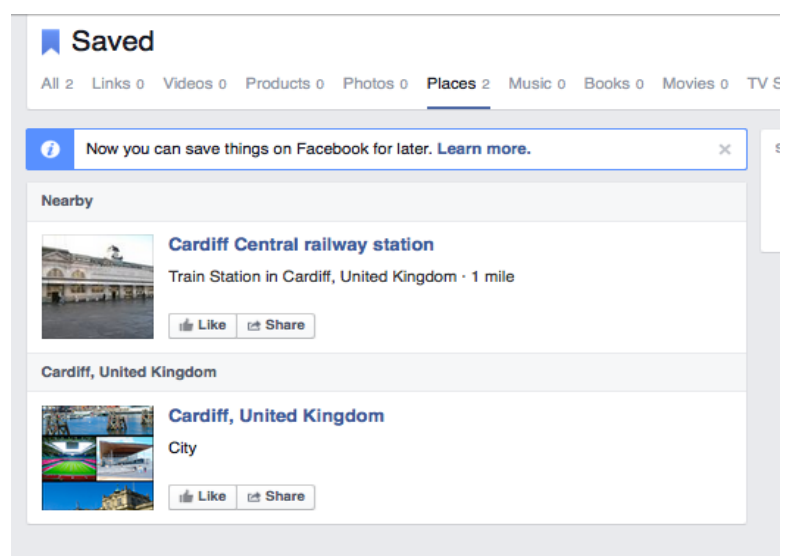

Figure 6.0 Description of the 'Saved' feature

Users do have the option to delete a saved
location, however this does require two
steps. The user can remove the location
from the places section. This moves that
particular location to the archives section

*Figure 7.0 deleting a location from
'Saved' feature*
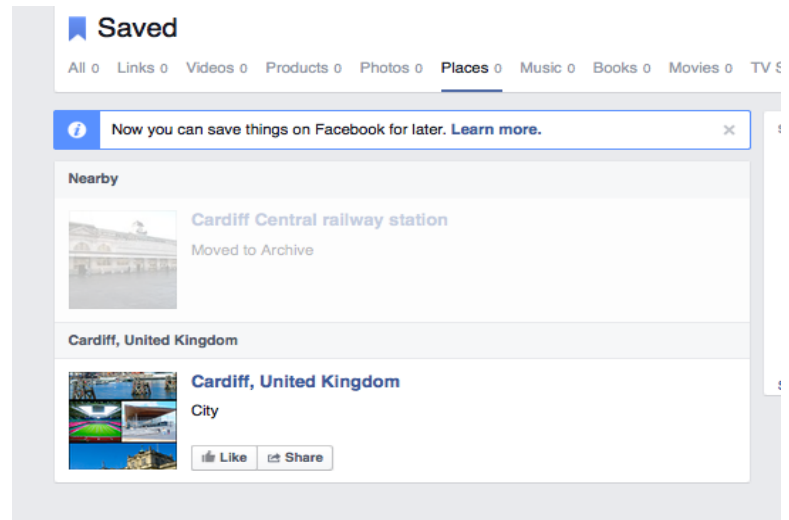
The user can then delete the location
from the archive section

Figure 8.0 Deleting location from 'Saved feature'

Location stored under the archive option
can be moved back to the places section
if desired

Figure 9.0 moving location back to places

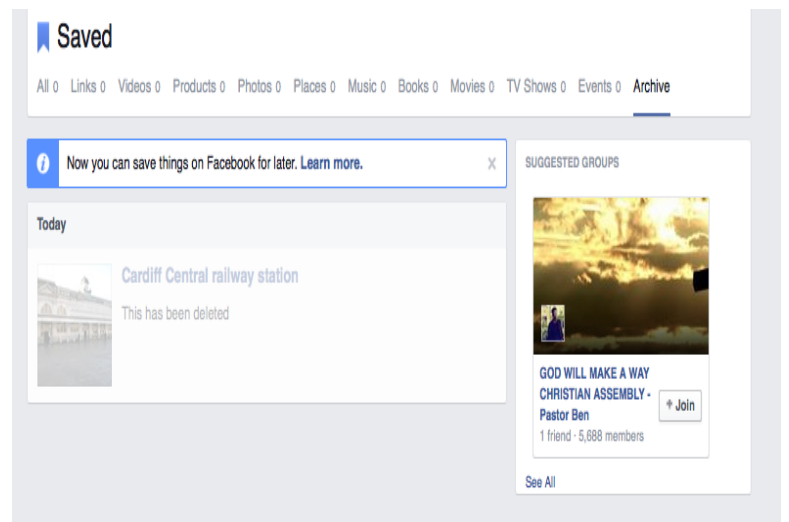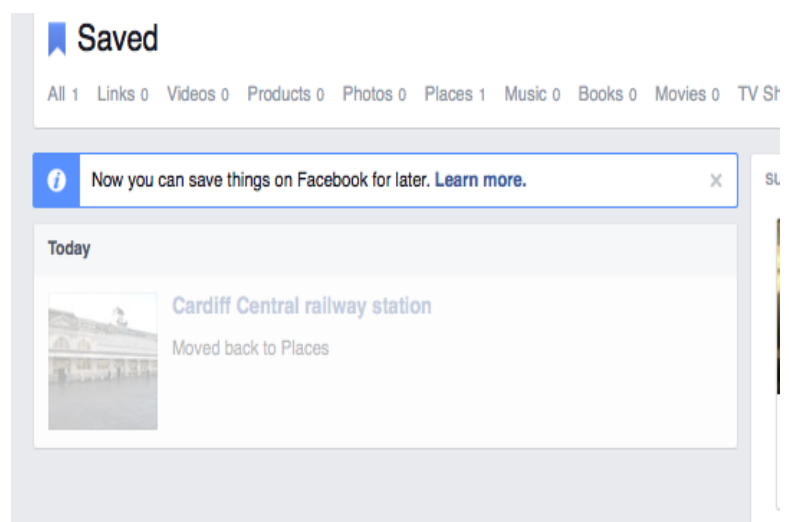Even though, other than the user himself nobody can view the locations saved in the 'Saved' feature, it is unclear to as if locations saved onto the 'Saved' feature can be shared with external organisations for advertisement purposes. Dating sharing to external organisations on Facebook will be discussed in more detail below.

Once a location enabled status post is shared, the location shared will be by default shared with any other posts made by the user in that session until the user disables location sharing or changes the location shared.

However, the user is presented with an option to change or disable the location from being shared during status updates. The user can disable location sharing by clicking on the cross icon next to location shared before posting a status update
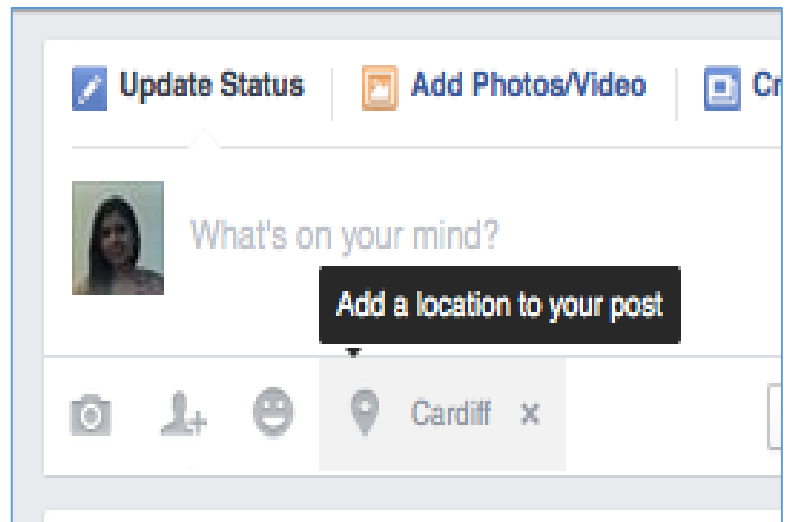
Figure 10.0 previously posed location saved by default

The user is also presented to option to remove the location shared from an already posted status. This can be achieved by accessing the 'edit post' option.
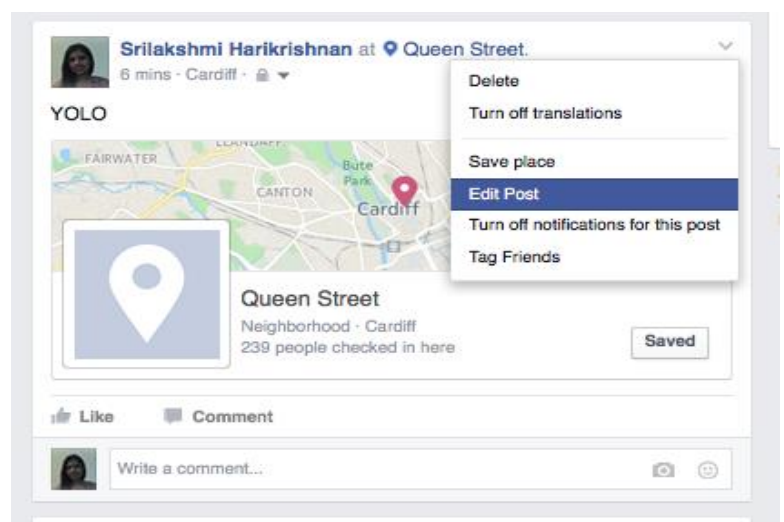
Figure 11.0 deleting location from status posts

A pop-up window will then be displayed where the user can disable the location to be shared by clicking on the cross icon located on the bottom far right.
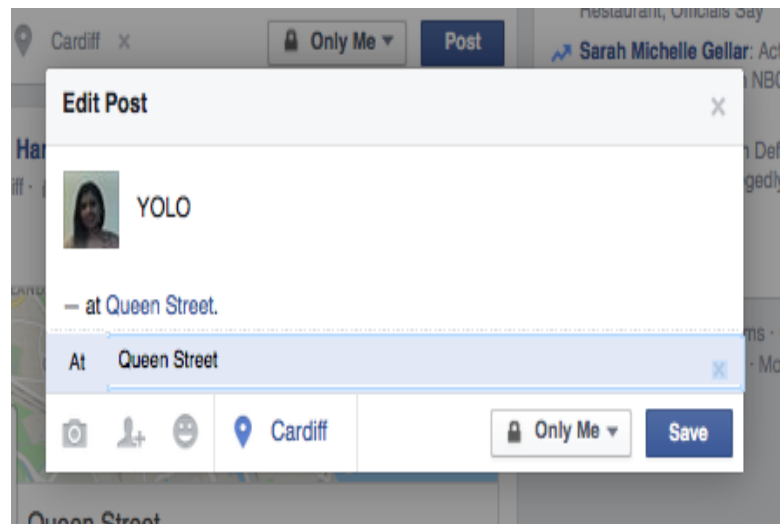
Figure 12.0 deleting location from status posts

Location Enabled Picture and Video Posts

Location can also be shared through any picture or video posts by the user.
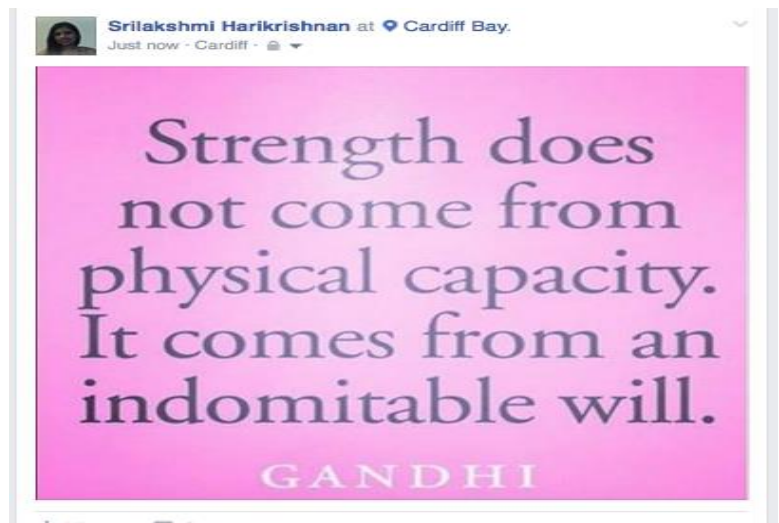
Figure 13.0 location enabled picture and video posts

The default location attribute also applies to picture and video location enabled posts. Just as mentioned above, if previous status post shared Cardiff as the location, any future picture video or will by default share Cardiff as the location unless the user changes the city shared or disables any location from being shared.

Check in Feature

Any location made through status posts, picture and video posts is stored in the check in feature. The 'checked in' location displayed in the check in feature consists of any locations shared by the user themselves or any location enabled posts they were tagged in.

Users can access the check-in feature by clicking on the 'More' in the profile page and choosing 'Check- Ins' from the drop-down menu.
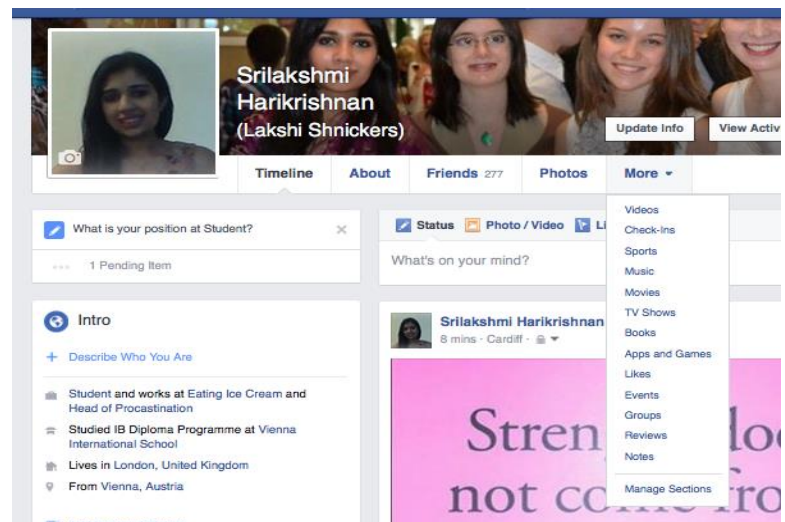
Figure 14.0 Check-in Feature

There are three sections in the Check-Ins Feature, 'Places', 'Cities' and 'Recent'. All location shared through status posts will be stored and viewable in all three sections

The 'Places' section demonstrates any specific places shared through location enabled posts made by the user or any location enabled posts they were tagged in. It also demonstrates the number of times the user has checked into this specific location
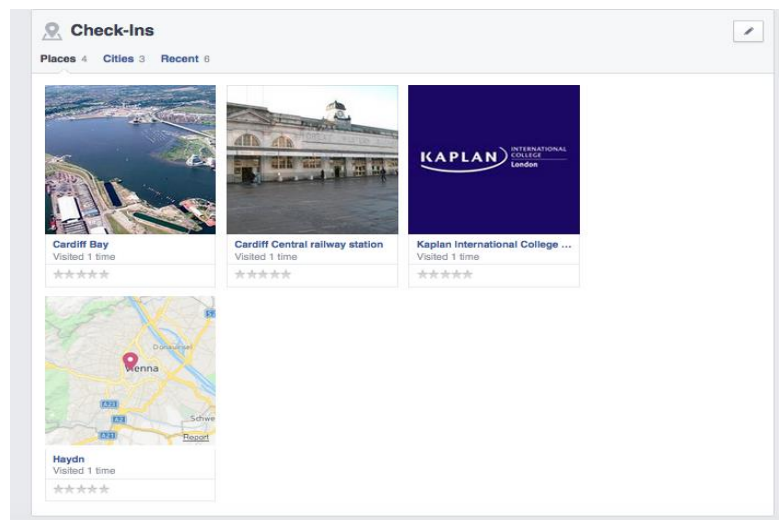
Figure 15.0 'Places' section, Check-In feature

The cities section of the report displays all the cities the user has checked into. This section of the check in feature can be significantly concerning. This is because, officially it is stated that my account has checked into three cities (Vienna, London and Cardiff) however on the map there have been various other cities marked. I have visited these cities over the last five years, however I have never personally shared or been tagged in any of these locations. Facebook does not explicitly specify where this information is retrieved from
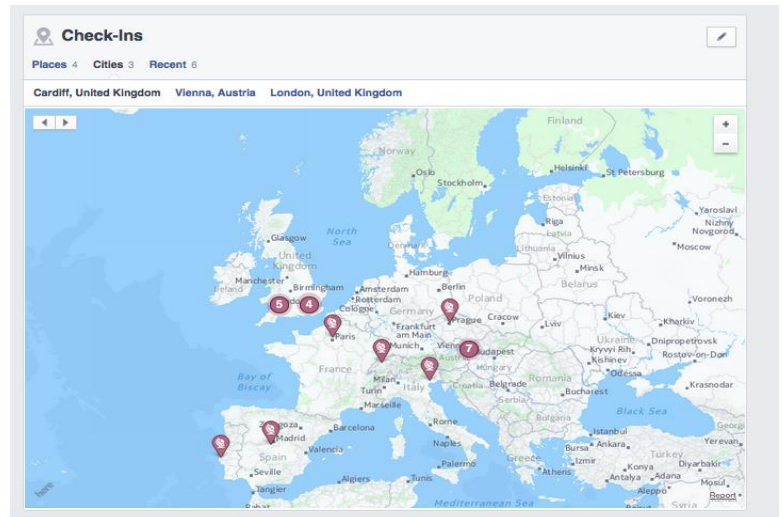
Figure 16.0 'Cities' section, Check-In feature

The 'recent' section outlines all locations that have been checked into and the dates that my account has checked into these places
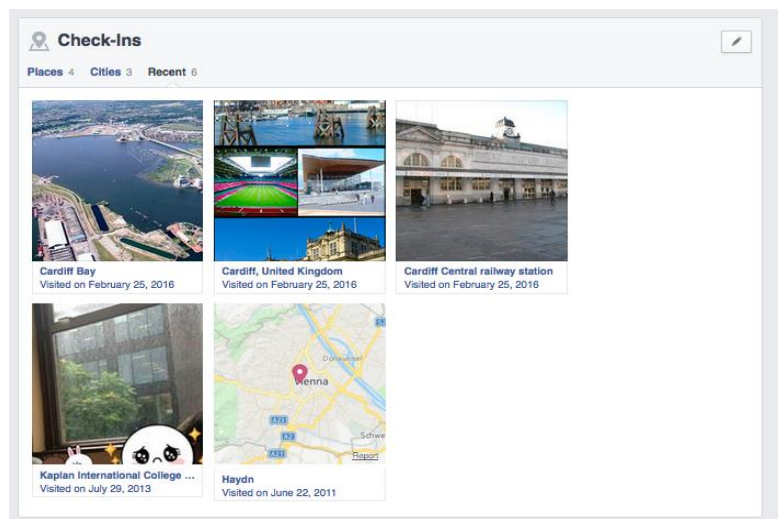
Figure 17.0 'Recent' section, Check-In feature

It is important to understand that the all the extra checked into cities marked in the 'cities' section has not been mentioned in the 'places' or 'recent' sections of the check in feature.

The check in feature can be hidden from the user's profile. This task can be completed by clicking on the manage icon located in the top right of the page.
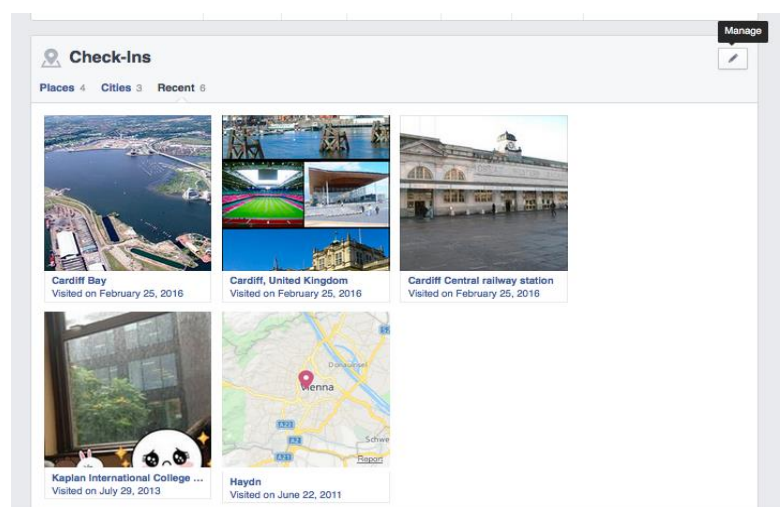
Figure 18.0 Hiding the Check-In Feature

In order to hide this feature from their profile, the user can then click on the 'hide section' option.
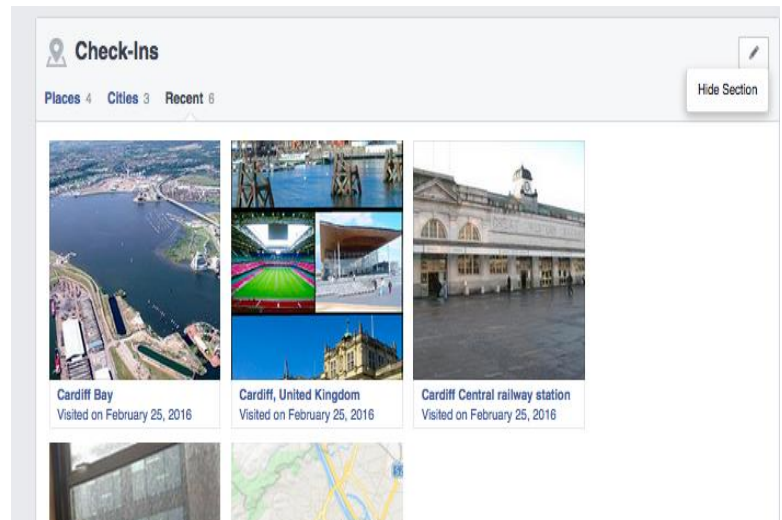
Figure 19.0 'Hiding the Check-In Feature

The user can make the check in feature visible by clicking on the 'manage sections' from drop-down menu when the more option is hovered upon.
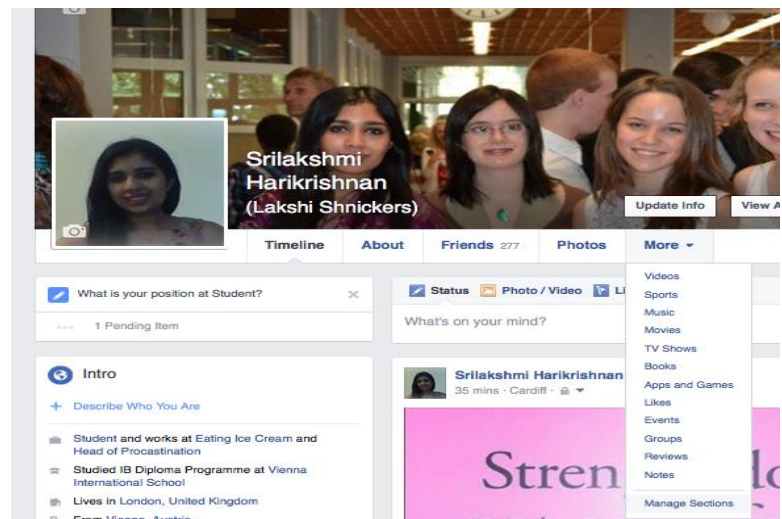
Figure 20.0 Making the Check-In Feature Visible

This will display a pop-up window with list of features, where the check in feature where the user can select the 'Check-ins' to make the feature visible again

By default, the check in feature is visible in the user's profile. However, user is presented with the option to hide this feature if desired.
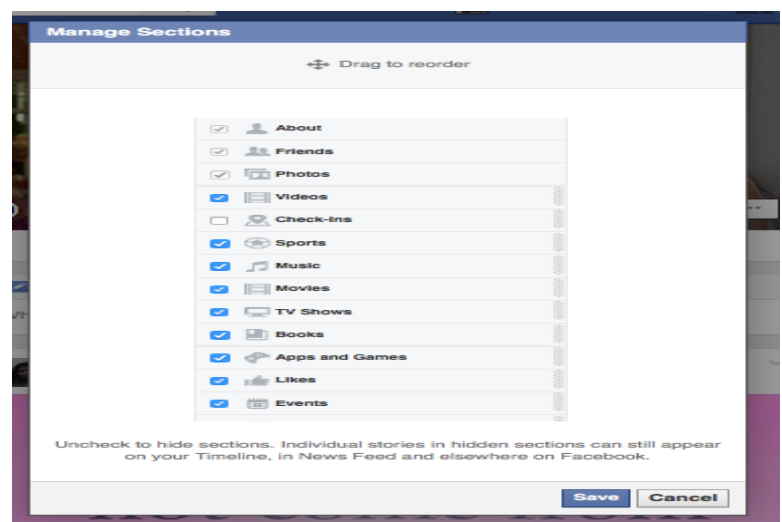
Figure 21.0 Making the Check-In Feature Visible

It is also important to note that if the user decides to remove the location from being shared in any of their posts, that particular instance of location check in will also be removed from the check in feature.

Location Sharing using Instant Messaging

Your precise location can be shared using instant messenger.
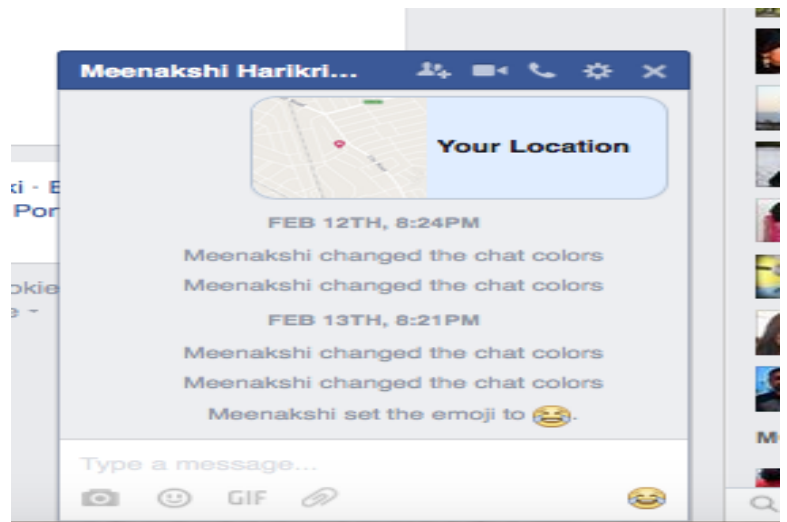
Figure 22.0 Precise Location Sharing on IM

Directions can then be gained towards the shared location.
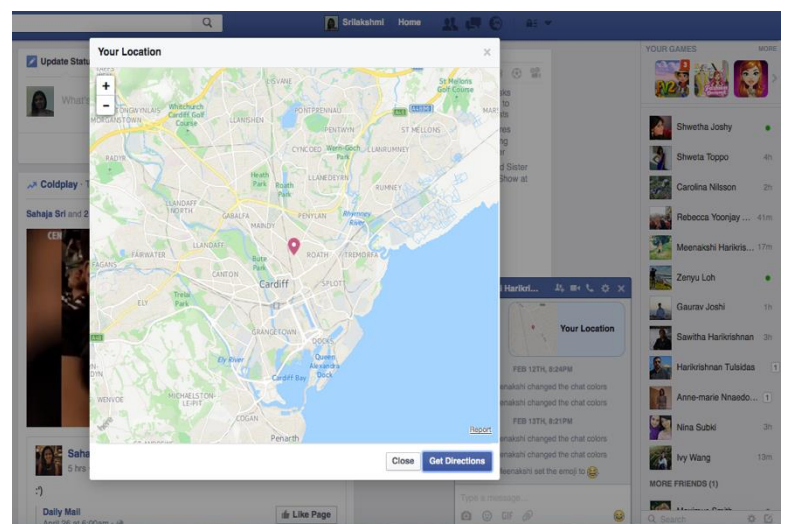
Figure 23.0 Directions to shared location on IM

Directions can be gained using any chosen location, even your current precise location.
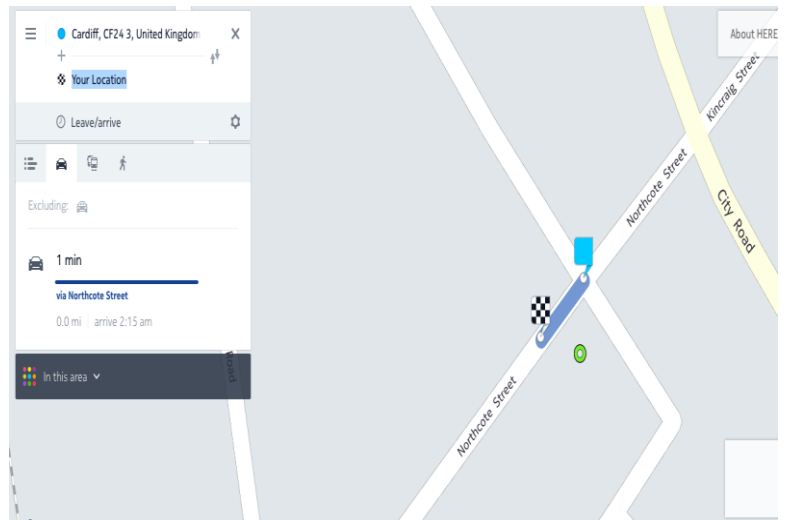
Figure 24.0 Directions based on current location

Similarly, when the current location option is chosen, a pop-up notification is bought up that requests permission to access your current precise location
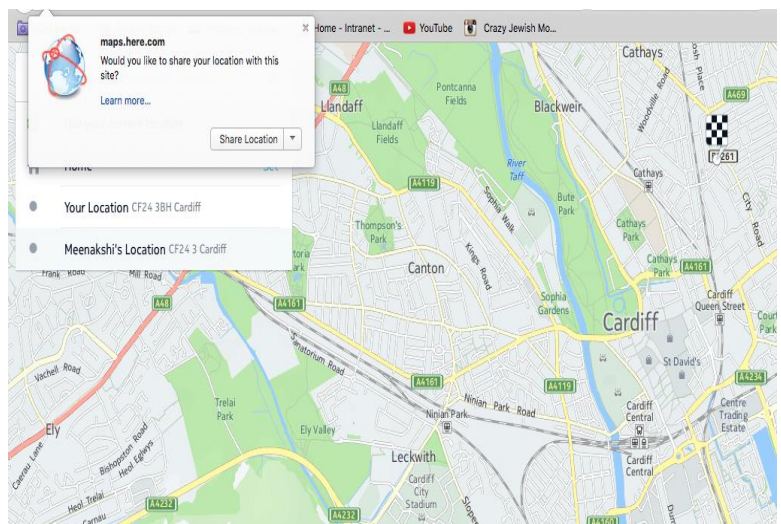
Figure 25.0 Pop-up notification on current location

The location-enabled features described above are of the most prominent and can be accessed by any device.

Current Facebook Location Based Permissions and Privacy Settings

Facebook Permissions

Permissions are terms the users needs to accept before installing the application on their mobile devices. Permissions are just brief statements on the hardware, software and information requirements for the application (Atkinson and Olmstead).

Facebook displays two location based permission statements, precise location and approximate location. These statements are very brief and an individual should be moderately knowledgeable with technology to accurately understand these statements.
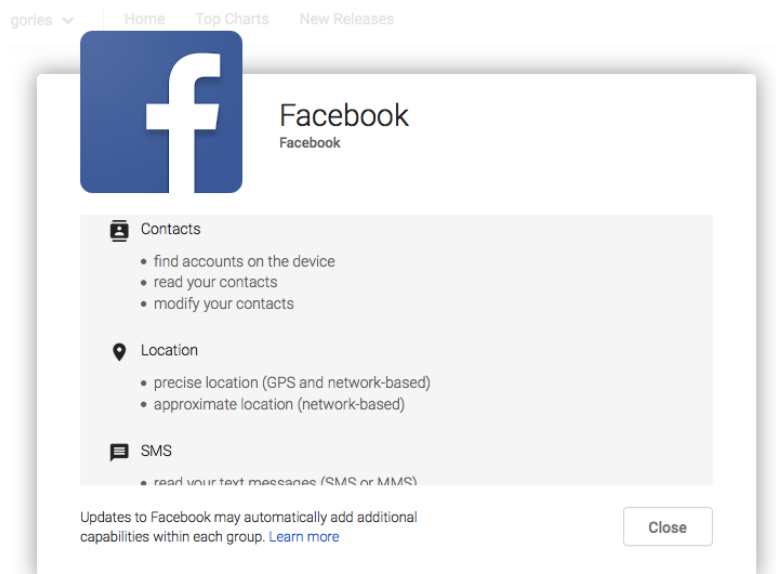
Figure 26.0 FB Permission Statements on Google Play

However, the permission statements do not mention how the already captured location may be used and with whom it may be shared. Users who access Facebook through the web are not provided with these statements. Personally, I believe that Facebook should briefly state how this captured information can be used and explicitly mention the data can be shared with third party organisations. In addition, users should be made aware about this information before creating an account with Facebook.

Location Services

Location services is a privacy setting that enables users to restrict or allow Facebook to access user's precise location data. The methodology for changing location services settings depends on the device used to access Facebook. On their help centre website, Facebook displays step by step descriptions regarding how to turn location services off. On my personal MacBook, Facebook does not have access to my precise location. Pop-up notifications that request permission is bought up every time Facebook attempts to access my precise location. On the other hand, location services are turned on by default on my android device.

Location services can be accessed in the settings menu option on my Samsung Tab 2.
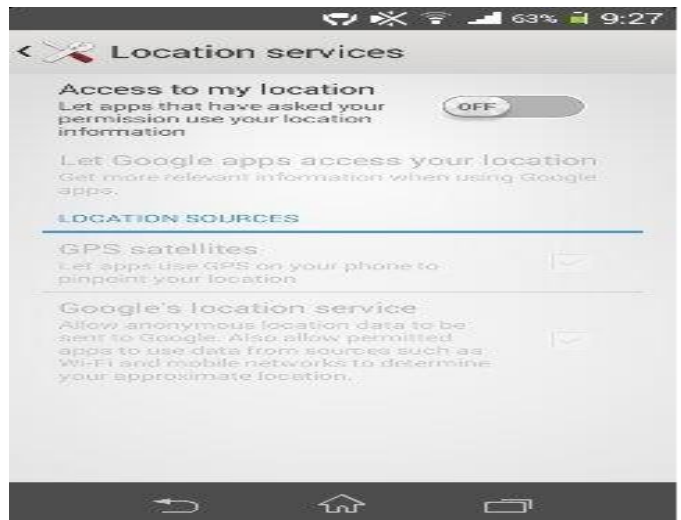
Figure 27.0 Location Services – Android Device

Data Sharing to External Organisations

Facebook shares user data with external organisations in a variety of ways. Facebook shares user data with any any game or external applications used within their accounts. For instance, games like Farmville and entourage can access users (who access these games) personal data. It is unclear as to what extent each organisation can access your personal information;
A major reason for sharing data with external organisations are for advertisement purposes. Facebook captures vital data from the user's profile such as their likes, place of residence and locations that checked into and this data is shared with organisation for advertisement purposes. Advertisement creators can use personal data as a means to target their audience. There are four options creators have when selecting an audience within a location. This information is gathered from Facebook's current stated policies on Ad Targeting. Information is taken from https://www.facebook.com/business/help/433385333434831

1. **Everyone in this location**: This includes all individuals who live in a select location ("current city" on their profile) and individuals who have had that location as their most recent, based on information from their mobile device.
2. **People who live in this location**: People who live in the selected location as stated under the user's "current city". This is also validated by IP address and aggregate information from user's friends stated profile locations.
3. **People recently in this location**: Individual's who's most recent location within the select area. This is determined from the information captured from the user's mobile device. This can include individuals who live there or who may be travelling there.
4. **People travelling in this location**: Individual whose most recent location is the selected area. This is also determined using the information captured from user's mobile devices where the desired location is and/or are greater than 125 miles from their home location.

The above criterion describes the scope of location-based ad targeting that is possible on Facebook. However, a personal opinion is that the information above is vague and is not perceived to be enough information on the subject of location-based ad targeting. For instance, there is not much information available on how users can control their location from being captured and shared. For instance, Facebook does state that "information from mobile devices can only be used from individuals who have their location services enabled".

However, there is no information regarding how users can control their location data that is already stored on Facebook from being shared.

Facebook also operates a section for information about Facebook Ads under the settings option. This section gives users the option to turn off internet based ads and manage Ad preferences. This section also does not provide users with a means or information regarding how to control what information of theirs is shared with advertisers.

Figure 28.0 Facebook Ad Section under privacy Settings

Conclusion on Analysis of Location-Enabled Features on Facebook

Facebook Location Enabled Features and Control Measures
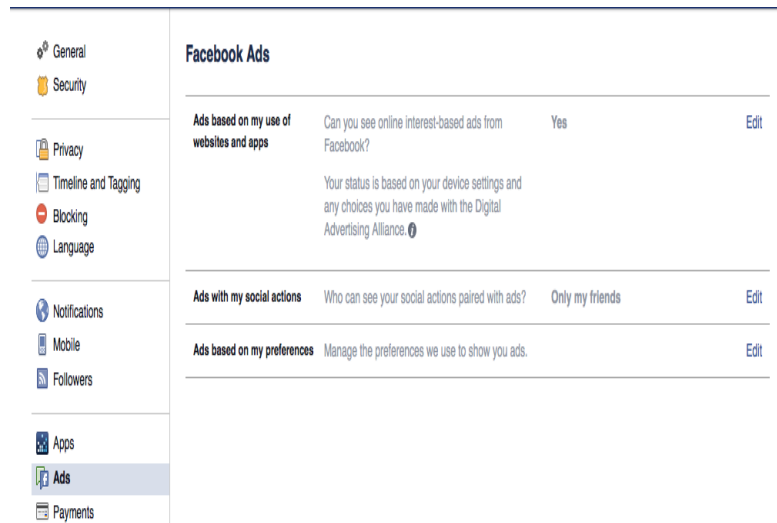All location enabled features documented above are understandable, easy to learn and relatively simple to use. Similarly, the control measures were also found to be equally accessible, easy to learn and use. The quality of immediate feedback provided when using location-enabled features was also seen to be satisfactory. However, I would have liked to see more specific control measures. This is especially in regard to to the location services setting. At the moment the location services setting is only said to control Facebook from accessing user's precise location. However, there should be privacy settings introduced that allows Facebook to restrict the sharing of approximate location and their stored location data to third party organisations.

Transparency

1. Detail of Data Policies and Location Tracking
Facebook makes some effort is being transparent about about how user data is captured, stored, used and shared. However, their web pages on their data policies is seen to be relatively general and not specific enough. In addition, Facebook should display more transparency regarding when an individual's current location is being tracked. Precise location tracking can be an area of concern for most users. This is because unless users turn their location services settings off, Facebook can track their current location. It is also important to note that the location services are always turned on by default. Therefore, Facebook should notify users when their precise location is being tracked using some form of immediate feedback mechanism (ex: pop-up notifications). This can enable information regarding location data capture to be more accessible to users. In addition, this can also enable users to be aware of when their location data is being captured. Similarly, Facebook also tracks user's approximate location using their IP address. Turning location services off does not seem to affect Facebook's ability of accessing a user's approximate location data.

2. Permission Statements and information for potential Facebook users
Their permission statements have been seen to be very brief. While the permission statements allow users who use Facebook on their smartphones to be aware to some of the extent of location data capture and use, it still does not provide an accurate illustration to how this data can be used. The terms mentioned in the location based permissions are "approximate" and "precise. These terms can be complicated for individuals who do not have a technological background or understanding. Some app stores display a brief explanation of the terms; however, the Google Play Store does not provide much of an explanation. Facebook should provide more specifics as to how user location data can be used on their permissions page. This will allow users who are downloading the Facebook application for the first time to understand what data of theirs can be collected and how this data can be used. It is also important to note that these permission statements are only accessible to individuals downloading the Facebook application onto their smartphones. At the moment Facebook does not display any information regarding location data towards new Facebook users who are creating accounts with them on a desktop setting.

3. Data Sharing to External Organisations

Facebook can share even the most basic of your location details such as hometown and current city to external organisations. Similarly, any location the user has checked into also has an equal risk of being shared with external organisation for advertisement and other purposes. Both approximate and precise location details of users can be tracked for advertising purposes. Turning location services off, allows users to be able to restrict their precise location from being tracked and shared to external organisations. However there currently do not seem to be a means to restricting approximate location data and stored location data to external organisations on Facebook.

5.Research Method: User Study

Background

The possible dangerous consequences of possible crimes associated with Facebook are especially a reason as to why users need to exert more control over their data shared on Facebook profiles. Two factors have been named to influence control, the transparency of location data capture policies and the usability of location enabled features and control measures. Being transparent regarding location data captured and used by Facebook can allow users to be have access to the information about their data and hence help them make decisions regarding how to control their data from being captured or used in means that they do not agree with. Furthermore, the usability of the location enabled features and the presence of appropriate control features will indicate the ease to users can control their location data being captured and used. If users find these control measures hard to identify and use, it will make it harder to control those aspects of Facebook's location data retrieval and usage. A user study in the form of questionnaires, interviews and usability testing will be conducted to evaluate Facebook in terms of transparency and usability.

Interviews and Usability Testing

To further evaluate the current level of transparency and usability of location enabled features displayed by Facebook a comprehensive user study (consisting of usability testing, interviews and questionnaires) was developed. This user study will attempt to study user perceptions regarding the transparency of location data Facebook displays and the usability of Facebook location enabled features and control measures. In addition, the interviews will also attempt to understand user perceptions about how both these factors can influence (transparency and usability) relate the extent of control users have over their location data captured and used. For an individual to be eligible for these interviews and usability testing, he/she must display these characteristics: -
1. He/she must be a presently active Facebook user for a minimum of two years. This is because in order to study user perceptions of transparency, usability and control the user should have minimum knowledge of Facebook, their features and their policies. In addition, testing the usability of features like the check in feature will require the user to have a significant amount of location information captured and stored.
2. An individual who is willing to cooperate to complete the tasks required for the interview and usability testing

User Study Design

		Descriptions	Approximate Time Taken
Stage 1		**Usability Testing:** Facebook location enabled features and control measures Method of Execution: Think Aloud Testing Method of Documentation: Screen recording and voice recording using Nokia Lumia 625	15 minutes
Stage 2		**Interviews:** Transparency, the usability and control of location enabled features Method of Execution: Interview Method of documentation: A recording using Nokia Lumia 625.	30 minutes

Stage 1: Usability Testing

Aim: To develop an understanding of the usability of Facebook location enabled applications and control measures through conducting a think aloud test of a well-defined set of tasks and subtasks which will be performed by the user.

Context of Usability Testing
Usability principles most relevant to the tasks to be completed will be identified. The usability of Facebook regarding their location enabled features and privacy settings will be assessed with the help of the results of think aloud testing, specifically using the identified usability principles

Usability Principles to be tested against
1. Visibility of System's Status
2. Match Between System and Real World
3. Consistency and Standards
4. Recognition rather than Recall
5. Aesthetic and Minimalistic Design

Think Aloud Setup
1. Interviewee will undergo a think aloud testing with their screen recorded using the Screen-o-Matic software. This will capture all user movements and clicks during the think aloud tests. The think aloud tests will be conducted on a Samsung Tab 2
2. The Audio will be recorded separately using Nokia Lumia 625

Tasks to be performed for the user

1. Location Enabled Posting and 'Saved' Feature
    1.1 Post location enabled status
    1.2 Save location posted to 'saved' feature
    1.3 Locate 'saved' feature and visit the places section
    1.4 Edit post in order to remove the location shared
    1.5 Understand if this also removes that particular location from the saved feature

1.6 Delete the location permanently from the saved feature

2. Location Posting and 'Check-In' Feature
    2.1 Post another location enabled status
    2.2 Visit check in feature in the profile page and identify the location shared in the places and recent section
    2.3 Edit the post in order to delete the location shared
    2.4 Identify if deleted location is still visible in the check in feature places and recent section
    2.5 Browse through cities section and identify the source of the highlighted cities checked in
    2.6 Hide Check in from profile
    2.7 Make check in visible again in profile

3. Location Sharing through Instant Messaging
    3.1 Share current location via instant messaging
    3.2 Get directions from current location to the location shared
    3.3 Identify and understand if location shared via instant messaging is stored in check -ins.

4. Disabling and Enabling Location Services
    4.1 Disable location services from settings on personal device
    4.2 Enable location services from settings on personal device

5. Permissions
    5.1 Retrieve location-based permissions from personal device.

Stage 2: User Interviews on Transparency, Usability and Control

Interview Aims and Objectives
1. To assess whether users appreciate the types, volume and accuracy of location data collected by Facebook in different contexts of using the application.
2. To gauge user understanding of the transparency displayed Facebook when collecting user location data with the use of permissions and feedback when location data is used.
3. To develop an understanding of how Facebook can display an improved level of transparency
4. To understand user opinions on the level of transparency provided can affect the level of control an individual has over the data collected by Facebook
5. To understand user opinions on the usability of location features
6. How Facebook can improve the usability of location features
7. To study user opinions on the quality of current location control measures available

Interview Context

Through this interview, I hope to develop an insight on the level of transparency displayed by Facebook regarding the location data captured through the use of feedback and permissions. Can users develop an accurate understanding of their location data captured when they view Facebook permissions and through the feedback provided when they use location enabled features? This interview also aims to outline user perceptions regarding how the transparency of location data captured can be improved. Furthermore, the user opinions on how the transparency of the location data captured related the extent of control users have over the location data captured will also be studied. Similarly, this interview also aims to gain an understanding to user thoughts on the overall usability of Facebook. Specifically, if users believe that all the location enabled features and control measures are easy to access, learn and use? In addition, if users are satisfied with the location services privacy settings presented.

Interview Outline

Introductory Questions
1. How old are you
   o 18 or younger
   o 19 – 25
   o 25 – 40
   o 40 – 55
   o Older than 55

2. How often do you use Facebook on a daily basis?
   o Less than 1 hour (infrequently)
   o 1 – 2 hours (moderately)
   o More than 2 hours (frequently)

3. On what platform are you more likely to use Facebook
   o IOS
   o Android
   o Microsoft Windows Phone
   o Web

4. Which of these location-enabled features have you used and you are aware about?
   o Location-enabled status and picture posting
   o 'Saved' feature
   o 'Check-in' feature
   o Location sharing through instant messaging
   o Nearby Friends
   o Nearby Places

Transparency Questions

1. Do you think Facebook is providing users (especially new users) with an accurate ground to understand what location based data can be collected and used?
   Reveal user opinions on the transparency displayed by Facebook towards new users (who are not familiar with Facebook) before they create an account or download the application.

2. Do you think Facebook should display more information enabling new/prospective Facebook users understand what location information is retrieved and how this information may be used?
   Reveal user opinions on if Facebook should be transparent about location data retrieval for new users who are unfamiliar with the organisation.

3. How do you think Facebook can improve their current means of informing new users about location data collection and usage? Please provide some suggestions
   Reveal user suggestions regarding how transparency of location data for perspective Facebook users can be improved

4. When using the location- enabled features during the usability testing, did you feel informed at all stages (like notifications when your current location is being tracked). On the whole would you say that you were satisfied with the quality of information provided through immediate feedback when using location enabled features on Facebook?
   Reveal user opinions on the quality of immediate feedback provided when using location enabled features during usability testing

5. In continuation to the above question, how can Facebook improve the quality of information provided through immediate feedback when using location-enabled features? Please provide some suggestions
   Reveal user opinions on how the current quality of feedback provided can be improved

6. Were you aware Facebook uses your information for location-based ads targeting. This is when Facebook shares your location based information with various advertising companies. When browsing through Facebook, were you able to pick up on this information?
   Find out if users are aware of location-based targeting and if they believe that they can accurately pick up on this information when browsing through Facebook.

7. Do you think Facebook should be more transparent about location-based ad targeting in an accessible manner and without users having to conduct additional in-depth research? If so, why?
   Reveal user opinions on if transparency of location-based ad targeting is important and if should be displayed within the Facebook's website or application.

8. Can you provide some suggestions regarding how Facebook can be transparent regarding location-based ad targeting?
   Reveal user suggestions on transparency of location-based ad targeting should be displayed

9. Do you think the amount of transparency of location data displayed by Facebook influences the level of control users have over the location data captured and used?
   Reveal user opinions on the relationship between the transparency of location data retrieval displayed by Facebook and the level of control users have over their location data being retrieved.

Usability Questions

10. On the whole what did you particularly like about the location enabled features and its control measures used during usability testing?
    Reveal what aspects about location-enabled features keeps users satisfied

11. Did you dislike or feel negatively about any aspects about these locations enabled features and their control features?
    Reveal what aspects about location-enabled features keeps users unsatisfied

12. During the usability testing, did you find it difficult to complete any of tasks? Why did you feel it was difficult?

13. Are you satisfied with current control measures when using location enabled features? Do you think users can appropriately control location data captured based on the control measures provided?

14. Are you satisfied with Facebook's current location services settings? What do you think turning this setting off controls?

15. How do you think turning location off will affect the location data that is being shared with third party organisations?

16. Facebook does not have any comprehensive privacy settings that allows user to control their location data being shared with third party organisations. What are your thoughts on this? Do you it is important for in this scenario control measures need to added?

17. On the basis of your opinions on the transparency of Facebook and the ease of use of location enabled features and their control measures, what is your opinion on the level of control Facebook provides their user's with

Results from User Study

General Summary of Results from User Study

This user study yielded interesting and valuable results in regards to location data capture and use. There were not many problems that arose when conducting the usability testing. Interviewees were able to complete most tasks with ease. Similarly, not many concerns were voiced in the follow up interview regarding usability testing. Facebook's location enabled features and their control measures were tested against a range of usability principles and it fared well with most of these principles. Therefore, the usability of Facebook's location enabled features and their control mechanisms was seen to be satisfactory by most interviewees. On the other hand, there were various concerns regarding the transparency of Facebook regarding location data capture and use. The Interviewees did not seem to be content and satisfied with the current levels of transparency displayed by Facebook. All interviewees believed that level of transparency displayed by Facebook, significantly affects the level of control users have over their location data being captured. Most interviewees believed that in order to want to control a certain aspect of Facebook, users have to first be aware about that aspect. Most interviewees believed that due to the overall transparency displayed by Facebook and data sharing to external organisations, they currently believe that do not have much control over their location data captured and used by Facebook.

Major Concerns within the Usability Testing and Interviews

1. **Visibility of System's Status**
   Generally, the usability of Facebook's location enabled features and their control features were seen to be good. The usability testing fared well with all usability principles expect visibility of system's status. This is because when completing the tasks related to the check-in feature, the interviewees were unable to understand the source of some of the cities they were checked into. There was no means to understand how and where this information was gathered from. Similarly, interviewees were also unable to understand how the access to their location data will be restricted when location services are turned off. Facebook does not provide any feedback as to inform users what turning of location services means and how this impacts the capture, storage and use of their location data.

2. **Facebook Ads**
   Facebook Ads was an area of major concern amongst most interviewees. This was because interviewees were unaware about the nature of Facebook Ads and to what extent their location data is shared with third party organisations. Similarly, there were also concerned if they are able to control their location data from being shared with third party organisations. It was noted that Facebook was not presenting information regarding their advertisements policies in a manner that was accessible and of value to their users. Unless, they conducted in-depth research on the subject, most users were not aware about their information being shared with third party advertising companies.

3. **Check-In Feature**
   Facebook was also not seen to be very transparent regarding the source of some of the checked in cities. Users, currently are not seen to have any means of understanding

how this information is gathered. This raised the privacy concern amongst many users regarding if Facebook tracks their location without their knowledge.

4. **Location Services**
   Some interviewees stated that they would like to see more comprehensive location data settings. For instance, they would have liked specific settings to control their approximate and precise location data separately. Similarly, they would also like settings that prevent all location data from being shared to external organisations.

5. **Facebook Permissions and Transparency towards potential users**
   Most interviewees did not feel that the location based permission statements were adequate for a potential Facebook user to understand what location data is captured and how it may be used. Most interviewees were of the opinion that Facebook should elaborate and add more information towards their current permission statements on location. Similarly, all interviewees believed that Facebook did not provide perspective/new Facebook users with an accurate ground to understand what location data of theirs can be gathered and how this data can be used.

6. **User's need to keep themselves aware**
   An important statement made during the interviews was that users do not outwardly seek information regarding Facebook's data policies and terms of use. It was said that it does not make a difference if Facebook displays more transparency, users would still not view and use this information. However, most interviewees still believed that Facebook should still be transparent about location data capture and use policies because it is important to keep users informed and aware. An important question that requires further understanding from the results of this user study is how to present key information on Facebook's location data capture policies in a way that is most accessible and valuable to users. This way users are more likely to be able to view it and access it.

Further Analysis of User Study

Questionnaire 1: Presenting Information in a Valuable Manner

Background

As mentioned above, an important statement made in the interviews was most individuals do not actively seek out for more information regarding Facebook's location data and use policies. However, all interviewees stated that users should be aware about details regarding their location data capture and use. Therefore, this questionnaire will aim to understand how to present information is a manner that is most valuable and accessible to users. This way they are more likely to view the displayed information

Questionnaire Aim

This questionnaire will aim to gain an understanding on what aspects about location data capture and use do users require more transparency and user opinions on how this information should be presented to them. The design of this questionnaire is based on the results derived from the interviews conducted during the user study. This questionnaire aims to reach a minimum of 50 individuals across all age groups.

Questionnaire Design

1. **Facebook uses user location data for various purposes. What aspects about the location data would desire more information?**
   - ☐ Which applications use the location data
   - ☐ How the location data are used?
   - ☐ Whether location data are used for ad targeting
   - ☐ With whom the location data may be shared
   - ☐ Whether location data collection and usage can be turned be completely off
   - ☐ None of the above
   - ☐ Other (please specify)

   Reveal user opinions on what aspects regarding location data capture and use do users desire information about. Users are allowed to choose multiple options and add any extra comments or thoughts.

1. **How would you like Facebook to present the information on location data**
   - ☐ Information list presented in terms and conditions that users have to agree with before creating an account.
   - ☐ Information presented in the privacy settings section
   - ☐ Real time pop-up notifications when user's current location is being captured
   - ☐ Notification when a request is made to access your location by an external organization/application
   - ☐ When you hover on an ad, you are informed of whether your location is shared
   - ☐ Pop-up notification when location services are turned off
   - ☐ None of the above
   - ☐ Other (please specify)

Results from Questionnaire

A total of 56 individuals responded to the questionnaire. The questionnaire was answered by individuals across all age groups. 1.85% of respondents were of ages 18 and under, 61.11% of respondents were of ages between 19 and 30, 27.78% of respondents were between the ages 30 and 50 and 9.26% of respondents were aged above 50.

1. **Facebook uses user location data for various purposes. What aspects about the location data would desire more information?**

Options	Responses
Which applications use the location data	39
How the location data are used	42
Whether location data are used for ad targeting	28
With whom the location data may be shared	43
Whether location data collection and usage can be turned completely off	39
None of the Above	0
Other	2

Key Responses: Facebook should not use location data unless requested by the user

WHAT ASPECTS ABOUT THE LOCATION DATA WOULD YOU DESIRE MORE INFORMATION? (USER RESPONSES)

WHICH APPLICATIONS USE THE LOCATION DATA — 70%
HOW THE LOCATION DATA ARE USED — 75%
WHETHER LOCATION DATA ARE USED FOR AD TARGETING — 50%
WITH WHOM THE LOCATION DATA MAY BE SHARED — 77%
WHETHER LOCATION DATA COLLECTION AND USAGE CAN BE TURNED COMPLETELY OFF — 70%
NONE OF THE ABOVE — 0%
OTHER — 4.0%
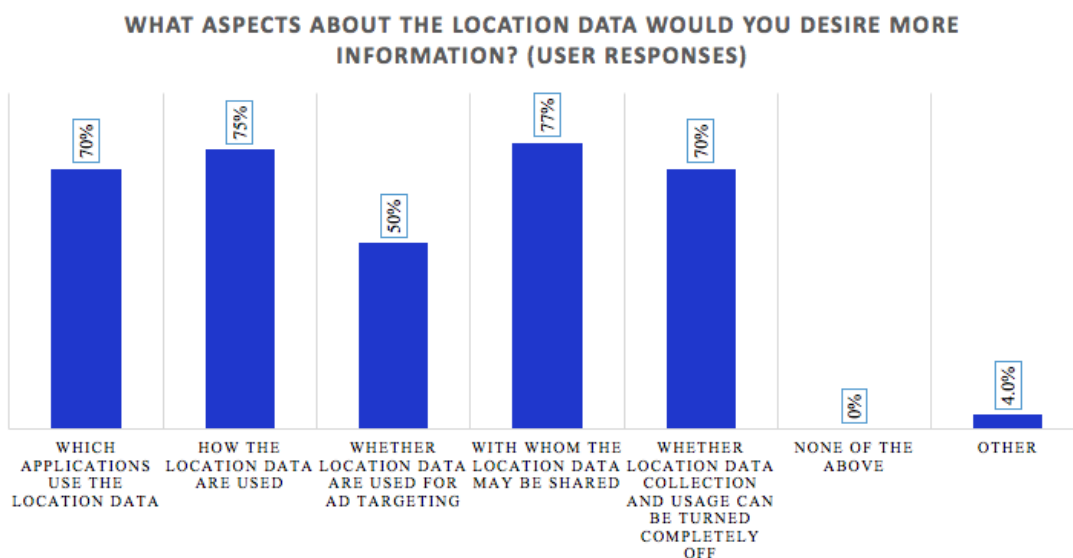
Figure 29.0 Aspects where increased transparency is desired (User Responses)

2. How would you like Facebook to present the information on location data

Options	Responses
Information list presented in terms and conditions that users have to agree with before creating an account. (1)	10
Information presented in the privacy settings section (2)	32
Real time pop-up notifications when user's current location is being captured (3)	42
Notification when a request is made to access your location by an external organization/application (4)	43
When you hover on an ad, you are informed of whether your location is shared (5)	26
Pop-up notification when location services are turned off (6)	17
None of the above (7)	0
Other (8)	2

HOW TRANSPARENCY SHOULD BE DISPLAYED (USER RESPONSES)

OPTION 1: 18%, OPTION 2: 57%, OPTION 3: 75%, OPTION 4: 77%, OPTION 5: 46%, OPTION 6: 30%, OPTION 7: 0.00%, OPTION 8: 3.6%
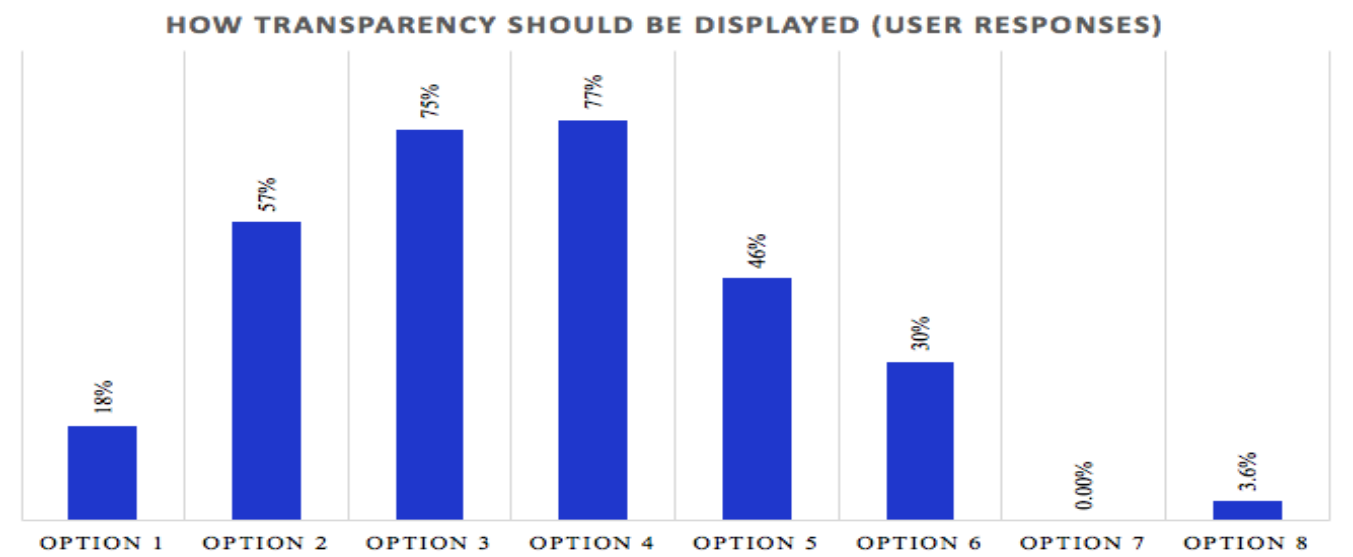
Figure 30.0 how the information should be displayed (User Responses)

.

Analysis of Results from Questionnaire

The results from the first question indicated that users do desire Facebook to be more transparent about their location data captured and used. This was evidenced when all data transparency options provided received a response rate of 50% or over. Most respondents stated that they desire more transparency regarding with whom their location data was shared (77%), followed by how their location data is used. A key user comment made in the questionnaire is that Facebook should not capture user location data unless requested by the user. As mentioned above, these responses state that most Facebook users would require Facebook to more transparent about all aspects of location data capture, usage, storage and sharing. The options that seem to be preferred by most of the questionnaire respondents to display more information about their location data are notification when a request is made to access your location by an external organization/application (79%) and real time pop-up notifications when user's current location is being captured (77%).

6.Conclusions from User Study

1. **Data transparency displayed by Facebook needs to be improved**
   There were a few areas of concern identified during this user study. However, the area of major concern amongst the interviews conducted was the issue of data transparency on Facebook**.** The results from the user study indicated that Facebook has significant aspects about their data transparency policies need to be improved. Users are not able to gain an accurate understanding of their location data retrieval, usage and sharing policies when using Facebook. The results from the user study illustrated that most individuals would like more transparency and control over their location data being captured, used and shared. As evidenced in the interviews and questionnaires, users would like more information regarding when and how Facebook tracks their location and if they are being shared with external organisations. Improving the transparency of data, will also allow users to be able to make more intelligent decisions regarding exerting control towards their data being retrieved and used. However, it was seen Facebook still provides very limited control over the location data shared with external organisations. While users can control their precise location data being shared with external organisations, users are yet to have control over their stored location data and approximate location data being shared with external organisations.

2. **Lower need from users to keep themselves aware of Facebook's data policies and terms of use**
   However, a key statement made during the interviews was that even if they would like more transparency, most users are not concerned about understanding how their location data is being captured and used. A statement was also made regarding even if users find some aspects about Facebook data retrieval very concerning, they would still continue to use Facebook. Research suggests that there is a major element of truth to this statement. In a research conducted on user privacy awareness on Facebook consisting of 329 respondents 23% claimed there are not concerned about privacy when using Facebook, 35.5% claimed that they were barely concerned, 31.6% claimed that they were slightly concerned, 6.1% deemed that were quite concerned and 3.6% claimed that they were very concerned (Tuunainen,2009). It is speculated that this could be because most of Facebook's user base consists of young adults to teenagers. This can be because young users are often very dependent on social media application and hence prefer not to be concerned about various privacy issues on Facebook. Their dependence on social media applications often overtakes their need to be aware about Facebook data retrieval policies and terms of use. The extended questionnaire provided some perspective on what aspects about Facebook's data retrieval and share policies do users require more transparency and how this information can be presented in way the provides value to them. However, user awareness on Facebook's data policies and concerns still remain a concern and further analysis needs to be conducted on the subject. The issue of user awareness on Facebook's data policies and terms of use will be discussed in more detail later in this report. Regardless of reasons of low concern of privacy and security on Facebook, it is important for users to be vigilant when using social media applications. This is because of the crimes that be committed of user data on social media applications. As mentioned above, the number of crimes that have been related to Facebook has grown dramatically over the past few years.

7.Recommendations towards the Transparency and Usability of Location Data on Facebook

The user study above studied user perceptions on the transparency of Facebook and the usability of their location-enabled features and its control measures. This section of the report will outline some suggestions as how Facebook can improve their current level of transparency of information displayed and the usability of location-enabled features. Improving both these aspects should also be able to improve the level of control users have over their location data captured and used.

Usability of location-enabled features and control features recommendations

The usability of Facebook in terms of their location-enabled features and its control measures were generally seen to be satisfactory. However, there were two specific areas of improvement noted.

1. **Display Source of Checked-In Locations**
   An important made throughout the interviews is that Facebook needs to state the source of where they received city check-ins. Interviewees made the suggestion to state this information next to each checked-in city. For example, when the user hovers over a checked-in city, the source of the data can be displayed
2. **Display More Comprehensive Location Services Settings**
   Some interviewees also stated that they would like more comprehensive location services settings. Users suggested that there can be separate options to control their approximate and precise location data. Similarly, there should be privacy settings that enable to users to restrict any aspect of their data from being shared to external organizations

Transparency Recommendations

The overall transparency of Facebook was generally seen to be weak and can be significantly improved. In order for the displayed information to be accessible to users, it needs to be presented in a way that presented value to the majority of Facebook users. The results of the first questionnaire to some extent indicate user preferences on how users would prefer this information to be displayed. However, the suggestions listed below will consist of user input from both the conducted interviews and questionnaire.

1. **More Detailed and Comprehensive Permission Statements**
   Users believed that the permissions displayed in all app stores do not accurately depict the extent to which user location data can be retrieved and used. A significant number of interviewees stated that Facebook should provide the list of features that capture location data and how this location data can be used. Facebook's data sharing to external organization should also be explicitly stated. Furthermore, it was mentioned that users need to agree to this statements before creating an account with Facebook or downloading the application. The above information should also be displayed in the privacy settings section. Therefore, users can conveniently access this information whenever they wish to. Users would like more information regarding when their approximate/precise location data is being traced. Facebook should notify users when their approximate or precise location is being tracked. This can be done in the form of pop-up notifications

2. **Increased Facebook Transparency on Facebook Advertisements**
   It was suggested that next to each Facebook Ad, there should be statements regarding what data was shared with which organizations. These statements can be displayed when users hover over a specific Ad

3. **Display What Aspects Location Services Controls**
   During the interviews it was mentioned that users had a hard time understanding what aspect of their location data, the location services setting controls. When location services are turned off, pop up notifications should be displayed that explains which aspect of user location data Facebook can now not access.

4. **Real-Time Pop Notifications When Current Location is being Captured**
   During the questionnaire, the options that were chosen most by the respondents were notifications when a request is made to access your location data by external organizations and real time pop-up notifications when user's current location is being captured.

5. **Notifications When Location Data is being Shared with External Organisations**
   Similarly, the results of the questionnaire also indicated that most respondents would require Facebook to notify them regarding with whom their location data may be shared and how their location data is used within Facebook and other external organisations.

8.Facebook and Trust

Background

An important point bought forward during the user study is the relationship between trust and Facebook. Few individuals from the interviews stated that they do not trust that Facebook will not stop tracking their location even when their location services are turned off. This raises the question regarding how users perceive trust with Facebook, display trust with Facebook and if it is an important factor enough for users to stop using Facebook. A questionnaire was then designed to study user responses regarding the relationship between Facebook and trust.

Realistically, due to Facebook past record on history of user safety most respondents of this survey can be expected to not outwardly trust Facebook or express concern when the term "trust" is associated with Facebook. Therefore, trust can also illustrate how vigilant users are when using their accounts with Facebook. Similarly, trust can demonstrate if users are concerned about Facebook's data policies and terms use. However, users need to be aware of Facebook's data policies in order to be concerned about the privacy implications associated with Facebook. A user who is highly informed about Facebook data policies and their privacy issues is more likely to be more concerned when trust is associated with Facebook. Therefore, this questionnaire can also to a certain extent demonstrate if users are vigilant and careful when sharing their personal data on Facebook. While a high level of trust might indicate that the current data policies of Facebook do not seem to be of concern to respondents, it may also indicate that users the willingness of users to trust social media applications like Facebook. Furthermore, as mentioned above trust can also indicate the carefulness of users when sharing personal data with Facebook.

User Perceptions on and the Importance of Trust Questionnaire

Questionnaire Aims and Objectives

1. To gain an understanding regarding user perceptions of whether they consider trust while performing various tasks on Facebook
2. To gain an understanding regarding how users display trust when using Facebook
3. To gain an understanding on how users perceive the relationship between the control provided over their data and trust displayed by users.
4. To gauge user responses on the importance of trust between users and social media applications
5. The questionnaire aims to reach around 50 individuals across all age groups. Select questions from the questionnaire was then rewritten as open ended questions and interviews will be conducted using these questions among 3-4 individuals

Questionnaire Design

1. Do you consider trust when performing the following actions on Facebook?

	Yes	No	Not Sure
a. When sharing your status on Facebook			
b. when uploading pictures on Facebook			
c. When entering your personal details (full name, age, birthday, email address)			
d. When sharing your location on Facebook			
e. When sending messages to other individuals on Facebook			
f. When sharing your feelings on Facebook (example liking posts)			
g. Others, Please Specify			

Reveal if users consider trust when performing obvious methods of information sharing on Facebook.

2. You demonstrate Trust in Facebook when you
- ☐ Creating an account with Facebook
- ☐ Adding my personal details on my profile with Facebook (full name, date of birth, place of residence)
- ☐ Regularly sharing images of myself, my friends and family on Facebook
- ☐ Regularly Sharing my emotions, feelings and thoughts on Facebook (sharing status posts, liking status posts, commenting on status posts)
- ☐ Enabling Facebook to capture my approximate/precise location details
- ☐ Sharing private messages with other individuals on Facebook
- ☐ I do not display trust with Facebook
- ☐ Other, none of the above. Please Specify

Reveal user perceptions on how they would display trust when using Facebook. Reveal if creating an account with Facebook and regularly using it insinuates that means that users trust Facebook.

3. If Facebook was to provide you with more control over your data (turn of location being shared with Ad companies), would this affect your Trust in Facebook?

Choose a range from 1 to 5, with 1 being least influential and 5 being most influential	1	2	3	4	5

Reveal user perceptions on how having control over user personal data retrieval influences the level of trust users will have over Facebook

4. The importance of creating an environment of trust amongst social media applications

		Yes	No	Not Sure
a.	If you feel you don't trust Facebook with your data, would you still use it?	○	○	○
b.	Do you think trust is a factor that determines the number of users creating or deleting their account on Facebook?	○	○	○

c. If trust is not a major concern for users, should Facebook still try to take measures to ensure users trust the application?

         ○   ○   ○

d. Other, please specify

Reveal user perceptions regarding the importance of creating trust amongst Facebook. In addition, also gain an understanding to the extent to which users will stop using Facebook if they feel they cannot trust use Facebook and if users believe that regardless of user perception if Facebook should create a trusting environment with their users.

User Perceptions on Trust Interview

Interview Context

In addition to the questionnaire, conducting interviews will allow questions to be asked in a more open ended manner. Users will be able to state their opinions more in a more articulate and in-depth fashion in an interview compared to the questionnaire. Similar to the questionnaire, this interview will attempt to gain an understanding to how users consider and demonstrate trust with Facebook and how much importance is provided to the factor of trust when using Facebook.

Interview Preconditions:

1. The interviewee should be an active Facebook user for a minimum of two years. This is because active Facebook users will be more familiar with Facebook as a social media organisation and the issues surrounding Facebook. Therefore, will be able to more effectively answer the questions asked during the interviews.
2. An individual who is willing to cooperate to answer the questions required for the interview.

Interview Design

Introductory Questions

1. How old are you
   - 18 or younger
   - 19 – 25
   - 25 – 40
   - 40 – 55
   - Older than 55

2. How often do you use Facebook on a daily basis?

- o Less than 1 hour (infrequently)
- o 1 – 2 hours (moderately)
- o More than 2 hours (frequently)

3. Do you consider trust when using Facebook?
4. How would you say, you demonstrate trust with Facebook?
5. If you feel you don't trust your data with Facebook, would you still use it?
6. Do you think trust is a factor that determines the number of users creating or deleting their account on Facebook?
7. If trust is not a major concern for users, should Facebook still try to take measures to ensure users trust the application?

Analysis of Results from the Interview on Trust

The results of the interview were as expected. Most respondents expressed concern and was sceptic when trust was associated with Facebook. A key statement made by a respondent was that considering all the issues associated with Facebook on a regular basis, he does not consider trust with Facebook as a defense mechanism. This statement is especially important because it describes the extent to which some users are dependent on Facebook so much so that they are willing to compromise even thinking about or considering their safety.
The overall reactions towards if users consider and display trust towards Facebook was mixed. While some respondents believed they do consider and display trust with Facebook, others stated they do not. An interviewee stated that creating accounts with and using Facebook on a regular basis is in itself a good indication of displaying trust with Facebook. All interviewees believed that believed that trust is not a major factor that determines how many users creates or deletes accounts with Facebook. Similarly, all respondents also stated that Facebook should create an environment of trust regardless of user beliefs on that matter. A key statement made by an interviewee was that creating an environment of trust can improve Facebook's reputation and hence create customer loyalty. While most user's dependency on Facebook already makes a significant percentage of customer loyalty towards the organisation, this was still an interesting statement that displayed a possible perception on why trust should be created. On the whole, all interviewees seemed relatively aware of Facebook data policies and issues surrounding Facebook. Hence, this could be a major reason why most of them were hesitant when expressing trust in relation to Facebook. The results of the questionnaire will display a wider perception on trust and its importance.

Results from the Questionnaire on Trust

Below are the results gathered from the questionnaire user perceptions of trust and its importance. User comments to each question will also be displayed, however it should be noted that the comments will be curated and inappropriate or irrelevant comments will not be displayed. The questionnaire was responded to by 47 individuals. Most respondents were of the age groups 19 - 30 (57.78%) and 30 – 50 (31.11%).

1. Do you consider trust when performing the following actions on Facebook?

	Yes	No	Not sure
When sharing your status on Facebook	31	13	3
When uploading pictures on Facebook	37	10	10
When entering your personal details (full name, age, birthday, email address)	39	7	1
When sharing your location on Facebook	32	9	6
When sending messages to other individuals on Facebook	24	17	5
When sharing your feelings on Facebook (example liking posts)	26	15	5
Others, Please Specify			

Key Responses:
1. "I don't use Facebook in any of these ways"
2. "Only publish already published material on Facebook."
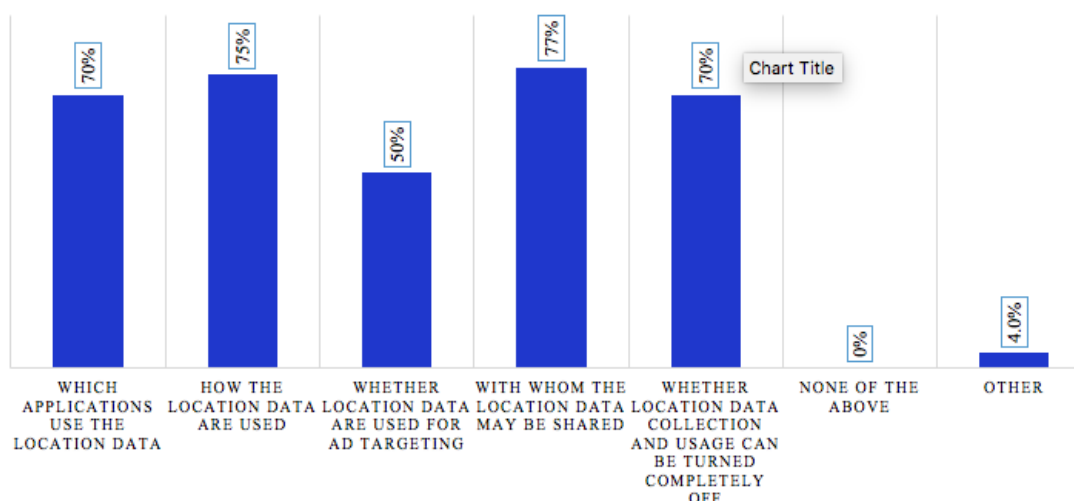
Figure 31.0 Location data transparency

2. You demonstrate Trust in Facebook when you

	Responses
Creating an account with Facebook	27
Adding my personal details on my profile with Facebook (full name, date of birth, place of residence)	31
Regularly sharing images of myself, my friends and family on Facebook	24
Regularly Sharing my emotions, feelings and thoughts on Facebook (sharing status posts, liking status posts, commenting on status posts)	18
Enabling Facebook to capture my approximate/precise location details	23
Sharing private messages with other individuals on Facebook	24
I do not display trust with Facebook	11
Other, none of the above. Please Specify	4

Key Responses:
1. "The word trust is pretty ambiguous. I trust Facebook not to disclose my private conversations with others or my private details DoB, location etc. The other options, posting and images, are public"
2. "Facebook cannot be trusted, as the expectation that they will execute an action you do not wish them to execute is high, even when action importance is considered: (1) they are a for profit company, so trust is not primary aim; (2) their software code is not available as open source, so security cannot be verified; (3) they have to stick to laws and regulations; (4) any of 1-3 can change."
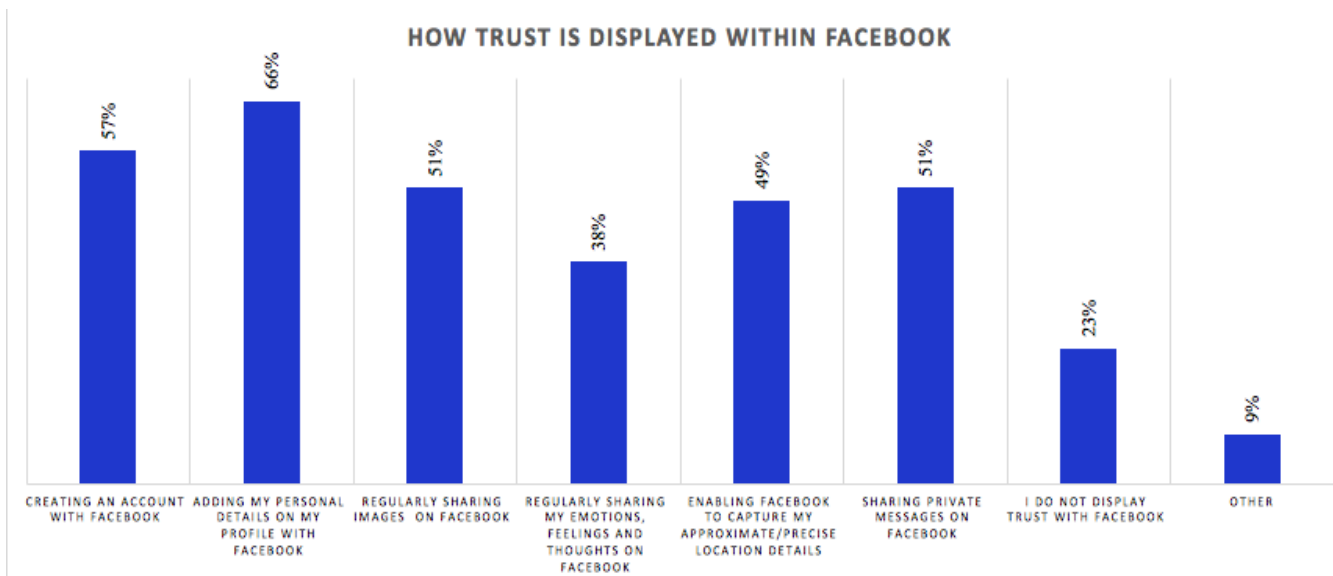
Figure 32.0 how trust is demonstrated

3. If Facebook was to provide you with more control over your data (turn of location being shared with Ad companies), would this affect your Trust in Facebook?

	1	2	3	4	5
Choose a range from 1 to 5, with 1 being least influential and 5 being most influential (User Responses)	3	5	13	19	7

RELATIONSHIP BETWEEN TRUST AND CONTROL (USER RESPONSES)
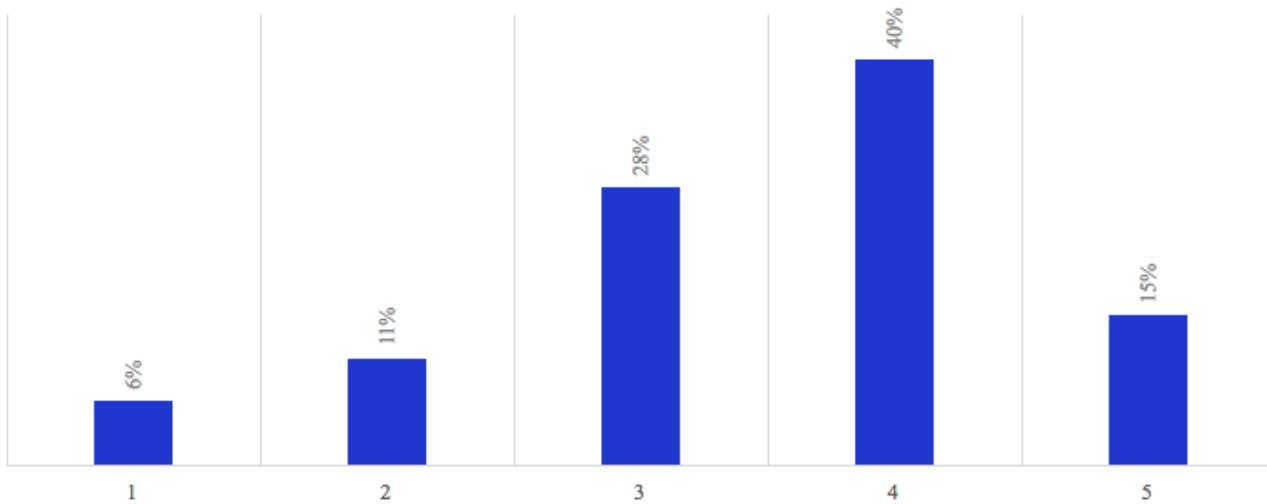
Figure 33.0 Relationship between control and trust

4. The importance of creating an environment of trust amongst social media applications

	Yes	No	Not Sure
If you feel you don't trust Facebook with your data, would you still use it?	13	22	12
Do you think trust is a factor that determines the number of users creating or deleting their account on Facebook?	23	17	7
If trust is not a major concern for users, should Facebook still try to take measures to ensure users trust the application?	39	1	7

Figure 34.0 the importance of trust

Key Responses:
1. "Personally don't care that much but can see it being an issue for many"
2. "Facebook cannot be trusted, but can be used by intelligent users anyway, if they are fully aware of this and protect themself accordingly. The rest is sold to the highest bidder."
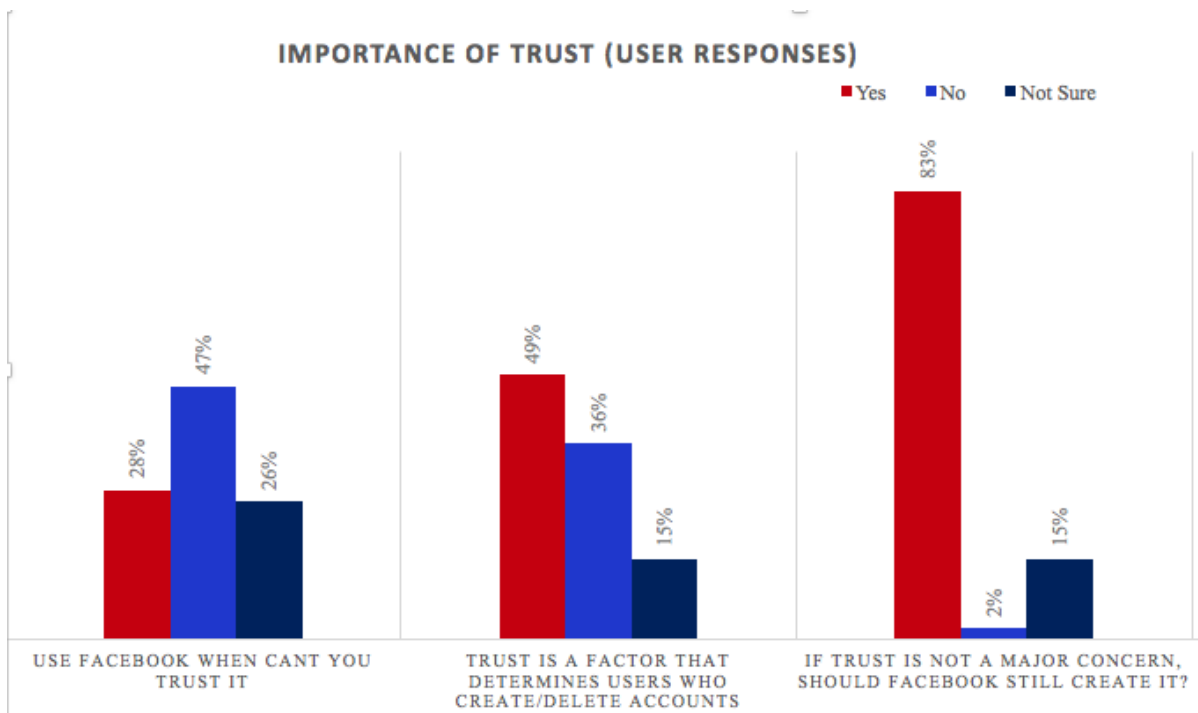3. "If I felt I didn't trust FB I might still use it but I would be more careful about the information I share."

Analysis of Trust Questionnaire Responses

The results gathered from the above questionnaire was far different from the results gathered from the interviews for the same subject conducted above.

The majority of the respondents of this survey agreed that they consider trust when performing most actions on Facebook. On the contrary, only 23% of respondents stated that they do not display trust with Facebook. Most common methods of displaying trust with Facebook seem to be by adding their personal details onto user profiles (66%) and creating an account with Facebook (57%). There were a few comments that expressed concern when trust is associated with Facebook. For instance, a key comment from a respondent regarding the expectation and display of trust was that there are no expectations of trust with Facebook because they are highly likely to execute actions that they know their users would not approve of. The comment also mentioned that Facebook is for Profit Company and while they will operate under current laws and regulations, creating user trust will not be of priority to them. Most respondents agreed that providing users with more control over their data can create more trust between users and Facebook. This was evidenced by over 40% of respondents choosing a rating of 4 to indicate the relationship between trust and control. 28% of respondents stated that they would use Facebook if they could not trust it, while 47% of respondents stated that would not use Facebook without trust. Similarly, 49% of respondents believed that trust influences the number of individuals who create and/or delete accounts with Facebook. 36% of agreed that trust is not a determinant of users creating/deleting accounts with Facebook. Finally, 83% of respondents stated that Facebook should attempt to create trust with Facebook regardless of user perception on the matter. A few user comments suggested that they would use Facebook if they did not trust the application, however they would be more intelligent and careful with sharing their personal data. In conclusion, the results of this questionnaire indicate that most respondents believe that they consider and display trust with Facebook. Similarly, most users also agreed to the statement that they would not use Facebook if they felt they cannot trust the application. While, there were users who believed that trust is not an important factor to be associated Facebook, the figures were relatively smaller in comparison to users who believed the opposite.

While the results of this questionnaire could mean that the current data retrieval and use policies of Facebook do not concern users, it also can mean that the majority of Facebook users are unaware of these policies and privacy implications that can arise from these policies. User awareness of Facebook's data policies and terms of use was repeatedly seen as an area of concern in the previously conducted user study. For instance, a study conducted stated that approximately 73% of respondents were not aware that Facebook shares their personal data with external organisations for advertising purposes (Srinivasan, 2012). Furthermore, in the same study conducted it was also seen that only 21% of the study respondents had read Facebook's privacy policies and only 15% had read their terms of use (Srinivasan,2012). Therefore, it can be said that there is some validity to the point that a significant number of Facebook users are unaware of their data policies and terms of use. However, the willingness of individuals to trust Facebook without keeping themselves aware about Facebook's data policies can be a bigger area of concern. If users are likely to display higher levels of trust with Facebook, they are also likely to not be careful when sharing personal information on their profiles. Due to possible privacy and security threats that can arise when sharing personal data on Facebook, it is extremely important that users are vigilant when using Facebook

9. Discussion of Major Issues Identified

The main aim of this project was to evaluate defining and control user location data on Facebook and all the factors associated with. The two factors associated with the control of location data was seen to be the transparency of location data displayed and presence and usability of control measures provided. While there were few areas of concerns identified, Facebook generally fared well when the usability of its control measures was evaluated. However, another factor identified that affect user control was user awareness of Facebook's data policies and terms of use. A possibility was identified that users are very willing to trust Facebook without being aware of Facebook's data policies and terms of use. This section of the report will discuss the main concerns currently associated with Facebook.

Transparency
An area of concern raised throughout in this project is the level of transparency displayed by Facebook on location data retrieval and usage. In various aspects Facebook was seen to be vague and uninformative on the location data retrieved and shared. An area of major concern was seen to be Facebook's policy of sharing user location data with external organisations. This was especially an aspect of concern because users can find it unclear regarding how they can control their data being shared with external organisations. Facebook states that turning location services off will disable Facebook from being able to share user's precise location data. However, this does not seem to affect Facebook being able to retrieve and share shared location data (check-ins, hometown) and tracking the user's approximate location data. All individuals who took part in the interview believed that greater the level of transparency of location data provided by Facebook, greater the level of control users had over their location data retrieval and usage. This was because these individuals believed that they are more likely to be able to make decisions regarding controlling certain aspects about Facebook when they are aware about those aspects. However, it can be argued that in areas such as Facebook advertisements where users do not have much control over to start of with, being more transparent is not likely to improve the situation. While to a certain extent this is true, awareness can still cause users to act more vigilantly. Being aware about aspects like data sharing to external organisations can users to be more careful about sharing their personal information more than required.

User Awareness of Facebook's Data Policies and Privacy Implications of Sharing Data of Personal Nature
Above and throughout this report it is argued in this report that transparency can improve user awareness of Facebook's data policies and help them make more intelligent decisions regarding controlling their personal data. However, another major area of concern raised in this project is the eagerness of users to trust social media applications without an actual desire to keep themselves aware and informed on Facebook's data retrieval policies and terms of use. As mentioned in the results of the user study, a significant research conducted on user awareness of privacy in social media also indicate that most Facebook users are unaware of Facebook's data capture and use policies. There is a possibility that many Facebook users indiscriminately share personal information onto their profiles without worrying about the possible privacy consequences of doing so. A study indicated that 89% of Facebook users shared their hometown data, 69% shared their contact phone and 38% shared their street addresses on their profiles (Srinivasan, 2012). The majority of Facebook users only allow their friends access into their profiles. However, a significant percentage (34%) of Facebook users still keep their Facebook profiles public, which can be viewed by anyone on the internet

(Srinivasan, 2012). Furthermore, users do not seem to be very aware Facebook's data sharing policies. A study conducted stated that approximately 73% of respondents were not aware that Facebook shares their personal data with external organisations for advertising purposes. Similarly, in the same study study conducted above it was also seen that only 21% of the study respondents had read Facebook's privacy policies and only 15% had read their terms of use (Srinivasan,2012). Therefore, it can be said that user awareness of Facebook's data retrieval and share policies is relatively low. However, the problem here is not only that users are not aware, but there seems to very little desire for a lot of Facebook users to keep themselves informed on Facebook's data policies and terms of use. In addition, users are willing to trust social media applications without necessary being aware of what happens with their personal data on these applications. The trust questionnaire conducted indicated that users display high levels of trust with Facebook. This is concerning because displaying higher levels of trust can also mean that users are not careful as they should be when sharing their data on Facebook. There are various reasons to why users indiscriminately trust Facebook. Srinivasan(2012) believes that most Facebook users are between the ages of 17-24 and individuals within this age group tend to trust systems more and hence overlook the possibility of their data being released to external organisations and unintended people. It is important to place an emphasis on the user's desire to keep themselves informed on the issues surrounding Facebook because, users can only exert control over their data when they are fully aware of the data policies. Therefore, being unaware of the Facebook's location retrieval policies and terms of use in itself significantly (consciously or unconsciously) impacts the level of control these users have over their location data being retrieved and use. Users should not be willing to trust social media applications this easily and they should be careful when sharing their personal data on Facebook. There are various privacy and security threats of dangerous consequences associated with Facebook, therefore users need to be vigilant and careful. While transparency can certainly improve user awareness on the data issues surrounding Facebook, it is still unclear on extent to which merely Facebook being more transparent will improve user's incentive to keep themselves aware of the issues surrounding Facebook.

In conclusion, in the earlier defined conceptual model, only two activities are stated to improve the level of control Facebook users have over their location data. However, during the duration of this project a third factor that also seems to significantly impact control is seen to be user awareness and the need for users to keep themselves constantly informed on Facebook's data policies.

10. Further Research

The major issue raised during this project is the lack Facebook users desire to keep themselves informed on Facebook's data retrieval policies and privacy implications that oversharing data of personal nature can lead to. In order to develop a viable solution to this problem, the subject of what can motivate users to keep themselves up-to-date and appropriately informed about data policies and terms of use need to be studied. In the future, this project can be extended to develop an effective solution towards raising user awareness of the possible privacy implications of using Facebook and keep themselves secure online.

Further research can also be conducted in order to gain an understanding regarding if applications such as Facebook should operate in ways to extensively promote and protect the privacy and security of their users. An understanding should be gained on the ethical benefits and profit based benefits for behaving in this manner.

11. Conclusion

This project investigated the extent to which Facebook provides their users with control over their location data captured and used. Initially, two identified factors that influence the overall control provided to users were seen to be transparency and usability of location enabled features and control measures. While the usability of location enabled features and control measures were seen to be satisfactory with a few issues, there were major issues identified in regards to the transparency displayed by Facebook when location data is captured, used and shared. However, through the course of the project another major area of concern that can significantly influence the level of control is the users need to keep themselves aware of the Facebook's data policies and terms of use. Users need to be aware of what data may be captured and how this data may be used in order make decisions regarding controlling their data. In addition, it was also seen that a significant number of Facebook users were willing to trust Facebook without having an active desire to keep themselves informed on Facebook's data polices and the possible privacy implications that can be caused due to these policies. Initially, during this project it was argued that transparency can help users be more aware of location data capture and use. However, since the problem here is that users may not have an active desire to keep themselves informed regarding Facebook's data policies and terms of use, the degree to which transparency itself can solve this problem is still unknown. Nevertheless, the increase of crimes associated with Facebook suggest that there is a strong case in regards to why users need to keep themselves informed on Facebook's data retrieval policies and terms of use.

12. Reflection

When working on this project, I was faced with constant challenges and unfamiliar problems. I have never been involved in such as detailed research subject before and at times was inexperienced to deal with the issues associated with this project. In the beginning, I struggled with defining the main problem to be identified in the project and structuring all research activities in this project. However, on the advice of supervisor, I developed a conceptual model which help me structure all activities to be conducted in my project systematically. The feedback gained from my supervisor was of utmost importance and it helped guide me through problems and challenges faced throughout the project.

On completion of the project, I hoped to have studied the issue of user awareness of Facebook's data policies and terms of use in a little bit more detail. The factor of user awareness should have been especially incorporated in the questionnaires and interviews conducted on trust. This would have presented more clarity regarding if and how much of Facebook's data policies are users aware of before trusting Facebook. Similarly, in my conceptual model user satisfaction was an environmental factor that needed to be studied and understood. While the user study looked at what aspects about location sharing do users like and are satisfied about, I hoped to have to gained a deeper understanding on user satisfaction and location-enabling on Facebook.

While the process of working on this project was significantly challenging, there are numerous skills that I gained when working on this project. Time management being a major skill that I improved. In order to efficiently complete all tasks required for third year, I had to learn how to efficiently manage my time between the project and other module coursework. Prioritisation was key in efficient time management. Similarly, my communication skills also saw improvement when working on this project. Communication between me and my supervisor was very important and I had to learn to be open to constructive criticism and feedback. In addition, I have improved in my abilities to develop and design research tools such as interviews and questionnaires. On the whole, working on this project was valuable experience and I will always be grateful for the skills I developed during this process.

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