# GNG 1103

**Deliverable B: Needs Identification and Problem Statement**

# Group 13

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## 1. Introduction:

Despite what most people think, items processed at recycling plants are not being recycled properly, primarily because the items are not sorted to their correct bins. For the general public, recycling can be confusing and inconvenient as people may not be able to identify or locate the correct bin for their item. Additionally, specific recycling procedures change between municipalities, creating even more confusion. According to the Recycling Council of Ontario, "Canada recycles only 9 percent of its plastics with the rest damped in landfill and incinerators or tossed away as litter". This statement refers to plastic waste; however, it is safe to assume that recycling of all other categories of waste (cardboard, paper, tins, glass) is at a similarly low level.

When recycling plants receive improperly placed items, they dump these items into landfills, which are increasingly becoming filled and are poorly managed. In Ontario, landfills are currently reaching their maximum capacity and will be exhausted in the next 12 years. The approval process for new or expanded landfills is burdensome and can take a long time — up to ten years in some cases.

Improperly placed items create a lot of unnecessary waste that could be avoided if these items were properly sorted. Our client, Mitch Bouchard, is seeking to develop a product which helps users recycle a wide variety of materials accurately and conveniently. This document will offer a detailed list of the client's needs and specifications for the product.

## 2. Client Needs:

**Table 1:** Client Statements and Interpreted Needs

| Groupings | Client Statement | Interpreted Need | Importance (**1**least-**5**most) |
|---|---|---|---|
| User Needs | The product is easily operated regardless of technical skill level. | The product provides an operation tutorial and the user-interface is clear and easy to navigate. | 5 |
| | Widely accessible and compatible. Available to as many potential users as possible. | Usable on multiple platforms (IOS & Android) without any major hardware requirements. Appeals to a diverse range of age groups. | 4 |
| | Product is free to enable as many users to access it as possible. | Users of the product do not need to make purchases to utilize the product. | 4 |

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| | The product is as convenient as possible. | The product automates as many processes as possible. | 4 |
| Functionality Requirements | Helps users properly recycle everyday items. Reach target of 95% accuracy. | The final product is able to consistently identify waste items and the proper method of disposing of them at least 95% of the time. | 5 |
| | Provide a solution for disposable items that cannot be placed in bins (e.g. batteries). | The product gives the user the information necessary for dealing with items that cannot be placed in bins. | 3 |
| | Eliminate confusion on what products go into what recycling bins. | The product directs the user to the correct waste bin after identifying the disposal method of an item. | 4 |
| | Contaminated items (e.g. pizza grease) that make it difficult or impossible to recycle a product should be handled differently. | The product should be able to identify the presence of contaminants and adjust the recycling procedure accordingly. | 3 |
| Additional Requirements | Ability to track how much and how accurately the users are recycling. | The product can track efficacy and provide data relating to the amount and correctness of user recycling. | 2 |
| | The solution is scalable and usable in as many regions as possible. | The product focuses on the universal aspects of recycling across municipalities to enable use in different Locations. | 2 |

The client's primary objective with this project is to ease the recycling process for the general public. Thus, criteria such as ease of operation and the ability to identify how to recycle items are critical. We want our app to reach as many users as possible so more people can effectively recycle. To achieve this, making our product free and compatible across different systems such as IOS and Android are both highly desirable. In the client's experience, a common reason why people choose not to recycle is due to it being inconvenient or confusing. To alleviate this issue, automating as many processes as possible is highly desirable. A reliable way to direct the users to the correct bin is also quite important. Certain niche recycling cases such as electronic disposal and contaminated items would be nice to implement, but may not necessary.

The client also expressed interest in being able to track how effective the product is and potentially expanding the scale but implementing these would come after everything else and thus are less important considerations.

### 3. **Problem Statement:**

Our client, Mitch Bouchard, seeks a user-friendly and widely-accessible product that helps people recycle more conveniently and reliably. The product should reliably identify recyclable items and inform the user of the proper measures needed to dispose of them.

### 4. **Benchmarking**

Recycling Starts Here was an AR app developed in 2016 to encourage people to recycle. This app was successful in encouraging people to recycle with a game and potential prizes but was inconvenient in that it was only usable with recycling bins specifically designed for the app.

Recycle Right is an Australian app that determines what bin to put items in by having the user filter through a database of products. It also allows users to locate nearby recycling centers and set reminders for waste pickup dates. While this app provides many useful features, it is limited in that it requires direct contributions from municipalities in order to provide detailed and effective information to users. The app is not usable outside participating communities.

Many Canadian communities have their own recycling apps at the moment. TOwaste is Toronto's dedicated recycling app that lets users verify their waste collection schedule and determine how to recycle certain items. Issues with the app include an overgeneralization of products (e.g. plastic food tubs) as well as poor support for individuals living in places such as condominiums without their own individual residence address.

## 5. <u>**References;**</u>

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