THE INDIVIDUAL'S IMPACT ON AIR POLLUTION

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ABSTRACT:

This is a proposal that discussed about how to solve humanity's pollution problem in the individual level, more specifically Air Pollution, in order to see a decrease on pollution in the foreseeable future. The aim of this proposal is to develop an Air Pollution tracker into the google assistant for easier access. To complete the aim, 70 participants, which has asked about the potential system, will be chosen to answer a survey to collect data. The solution of this problem is to implement a pollution tracker in google assistant to solve pollution that increases over the years on the individual level by having the system remind the user to change their habit to decrease their carbon footprint according to a formula. This is will discuss the significance of this subject along with the methodology and the overview of the system. With this solution not only will this encourage a person to be more attentive to their habits' impact on their environment, but this will also better the health of people in the future.

INTRODUCTION

Since Air pollution have been a problem to modern society as it causes global warming, and companies have been regulated to reduce their carbon footprint to help reduce the impact on this issue, individuals need to step up and reduce their impact as well. As mobile platform is mostly used in this current age, this technology will best suit an individual to help them remind them to reduce their impact on the environment.

LITERATURE REVIEW

Pollution

Pollution is an introduction of dangerous materials or *pollutants* (usually man-made) into the environment [5]. Pollutants are always dangerous to most living creatures and impact the environment in more than one aspect. There are lots of types of pollution including: Air pollution (which will be discussed further), water pollution, land pollution, light pollution, noise pollution, etc.

The impact of pollution to Mother Nature have increased over the years and overall worsen the dangers of it to humanity. From disturbing the wildlife on the ocean [10], to illnesses that causes death [6]. On air pollution alone causes 7 million deaths each year [9].

Air Pollution

The causes of air pollution come in an abundant of forms, as it could be natural or man-made, but the majority of it are from humanity. In an urban area, it usually comes from the burning of fossil fuels and industrial processes [10]. It can even be from indoors, for example smokes from cooking fires or just smoking [9].

It can be said that it is common sense that air pollution can lead to physical problems to a person. Some problems to health including: High blood pressure, stroke, heart disease, chronic obstructive pulmonary disease, lung cancer and acute respiratory infections [6] [9].

It can even decrease cognitive function from 10-16% with more CO_2 parts per million (PPM) in the air around us [1]. It can decrease productivity of a worker significantly according to where ozone level were below federal air quality standards [12]. Highest death due to anthropogenic emissions are in East Asia [7].

Individual's Impact on Air Pollution

As an individual person that lives in a common household, a person would most likely contribute to air pollution either directly or indirectly. A person can cause them from Transportation, electricity, and even goods & services, which can contribute to 77.1 Tonne of CO_2 every year in an average family in the United States [4]. An individual can alone contribute 24.49 Tonne of CO_2, 46.26 kg of Ozone Causing Pollution/NO_x, 58.5 Kg of Acid Rain Causing Pollution/SO_2, etc in a year [4].

Since Air pollution hurts the environment and the human body, people as humanity and as individuals need to reduce the pollutants that humans create in a daily basis, such as: conserving energy at home, using less transport or cleaner commute, using environmentally safe items, etc. [11].

Similar System

Figure 1 Carbon Calculator Welcome Page

Figure 2 Carbon Calculator Result Page
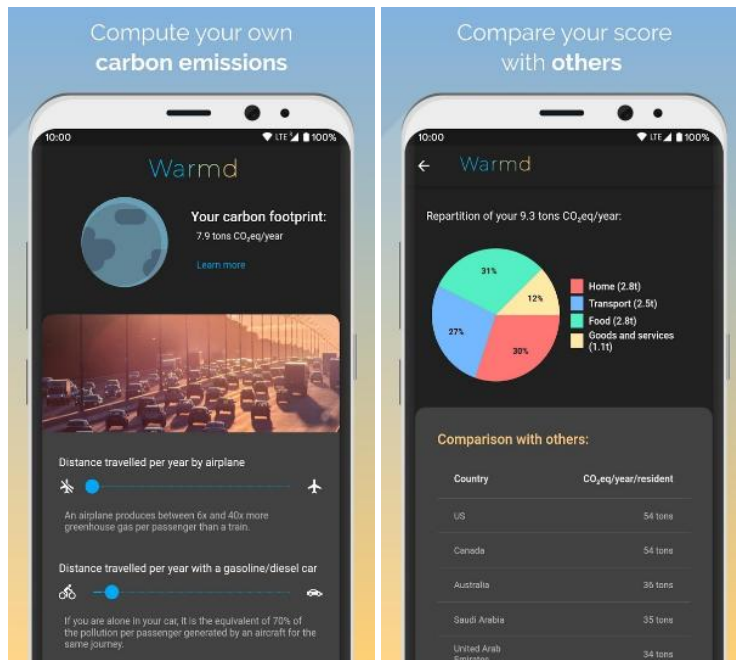
Figure 3 Warmd Carbon Footprint Calculator

This section will be looking at 2 similar system to the proposed system. The 2 system are Carbon Calculator (found in the website: https://www.carbonfootprint.com/calculator.aspx) and Warmd - Carbon footprint calculator (Found in the Play Store: https://play.google.com/store/apps/details?id=net.frju.verdure&hl=en).

Features	Carbon Calculator (Website)	Warmd- Carbon footprint calculator
Reachability	8100+ has viewed this	1000+ has installed this
Design	Webpage Standard	Professional
Usability	Competent User level	Beginner User level
Functions	Only Calculator	Only Calculator

Figure 3 Table of differences between systems

Page According to the table, both systems only has a reach of thousands, as the current proposed system will have as much user as people using the google assistant, which has 500 million users worldwide [8]. Design of the system will be up to Google standard which is professional similar to Warmd- Carbon footprint calculator. Design such as the Carbon Calculator (Website) will be insufficient. As the standard of the similar system in both systems has a usability in at least a beginner level, the proposed system should have at least the same level as it has a wide range of types users, as well as an option to make it advance to an expert level user usability. Functions on both similar systems is only limited to the carbon foot calculator, but the proposed system will also include a local air quality data that can be shown to the user as well as showing the impact as a community.

Problem Statement

People are not paying attention enough to their impact of their carbon footprint to pollution [3]. People aren't aware about how their daily activity/ products contributes to pollution [2].

Aim and Objectives

AIM – To develop an air pollution tracker into the google assistant for easier access.

Objective:

- To Build a simple calculator to let people see their carbon footprint,
- To Track how the user impacts pollution through their daily activities actively, and
- To Update the user about the current quality of air in their local area.

Research Question

- How will it calculate an individual's carbon footprint?
- What are the types of daily activity that contributes into pollution?
- What kind of information about the air will be shown to the user?

Significance of Research

Air Pollution is a big factor into climate change and mainly cause by a type of gas, which is infamously called Carbon Dioxide [4]. Although carbon dioxide isn't dangerous to the human anatomy directly, it can endanger to nature's system, which in turn affects us indirectly [6] [9] [1]. Many know that large factories and countries contribute a huge portion to the current pollution situation, but the general population hasn't paid attention enough to the individual's level of impact on this problem. In spite of the fact that an individual's impact may not seem big to the overall problem in a day or a week, combine that in a year and multiplied by how many people are there living in a similar lifestyles in a community or a city will lead to a considerable amount [4].

METHODOLOGY

Type of Methodology

The type of methodology that will be use in this research to gather up data will be *quantitative*. This is for the reason that, the cause and impact of this research will be on everyone that lives in the modern era using the modern technology, which contributes to air pollution in general. For this, the more time-consuming method, such as interview or observation, will only acquire a few detailed information which will result in a subjective viewpoint of the participant that got interviewed. This will not represent the real data objectively according to this matter. With more data, although not as detail, will be more than enough to get all objective information.

Choice of Method

An excellent choice of the quantitative methodology which this research paper will be using is *the online survey*. This method will be easy to be access by people, get enough sufficient data/information out of the participant and will

result in plenty of raw data to be analyse in either a pie chart or graph to ease the analysing process with free software from the online survey website itself such as Google Form. The question in the survey will be simple and complex enough to not waste the participant's time and acquiring meaningful data.

Participant

The online survey will have to have *at least 70 participants* to get sufficient objective data/information. Though 70 is the minimal, the more data gathered, the better the information acquired from the analysing process will be. The participants will be those in the ages of 18 to 40 uses a mobile phone daily, male or female, and are the main contributor of pollution as an individual. This method will have an increase in response rate because of its convenience.

Sampling

In this process, the best sampling method to show the potential users with different aspects on the users is the *Stratified Sampling Method.* The reason of this method is that the method will result in population based on known aspects of people with closely equal proportions. Since the focus of this software extension is to make certain of the maximum amount of people to use it, creating a general design/functionality that most people find it usable is needed. To do the aforementioned, the design of the proposed system/extension will be based on everyone's general preferences to produce excellent usability on the extension.

OVERVIEW OF THE SYSTEM

The system will be overall simple as it will an extra feature added on into Google assistant. The system will have the ability to let the user input their daily activities in order to calculate their carbon footprint. It will also be able to track and show the impact of the user's daily activities that the user has input in, to air pollution. It can also show the user what the local quality of the air based on information available online.
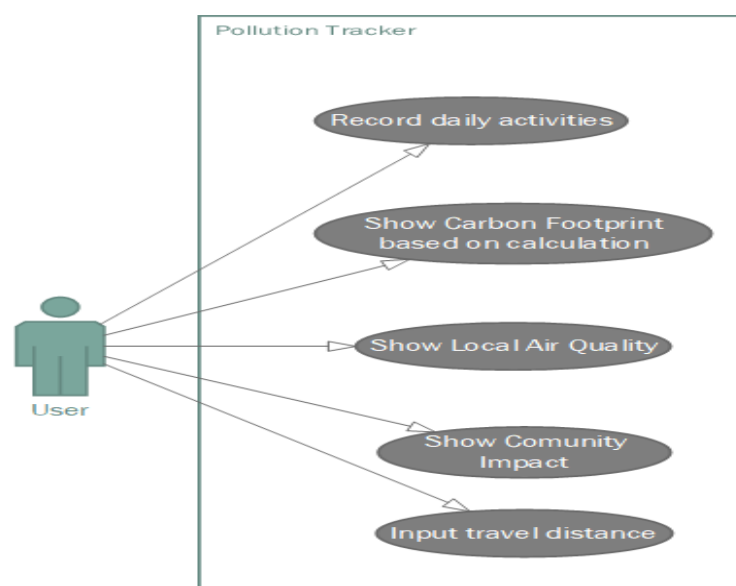
Figure 5 Use Case Diagram

In Figure 5, the diagram shows what a user of this proposed system can do or use inside of the pollution tracker. It lists down all the main functions such as recording the user's daily activities that includes any form of Air pollution, show the user's local air quality, etc.

CONCLUSION

As the planet collects more air pollution from humanity's activities without sufficient ways to fix it, people will have to try to be more conscious to the individual's impact to the current issue. As long as people are reminded of their impact based on their daily activities using this proposed system/ extension, they will at least try to change their habit to help the environment and cause a change into the future. In the future, the best action for the current proposed system is to finetune it according to the needs of the users and be implemented more features to help people to be aware of their impact on the environment and how to decrease it.

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