**Chapter 6: User Evaluation Results Discussion, Project Contributions & Achievements, Conclusion, Scope for Future Work**

After the application was fully developed, tested, and uploaded on *Google Play Store*, an Evaluation Survey Questionnaire was created, using *Google Forms*, and distributed to target audiences to gather their feedback and opinions on the developed application. Based on the analysis of the results of the performed User Evaluation, it became possible to demonstrate the extend to which the developed application has fulfilled users’ requirements and has reached their expectations, to analyse what overall were the contributions and achievements of the Project, and to conclude the Thesis and suggest scope for future work on the Project.

**6.1 Evaluation survey questionnaire analysis**

There were **6** respondents to the survey in total (please, see *Appendix XX*). This questionnaire assesses the opinion of users regarding the functionalities of the application as well as the functionalities of Google Assistant connecting to the database through the Google Nest Hub and/or mobile phones.

To Q1, *How user-friendly did they find the application to use,* received 6 responses, all the surveyed (100%) found the application very friendly.

To Q2, *How appealing did they find the overall design of the application (color scheme, font size, design features)*, from 6 responses 50% found the application very appealing and 50% found the application appealing.

To Q3, *How did they find the navigation through the application,* 1 person (16.7%) out of 6 responses found it easy and 5 people (83.3%) found it very easy.

To Q4, *Did they find the login and registration process clear and simple,* received 6 responses, all the surveyed (100%) found the application clear and simple.

To Q5, *How satisfied were they with the application’s ability to stablish connection with an IoT Home device to control some of the application’s functionalities,* 1 person (16.7%) out of 6 responses was satisfied and 5 people (83.3%) were very satisfied.

To Q6, *How satisfied were they with the functionality of browsing categories of pets,* from 6 responses 50% were very satisfied and 50% were satisfied.

To Q7, *How satisfied were they with the functionality of filtering browsing to a specific pet size (Large, Medium, Small),* 1 person (16.7%) out of 6 responses was satisfied and 5 people (83.3%) were very satisfied.

To Q8, *How satisfied were they with the functionality of filtering browsing to a specific pet breed,* 2 people (33.3%) out of 6 responses were satisfied and 4 people (66.7%) were very satisfied.

To Q9, *How satisfied were they with the functionality of having detailed information for the chosen pet (picture, age, personality, shelter),* all the surveyed (100%) were very satisfied.

To Q10, *How satisfied were they with the functionality of looking the location of the chosen pet shelter on the Google Maps, plus contact information about the shelter,* 1 person (16.7%) out of 6 responses was satisfied and 5 people (83.3%) were very satisfied.

To Q11, *How satisfied were they with the functionality of sending intent of adoption form for a chosen pet,* all the surveyed (100%) were very satisfied.

To Q12, *How satisfied were they with the functionality of receiving e-mail from the shelter as response to your intent of adoption form, sent for a chosen pet,* 1 person (16.7%) out of 6 responses was not satisfied, while 2 people (33.3%) were satisfied and 3 people (50%) were very satisfied.

To Q13, *How satisfied were they with the knowledge that this application uses data verification, user authentication, and embedded authorization rules as security measures to prevent unauthorized access to the application’s data,* all the surveyed (100%) were very satisfied.

To Q14, *Did they encounter any technical problems, while using the application (crashing, not opening the intended screen, or not responding),* 1 person (16.7%) out of 6 responses found a technical problem while using the application, while 5 people (83.3%) did not find any issues. The person who found a technical issue while using the application stated that they could not find the confirmation button to finish their registration. After this issue has been reported, we were able to verify that it was a screen size compatibility issue, where the user’s phone screen was smaller than the ones the application was designed for, which has been rectified by simply adding a scrollbar allowing any different sizes of user’s phone screen.

To Q15, *Did they have any suggestion to add/remove/improve functionalities of the application,* 2 people (33.3%) out of 6 responses has suggestions regarding the application, while 4 people (66.7%) did not suggest anything. The two suggestions were related to the filters within the application, where the users found it would be more efficient if they could select a specific breed without having to select a specific size of pet first.

To Q16, *Overall, how satisfied were they with the application,* all the surveyed (100%) were very satisfied.

To Q17, *If they would recommend this application to friends/colleagues to use,* all the surveyed (100%) would recommend the application to friends/colleagues.

**6.2 Project Achievements**

Based on the Analysis performed, it can be stated that the Project achieved **all** its objectives, as stated in Chapter 1:

* A Project Proposal was created, based on the performed initial Literature review (Secondary research) on the topic;
* Primary (Quantitative) research with Initial Survey Questionnaire was performed to gather opinions of the public (potential adopters) about the need of the proposed for development application, desired features, functionalities and requirements of the application;
* The results obtained from the Survey were critically analysed and application requirements were specified, developing Conceptual Model for the application;
* Using Storyboarding process, the Graphical User Interface for the functional specifications was designed, together with appropriate data structures;
* Coding and thorough testing of the designed application was performed, as well as its integration with the *Google Home* IoT device;
* The application was then evaluated by potential adopters, who were owning *Smart Home* (IoT) device (*Google Home*);
* The Thesis document was completed with Conclusions and Scope for Future work on the project.

**6.3 Project’s Contributions to the Research and Development Field**

Today, when utilisation of smartphones and smart home IoT devices is the predominant way of communication and running daily activities, developing a mobile application to provide a searching tool, integrated with a Smart Home IoT device for potential adopters to find easily their desired pet to be loved, is a viable proposition.

The main idea behind this project was to provide usable tool to simplify the process of searching and finding desirable pet. In Ireland, the process of pet adoption can be quite complicated, from the stage of searching and finding desired pet, to the stage of actually adopting it. The adoption process itself depends on the shelter that holds responsibility of performing house checks and verifying the background of the potential adopters. However, the current Project simplifies to a great extend the process of searching and finding desired pet in a way that potential adopters do not need to leave their home to find the preferred pet. Instead of spending valuable time on visiting tours to several sanctuaries in search for a pet, this is done by using the developed mobile app, or even just by asking your Smart Home device, that can be linked to the app, and find it for you through the app. The developed mobile application offers display of every animal, available for adoption at number of sanctuaries in Ireland, or if the adopter prefers - they can use filters to search for a specific desired animal.

Nowadays, potential adopters have to search through several different Facebook pages, Instagram accounts, websites of different shelters, or to physically visit the shelters, since in many instances the information uploaded on any of the mentioned media types is not regularly, or in real-time updated, as was proven by the research performed on the topic. The opportunity to have all information about the shelters and the animals available there for adoption, in a real-time manner, on a single platform, is a great achievement that simplifies the adoption process for everyone wanting to adopt a pet.

With that in mind, this project incorporates the *7 Principles of Universal Design,* such as *Equitable use, Flexibility in use, Simple and Intuitive use, Perceptible information, Tolerance for error, Low physical effort, Size and space for approach and use* (National Disability Authority, 2020)*,* which can lead to the improvement of the animal adoption rate in Ireland in a simple and efficient way, by using IT capabilities to its maximum potential to have real effects on potential adopters and pets to be rescued.

**6.4 Personal and Professional Development Achievements**

Many personal and professional skills were developed throughout this project: working as part of a team is one of the most valuable experiences a person can gain from working on a holistic, real-life project, such as this one, and producing software to Industry acceptable standards. We have gained thorough knowledge on time management, Project development and management (from its inception with Project Proposal writing, through its Analysis, Design, Coding and Testing stages, to its User acceptance with User Evaluation Survey), and mainly learning to deal with uncalled situations and how to overcome unexpected problems. We were developing this project during a world Covid-19 Pandemic and a country lockdown conditions, which limited our possibilities and yet - we were still able to complete development to a high standard.

This project was an opportunity to apply all the knowledge from our studies into analysis, design, visualizing and development of Software to create a mobile platform integrated with smart home IoT device, which we believe will provide a great service for a great cause within the pet adoption reality in Ireland. The opportunity to learn and use brand new mobile development platforms and languages, such as *Android Studio*, Google’s *Firebase* no-SQL real-time database, and *Dialogflow,* were also major achievements during the development of the Project.

Within this project we learnt how to share and delegate responsibilities and activities, and mainly how to help each other in times of need. Things not always go as planned, thus we developed the ability to be always flexible, and provide different alternatives when the code did not work as expected.

**6.5 Conclusions**

This application was developed for potential adopters with the aim to lessen the hassle of finding a pet to adopt by using a single platform which contains information on pets available for adoption on every sanctuary within Ireland without having to travel to each place and see all the pets. We also wanted to provide a link between the Google Assistant platform and the app by gathering information from the database and displaying in the screen whether it is using a mobile phone or a Smart Home device (Google Nest Hub).

The results of our evaluation survey were generally positive. Users found the application easy to use and navigate as well as user-friendly, clear and simple, and they were satisfied with most of the functionalities and the application in general. Our goals towards these criteria were very important thus it is nourishing having such responses.

Though this application has such great responses from user, it can still profit from possible future work in order to improve and add more functionalities within the application.

In conclusion, potential adopters, shelters and pets for adoption can benefit from Pawdopter – the Pet finder app in a way that this service is still not provided in Ireland. Also, the idea of simplifying the search for a pet to be adopted is proven to be needed and welcomed to users as potential adopters and most importantly in terms of improving the adoption rate in Ireland.

**6.6 Scope for future work**

Due to a short time frame allocated for the development of this application, it was unrealistic to undertake the shelters’ interface thus, the shelters’ information as well as the pets’ information were hardcoded onto the database. With that in mind it would be a major improvement to this project the development of this interface once the main idea of the project was to create an interconnected database with all sanctuaries within Ireland in which the information of either the shelters and the animals would be updated and uploaded by the shelters.

For the same reason, the High-end solution from the three proposed designed solutions at the end of the analysis phase of the project, was also unrealistic to carry out. Within this solution, a chatbox would be developed allowing the communication between shelter worker and the potential adopters. Thus, this functionality would also be a great improvement within the project and the quality of the pet search.

Also, with the evaluation survey we could determine that the filters (Category, Size and Breed) should not be nested. The reason why is because people who already know a desired breed should not be obliged to go through the step of selecting the size of the animal. That would mean less clicks on the screen. However, it would be beneficial to keep the category to be selected mandatorily at first to optimize the list of breeds to be displayed on the dropdown menu.

Another improvement to be made towards the security of the application is related to the storage of the users’ password onto the database. Since the Firebase has an authentication system there is no need for us to store this information which can cause a risk on the security regarding the access of this sensitive information.