Envirolift: Environmental Care Application to Improve Public Interest and Behavior Regarding Environmental Issue

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Abstract. Currently, the topic of the environment is being discussed. However, many people do not understand how to implement good environmental care behavior. This is caused by a person's low and limited knowledge and experience regarding the environmental field. Therefore, this research is conducted to find solutions to these problems. The solution offered by researchers is to create an environment-based application that can provide up-to-date and accurate daily news and information about environmental conditions around users and is also equipped with features where users can also search for any activities and communities engaged in the environmental sector that are held at the location that is close to the user. Furthermore, with the various features and eye-catching visual appearance that have been offered by the application, it is hoped that the public's concern, interest, and awareness of topics related to environmental conditions can also increase rapidly. This research is conducted using a design thinking method and obtained data by distributing questionnaires about the environment to predetermined respondents and conducting in-depth interviews with potential users. As conclusion, almost all respondents want to be actively involved in environmental activities and are interested in the features offered.

1 Introduction

Nowadays, the topic of environmental issues is being hotly discussed, both nationally and internationally. Until now the condition of our earth is not doing well. There are countless cases of environmental damage that have occurred so far. One of the main causes of environmental damage is human behavior itself. Irresponsible human behavior has caused a great deal of damage to mountains, forests, and seas. Whereas as humans, it is our duty to protect the environment and nature around us [1].

If the ignorance and indifference of society continues, then the condition of the earth will also get worse. In fact, all human activities and needs are centered and obtained from the surrounding environment [2]. Natural resources are a very important and vital component for the life of all living things in this world. If society continues to use it arbitrarily and irresponsibly, then future generations may not be able to enjoy the natural beauty that we are enjoying now. According to the first in a series of United Nations reports, five billion people, or around two-thirds of the world's population, will face at least one month of water shortages by 2050 [3]. This is certainly a fatal thing and endangers the survival of the human race itself. Water is the most important component in life, where no one can live without it. According to that report, in another 30 years, almost the entire world's population will experience a water shortage crisis.

The world's population has grown rapidly, especially over the past century. In 1900, there were even less than 2 billion people who were living on Earth. It is estimated that the world population will be about 8.05 billion in 2023 [4]. A new United Nations report released today predicts that the world population, which is currently 7.6 billion, will reach 8.6 billion in 10 years, to be precise in 2030, 9.8 billion in 2050 and even can reach 11.2 billion in 2100 [5]. The increase in population also causes an increase in the amount of household waste. Household waste, especially plastic waste such as straws, plastic bottles, and plastic bags, is still the biggest enemy for aquatic ecosystems [6]. The increase in population also affects the volume, type, amount, and characteristics of the existing waste. It was later discovered that household waste plays a major role in pollution in many rivers. Household waste that is disposed of without going through the process first will threaten the sustainability of aquatic ecosystems [7]. Based on data from Jambeck, Indonesia is also ranked second in the world for producing plastic waste to the sea which reached 187.2 million tons after China which reached 262.9 million tons [8].

Currently the development of the internet and social media is increasing very rapidly. Through the internet, everyone can communicate with other people easily too. Everyone can find information from the internet very easily [9]. We can take advantages from this technological development to increase public interest in environmental activities. Internet access is now also not limited to certain people, everyone from all status and

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ages can access the internet easily. This of course can also make it easier for everyone to find new friends or communities that match their interests. It is also makes it easier for the public to get information about conditions and how to implement environmental care behavior.

By utilizing technological developments, the government and the environmentalist community can create applications regarding the environment. Until now, the government and the ministry of environment and forestry themselves have launched an application that is expected to increase public awareness and concern. This application has a feature where the public can see the latest news and activities from the ministry of environment and forestry. In addition, users can also report environmental crimes around them through the application. The existing applications are actually quite good, but it would be better if these applications can also help and increase the public's interest to also participate in environmental activities too. Based on the results of research from MDPI, it shows that public knowledge about environmental care is very good, but their behavior in protecting the environment is unfortunately still not good. This shows that even though their knowledge of environmental care behavior is pretty good, they have not implemented it properly in their daily life [10].

The appearance of the application is also one of the important factors in increasing user interest. The UI and UX of a good application will of course also make users feel comfortable in using the application [11]. On the other hand, an application with a poor UI UX display will make it difficult for users to use and understand the information contained in the application, making this application cannot be used effectively. Unfortunately, most government-made applications still have a bad appearance, making the public feel reluctant to use these applications.

Because of this, environmental care applications need to be specifically designed to help the public to be able to participate in practicing environmental care behavior. People will usually find it easier to learn if they practice it directly. In this way they can also indirectly be trained to apply habits to preserve the environment. This research aims to provide the public with an understanding of the importance of protecting the environment, increasing their interest about environment, as well as train them how to interact with the natural environment, and apply pro-environmental behavior in everyday life.

2 Literature Review

This research was conducted by paying attention to and comparing the results of previous studies that had been done before. The results of the research taken into consideration are inseparable from the research topic, namely regarding the attitude of caring for the environment.

The research that was appointed as material for comparison is research from Arman (2020) entitled "Reducing Public Awareness and Concern for the Environment". By using the literature review method, from the results of this study it can be concluded that an attitude of caring for the environment can be created well if the individual has knowledge and expertise in the environmental field. External factors such as circumstances and behavior of the family and the surrounding community also play a major role for a person in developing behavior pro-environmental [12].

Subsequent research is taken from research by Safira Kusnaini (2021) entitled "Pro-environmental behavior of environmental activists". This study used a qualitative research method using several data collection techniques, including: in-depth interviews with several environmental activists, documentation, and audiovisual using podcasts and YouTube broadcasts. From this study, it was found that environmental care behavior is influenced by five factors, including knowledge, past experience, motivation to act, habits, and the situation and conditions of the surrounding community [13].

The third previous study was taken from Anita Nur Lailia's research entitled "Community Movement in Environmental Conservation" using the case study method. From the results of this study it can be concluded that the role of government and community is very important in increasing public interest and awareness of environmental care behavior. Existing communities and governments can increase public interest by continuing to provide appeals and invite the community to be able to participate in activities related to the environment [14].

Table 1. Formatting sections, subsections and subsubsections.

Researcher	Arman	Saira Kusnaini	Anita Nur Lailia
Research Title	Declining Public Awareness and Concern for the Environment	Pro-environmental behavior of environmental activists	Community Movement in Environmental Preservation
Research Methods	Qualitative Methods	Qualitative Methods	Qualitative Methods
Result	Knowledge and behavior of people around influence the development of a person's pro-environmental attitude	Knowledge, experience, motivation, habits, and conditions around a person can influence his attitude towards the environment	The role of the community and government is very important in increasing public interest in the environment

3 Research Methods

The current research was conducted using the design thinking method [15]. The research begins by implementing the emphasize stage, by conducting a

literature study on the chosen topic. The next stage is define, where researchers apply qualitative and quantitative data collection techniques by distributing questionnaires to predetermined respondents and by asking in-depth questions to potential users through interviews. After obtaining the data from the questionnaires that have been distributed, the data is then analyzed and conclusions are drawn. After that, the researcher entered the ideate and prototype stages, making an application design in accordance with the data previously obtained. After the prototype has been made, the prototype will be consulted with the lecturer and tested on prospective users. After that, the final product was made in the form of an application called Envirolift as a solution to increase public interest in environmental topics.

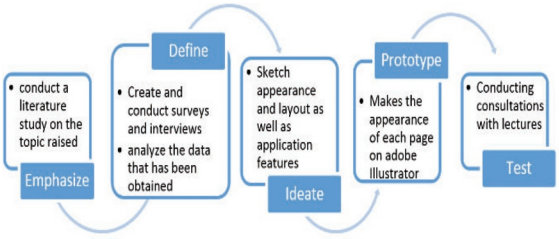

Fig. 1. Design Thinking Stage

The method used in this research is the design thinking method. With quantitative and qualitative data collection techniques using questionnaires and interviews with prospective users. The purpose of using this method is to find out the state of the environment and people's knowledge about environmental care behavior. The target audience for this questionnaire is people aged 18-30 years. By distributing it through the Google Form, this questionnaire has obtained significant results.

3.1 Questionnaire

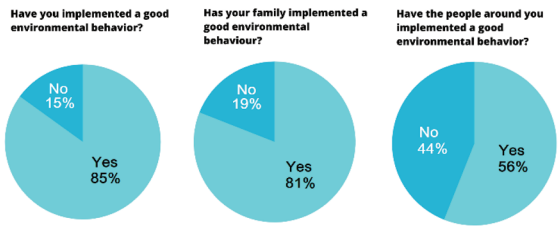

Fig. 2. Questionnaire Resume

From the data attached above, it can be seen that there are still people who admit that they have not implemented good environmental behavior. As many as 15% of respondents have not implemented pro-environmental behavior. In addition, around 19% of respondents felt that their families had not yet implemented good environmental stewardship. 44% of the total respondents even agree that the people in the neighborhood where they live still do not take good care of their environment.

From the scale above, it can be seen that the average score given by respondents to their environmental conditions is 8, with a score of 1 being very bad and a score of 10 being very good. There were no respondents who rated their environmental conditions with a score of 1-3, but only 1 respondent who rated their environmental conditions with a score of 10. This shows that on average their environmental conditions are good enough, but still not optimal.

When asked whether they have been actively involved in environmental activities around them or not, around 38% of respondents answered not yet. 21% of respondents also admitted that they had difficulty finding activities and communities engaged in the environmental sector. However, most of the respondents, to be exact, 70% of the 101 respondents said they were interested in being able to be actively involved in activities and the surrounding community.

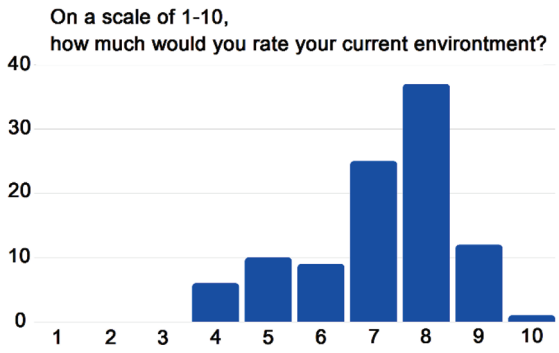

Fig. 3. Questionnaire chart

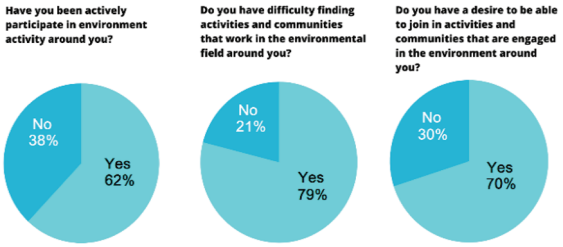

Fig. 4. Questionnaire Chart

3.2 Interview

From the results of interviews that have been conducted with 4 potential users, the following results are obtained: Most of them feel that they have implemented good environmental care behavior, but they still feel that they are not up-to-date with news about environmental conditions around them. The informants use social media, the internet, and online news such as detik.com as their source of information. This shows that they prefer to seek information through their gadgets rather than news from television or print media. All informants admitted that their families and schools had taught and implemented environmental care behaviors, at least disposing of trash in its place, but they admitted that it was difficult to maintain the consistency of this behavior. Three out of four informants have never joined the environmental community. They even admit

that they are confused and don't know how to join the community. However, they are all aware of the important role of the community as a driver and booster of public interest to pay more attention to environmental conditions. Even though they had never joined an environmental community, the interviewees said that they were interested in joining the community, but they were constrained in finding information about the community and activities engaged in the environmental sector. The informants agreed that the use of the application as a medium of education and persuasion is the right medium to increase public interest in environmental topics. The four informants agreed that the use of a point system in this application can motivate users to apply good environmental behavior.

3.3 Research Flow Chart

This research begins with identifying and formulating problems. Followed by searching for journals according to the topic of the selected problem. The next step is to make a hypothesis, then proceed with collecting data. Data collection was carried out quantitative and qualitatively by distributing questionnaires to respondents and holding an interview to prospective users. The target respondents of this study were quite broad, bearing in mind that environmental problems are a very common problem to be encountered, but the research respondents were narrowed to the age group of 18-30 years old. Then the data that has been obtained is analyzed and from this analysis conclusions are drawn.

In this chapter, based on the design thinking method, the researcher will present the research results from previous studies. Through surveys and interviews that have been conducted with prospective users, it was found that the implementation of the "Envirolift" application can help increase public interest in the environmental sector effectively and efficiently. The researcher begins the prototype development period by starting to make sketches and the feature requirements of the application, then design theories are applied in making the application, then the prototype is finalized.

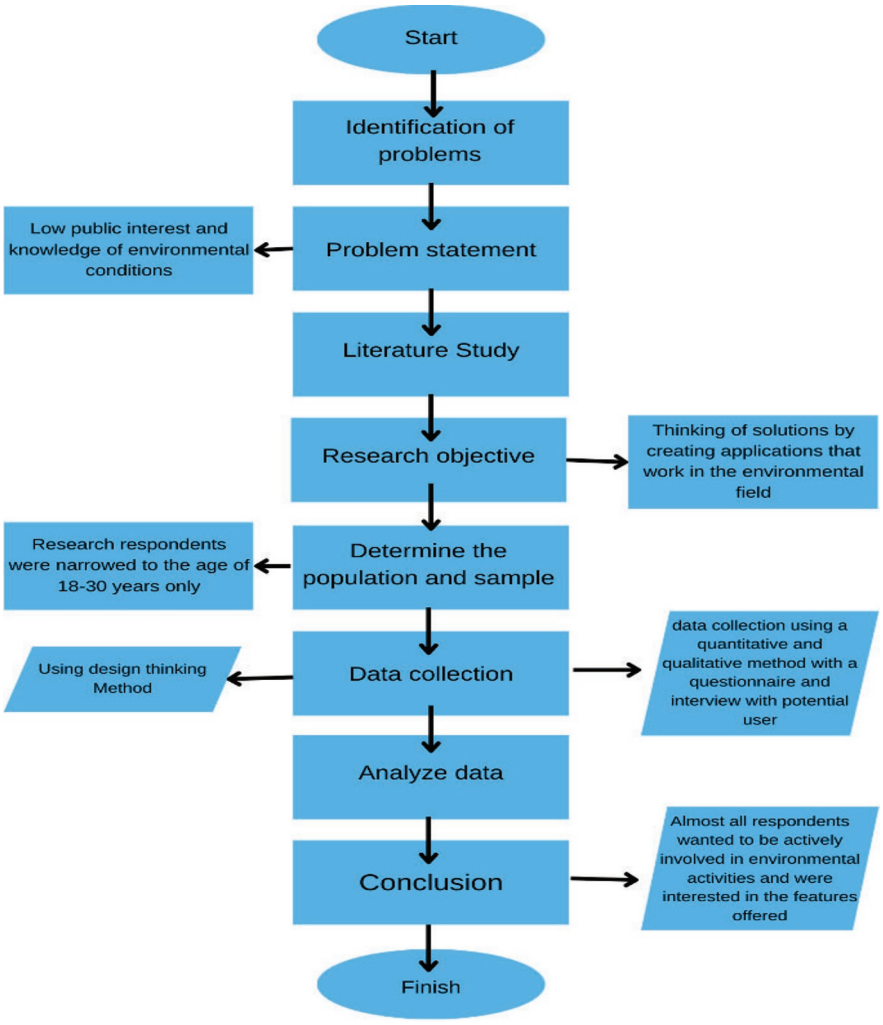

Fig. 5. Research Flowchart

4 Result and Discussion

4.1 Visual Concept

Visual appearance and User Interface are inseparable elements of an application. The colors, fonts, and layout of this application are selected by applying and considering the principles of design thinking. Color is an inseparable part of our daily life. Color also has a strong impact that can affect the emotions and feelings of the audience who sees it. Therefore, color selection must be done well and done through research on the impact of certain colors first. The application of color in a design is fatal.

In addition, the use of colors that look contradictory can make the reader feel uncomfortable seeing them, otherwise the reader will more easily digest and understand the information contained in the design properly if the maximum use of color is applied. By using the right color, designers can direct the audience's attention and focus on what they really want to emphasize. Envirolift itself uses green and yellow as the main colors, where green is very closely related to nature, so it fits the topic of the application being raised. G green is found to have a retiring and relaxing effect as well as giving the impression of naturalness and refreshment. A design must be closely related to the text. Design itself is actually also a means of communication, but the understanding or meaning of a design is very broad and certainly varies depending on the opinions and views of each person. With text, the message from a design can be conveyed to the audience more clearly and precisely.

Typography is also one of the crucial things in the design of an application. The use of typographic styles can affect the impression of the audience when they see a design. The use of fonts such as serif font types can create a formal and stiff impression, while fonts such as sans serif fonts can create a friendly and fun impression due to their more rounded shape and lack of hooks. After doing more in-depth research and research regarding the design that fits the application, it was decided to use a sans serif font to depict a friendly and fun impression, in accordance with the application concept that wants to invite its users to pay more attention to their surroundings in a fun and enjoyable way.

The layout of an application is no less important than typography and color. A good UI layout can certainly make it easier for users to use the application more effectively and easily. A messy UI UX layout will make users confused and reluctant to use the application. Through surveys and interviews that have been conducted previously, according to respondents, applications with a good UI UX layout display are pleasing to the eye, they are shopkeepers and care about protecting them.

4.2 Feature and pages

The splash screen displays the "Envirolift" mobile app logo. The logo of this application uses two main colors, namely dark green and white. These two colors are used because of their contrasting colors. The logo of this application is a combination of arrows pointing up and the shape of a tree, which can be seen from the presence of the tree branches. The philosophy of making this logo is because as the name implies, namely Envirolift, where this application aims to improve the condition of the surrounding environment. Therefore, the shape of the tree is taken to symbolize the environment and the shape of the arrow is chosen to describe the environmental conditions which are expected to improve and increase rapidly with this application. On the logotype, the words "lift" are written in italic to provide emphasis and to make it more pleasing to the eye.

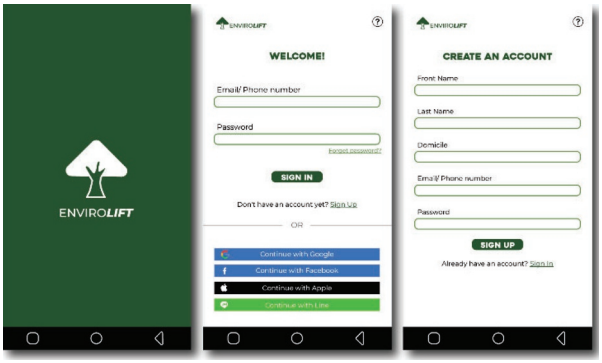

Fig. 6. Sign in and sign up page

On the start page, the user will be directed to the registration page. Users who already have an account can enter their account username and password to be able to log into their account. If the user already has an account but forgot the password, the user can press the "forget password" button, after that the user will receive an email to change their password. Meanwhile, users who do not have an account will be directed to the sign-up page, where users are asked to enter their first name, last name, email, password, and domicile. The function of requesting data from the user's domicile is because after entering the personal data, the application will adjust the information that will appear according to the domicile where the user is.

Fig. 7. Home and Search Page

After the user has successfully logged in, they will be directed to the home page which will display recommendations for information, news, activities, and communities related to environmental topics. On this page, users can find up-to-date information about their surroundings. If the user wants to find more in-depth information about environmental activities around them, the user can use the "search" feature. Through this feature, users will be provided with more complete and varied information about the news and environmental activities they want. In this feature, users can also view their search history, and see what topics are trending and busy being searched by other users. On this page, the user is also given recommendations for searching options that are in accordance with the user's interests in accordance with the applicable algorithm. This application also provides additional information about tips and tricks for processing waste, how to get clean water, how to maintain water quality, etc.

This application also offers users many interesting vouchers. These vouchers can be obtained by exchanging a number of points, these points can later be obtained by each user involved in environmental activities in their surroundings. Each activity will give you a different number of points. Users can check what activities they have participated in and how many points they got from these activities in the "activity history" feature. These activities are arranged sequentially according to the time the user performs the activity. Users can also customize what activities they want to check. The existence of this point system can attract the interest of users who were previously not interested in participating in environmental activities. This application also provides a "my profile" feature where users can check the number of points and vouchers they have earned. Apart from that, in this feature, users can also check their activity history, their favorite activities or news, manage their accounts, write complaint forums, seek help from call centers, or create their own events or activities

Fig. 8. History and Profile Page

5 Conclusion

In essence, the current research proposes a mobile application design by using design thinking process. In this study, researchers design the user interface of mobile application "Envirolift" to help the community to be able to always monitor and be actively involved in maintaining the condition of the surrounding environment. This is quite a challenge for designers, how designers have to make application designs that match the topics presented and with an eye-catching appearance to attract user attention by also considering the design elements used, such as typography, color palette, layout, etc. In the future, researchers hope this research can be used for further studies as a reference for mobile applications published to support environmental care actions.

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