POLITEKNIK MELAKA

USED OIL COLLECTION APPLICATION (UOC)

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DEPARTMENT OF COMMERCE

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REPORT ENDORSEMENT

This project report titled “USED OIL COLLECTION APPLICATION” is being prepared, reviewed, and endorsed to fulfill the conditions and requirements of report writing as specified in.

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"We hereby declare that this report is the result of our own work, expect experts that we have outlined its source, and this project will be the ownership of polytechnic.

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The respondent who responded for provide us. Your feedback is incredibly valuable to us, and we appreciate your thoughtful responses. Insights provide us with valuable information that helps us understand your needs and expectations better. Later, we improve our services/products, and your input is crucial in making meaningful enhancements.

ABSTRACT

Used cooking oil waste, contaminated with impurities, can lead to environmental and health issues. Improper disposal can cause clogged pipes, sewage systems, and soil contamination. The Used Oil Collection (UOC) Application aims to bridge connections with food establishments as major users of used cooking oil. Malaysia's diverse food culture encourages food establishments to contribute to the environment and earn rewards. The UOC App recycles used oil waste into biodiesel, a renewable fuel made from plant oils or animal fats. Biodiesel is a cleaner-burning alternative to traditional diesel fuel, reducing greenhouse gas emissions and dependence on fossil fuels.

Used oil waste, particularly used in food preparation and cooking, can lead to environmental pollution, soil and water damage, clogged drains, and air quality issues. Proper recycling or repurposing can help reduce these risks. However, improper disposal can also lead to the waste of valuable resources, such as biodiesel, which could be a sustainable fuel source. Malaysian citizens should be aware of the potential benefits of recycling used cooking oil waste and take steps to reduce its impact.

There are many objectives to the creation and existence of this app. They are namely, to facilitate the proper disposal of used cooking oil waste, promoting environmental awareness and education and finally, turning the issue into a benefit by recycling the used cooking oil waste into biodiesel which is a renewable fuel energy and a capable resource to Malaysia.

Recycling used cooking oil waste is crucial for environmental protection, promoting sustainable energy practices, and preventing clogs in drains and sewer systems. The Used Oil Collection (UOC) Application (UOC App) aims to connect recycling centers and food establishments by allowing users to create profiles and provide location-based services. The app also offers service requests and notifications, allowing food establishments to submit requests for used cooking oil collection and recycling. It also provides analytics and reports on the amount of used cooking oil collected and recycled, showcasing their environmental impact. The app is designed for scalability, allowing expansion to larger areas and potential partnerships between recycling centers, food establishments, and other stakeholders.

TABLE OF CONTENT

LIST OF TABLE AND FIGURES

CHAPTER 1

INTRODUCTION

1.0 Introduction

Used oil waste refers to the oil that has been contaminated with impurities and is no longer suitable for its original purpose. Used cooking oil waste refers to oil that has been utilized in cooking processes and has become unsuitable for further use due to contamination of food particles and other impurities. Improper disposal of used cooking oil can lead to various environmental and health issues.

Improper disposal methods, such as pouring used cooking oil down drains or dumping it into water bodies, can result in clogged pipes and sewage systems. This can lead to backups and overflows, causing environmental pollution and negatively impacting aquatic ecosystems. The presence of used cooking oil in water bodies can also have detrimental effects on marine life by coating aquatic organisms and disrupting their natural habitats.

When cooking oil is not disposed of properly, it may end up in landfills, contributing to soil contamination. The decomposition of the oil in landfills can release harmful substances into the soil and groundwater, posing a threat to the quality of drinking water and the health of plants and animals.

To address the environmental and health risks associated with used cooking oil waste, it is important to adopt proper disposal methods. Recycling used cooking oil is a sustainable option, as it can be converted into biodiesel or used for other industrial purposes. Additionally, some organizations have started recognizing these issues and have acted by collecting the used oil by buying it off them, but these actions have gone unseen by many of us in Malaysia.

With the invention of the Used Oil Collection (UOC) Application, these organizations and recycling centers can bridge connections with food establishments as potential users as the major disposers of used cooking oil.

Malaysia is a country rich with its culture in not only its people and religion but also food due

to its diverse range of races. And as such, food has become a way for people to connect and enjoy each other's culture. Thus, Malaysia is one of the countries with many kinds of food establishments from the simple roadside food stands and hawker's stalls to the grand hotels and gourmet restaurants. These food establishments are major users of cooking oil in the country aside from households in Malaysia. That is one of the reasons why this application is aimed towards the food establishments rather than the households.

With the assistance of the UOC App, the food establishments can realize how they can help save our environment as well as benefit from their actions. Just as the recycling centers can benefit by collecting this used oil waste and recycling it for a better purpose, the food establishments are also able to benefit from this by earning rewards. One of these rewards being an official certification that proves the food establishment is an avid supporter towards this cause.

When it comes to questioning how the recycling centers will handle the used oil waste, they will recycle the used oil waste through a meticulous process into biodiesel. Biodiesel is a renewable fuel made from biological sources, typically derived from plant oils or animal fats. It is produced through a process called transesterification, where these oils or fats react with alcohol (usually methanol or ethanol) in the presence of a catalyst. This reaction converts the triglycerides in the oils or fats into biodiesel and glycerol.

Biodiesel can be used as a cleaner-burning alternative to traditional diesel fuel and is considered more environmentally friendly because it is derived from renewable resources. It is often blended with conventional diesel fuel and can be used in diesel engines with little to no modification. The use of biodiesel helps reduce greenhouse gas emissions and dependence on fossil fuels.

1.1 Business Issues

Used oil waste refers to the discarded oil that has been used in various applications, such as automotive engines, industrial machinery, and hydraulic systems. It is categorized as a hazardous waste due to its potential to contain harmful substances, including heavy metals and other contaminants. Improper disposal of used oil can lead to environmental pollution, posing risks to soil, water, and air quality. Used cooking oil waste specifically refers to the oil that has been used in food preparation and cooking processes. It is commonly generated in households, restaurants, and food processing industries. Used cooking oil can be a valuable resource if properly recycled or repurposed.

One of the many effects of improper disposal of used cooking oil waste is environmental pollution. When cooking oil is improperly disposed of, such as being poured down drains or dumped in landfills, it can lead to soil and water pollution. The oil can form a layer on the water surface, reducing oxygen exchange and harming aquatic life. A second effect of improper disposal of used cooking oil waste is clogged drains and sewer systems. Pouring used cooking oil down drains can lead to the accumulation of grease, causing blockages in pipes and sewer systems. This can result in costly repairs and maintenance for municipalities and property owners.

Thirdly, an effect of improper disposal of used cooking oil waste is air quality issues. Improper disposal methods, such as burning used cooking oil, can release harmful pollutants into the air, contributing to air quality issues. This can have adverse effects on respiratory health and the overall well-being of communities. Another effect of this improper disposal is its impact on wildlife. Wildlife can be adversely affected if they encounter improperly disposed of used cooking oil. The oil can coat the feathers of birds, disrupting their waterproofing and insulation properties. Ingesting the oil can also be toxic to animals.

The most startling effect of this improper disposal is yet to be discussed as it is a waste of our resources. Used cooking oil can be recycled into biodiesel or used as a feedstock for various industrial processes. Improper disposal leads to the wastage of a potentially valuable resource that could contribute to sustainable practices.

When looking into this matter, these effects were discussed thoroughly and though they were all necessary to be considered, the most important effect which could not be overlooked is how the improper disposal of used cooking oil waste has been a waste of resources which could have

been helpful as it can be turned into a renewable fuel which is biodiesel.

Another issue that had to be considered was if the public, the Malaysian citizens, knew that this issue has been causing a big trouble and loss to our country and if there were any measures undertaken. Sadly, when asked around, almost no one was aware that used cooking waste could even cause such issues and that it could be recycled into biodiesel which could be a tremendous source of income for the country and its people.

1.2 Objectives

- To facilitate a proper disposal of used cooking oil waste
- Promote environmental awareness and education
- Turning the issue into a benefit by recycling used oil into biodiesel

1.3 Justifications

Recycling used cooking oil waste is essential for several reasons. Firstly, it prevents environmental pollution by avoiding the improper disposal of oil, which can contaminate soil, water, and air. Secondly, recycling used cooking oil into biodiesel promotes sustainable energy practices, reducing dependence on fossil fuels. Additionally, recycling helps prevent clogs in drains and sewer systems, reducing maintenance costs for municipalities. Lastly, it maximizes the resource's value, turning a potential waste into a valuable product, contributing to a circular economy and overall environmental sustainability.

The Used Oil Collection (UOC) Application, or UOC App, is a valuable initiative as it can bridge a connection between these recycling centers and food establishments. With the user's profile and registration after signing up to the app, it allows recycling centers and food establishments to create profiles with details such as location, contact information, and type of services they offer. The app also offers location-based services with which it implements GPS functionality to identify the user's location and suggest nearby recycling centers or food establishments in need of used cooking oil disposal.

The app also provides service requests and notifications which enables food establishments to submit requests for used cooking oil collection and recycling. Recycling centers can receive and respond to these requests through the app. The app implements push notifications to keep users informed about the status of their requests to be alert of the process of their requests. The UOC App will present waste data management by creating a database to track the amount of used cooking oil collected and recycled as the app provides analytics and reports to users, showcasing their environmental impact and promoting sustainability.

The UOC App has also been designed with scalability in mind as the application has been created with a smaller number of users now but also given certain elements that allow to increase this scale. The design in mind allows the expansion to cover larger geographical areas and cover growing bases. Another opportunity that has been taken into consideration after further recommendation is partnership opportunities. This is due to be done by creating a platform for potential partnerships and collaborations between recycling centers, food establishments, and other stakeholders in the industry.

1.4 Literature Review

1.4.1 Handling The Disposal of Used Cooking Oil

Large food industries like fast food companies, namely Kentucky Fried Chicken (KFC), McDonald's, Marry Brown, etc., all have their own method of disposal of used cooking oil as stated in their company or franchise procedures. However, that is not the case in smaller food establishments and similar. Recycling centers or green organizations have already been taking measures towards the issue of proper disposal of used cooking oil waste but have not been recognized by most of the public.

1.4.2 Lack of Awareness

Due to issues like environmental pollution or similar not being as publicized as political matters or economic matters, most age groups who were more aware of this issue were the children, teenagers and college or university students due to their education syllabus or a required study to be researched.

1.4.3. Lack of Circulation

No matter if there are recycling centers or other organizations taking measures against the improper disposal of used cooking oil waste, their actions were not recognized by the majority of public since it was not as circulated as other topics of interest to the public.

1.5 Business Scope

This application is not only for the recycling centers or organizations, who are already taking measures towards the issue at hand and only aid in the matter, but also for food establishments, who do not already have a method of proper disposal of used cooking oil waste. This application will help spread awareness among the public as the application becomes more in use and becomes known to other communities, for example, household communities, workplace communities and such.

1.5.1 Recycling centers

This application will aid the centers and organizations in taking further action by spreading awareness among the food establishments or communities looking towards this issue. It will also help the centers and organizations to collect information and manage their data on their clients and requests for the picking up or delivery of used cooking oil waste. With the user or client information given, the centers and organizations can determine the amount of used oil waste sent by their users or clients to set a reward system to bring forth interest and mutually benefit the user and client.

1.5.2 Food Establishments

The application help food establishments and communities that collect used cooking oil waste to record and recognize the amount of used cooking oil waste they have managed to collect every day or week and send a request to the nearest recycling center or organization that handle the issue of its proper disposal. The nearest recycling center or organization's location is stated in the app so that the establishment or community can recognize to whom they should send their pickup or delivery request.

1.6 Target Market

The target market for the Used Oil Collection (UOC) Application or UOC App are recycling centers and organizations, and food establishments and communities. The following contains geographic, demographic, psychographic and behavioral data related to the application.

Geographic	Used cooking oil waste disposal in Melaka
Demographic	Male and female aged 18 and above
Psychographic	To help existing recycling centers and organizations in helping collect used cooking oil waste from food establishments and existing communities
Behavioral	Does not solely focus on used oil collection and recycling but also to gain benefits equally