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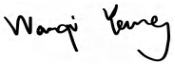
___Wanqi_Yang 46600284____	
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Ouah Ouah Friends: Designing Towards Support in Pet Owner Community

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ABSTRACT

In recent years, the pet owner community gains popularity because of the improvement in technology. Pet owners can easily find and join the relevant community through the internet. However, some pet owners are still not willing to join these communities. In this paper, we aim to help pet owners be connected to each other to have long terms support for their pets, so we investigate the reasons for the pet owners' willingness to join the communities through several human computer interaction (HCI) methods. To elaborate, we conduct photo elicitation and mapping methods to gain insights from participants. Digital ethnography is also adopted to gain information about the pet community. We observed several online communities on several social media, such as Facebook and Reddit, and concluded the reasons that the users joined them. This paper also uses the observation method to collect the data. Those data significantly improve our understanding of pet owners. Through them, we identify that entertainment, seeking support, making new friends, and seeking recommendations are the main reasons that the owners join the community. An uncontrolled environment and information quality are the main pain points for the owners refusing to participate in the community. Based on these results, this paper proposes the AR system – Ouah Ouah Friends. It helps pet owners can relate to each other in a more stable environment. This system can discuss how to alleviate the owners' pain and obtain long terms support for their pets.

KEYWORDS

Human Computer Interaction (HCI), Mapping, Digital Ethnography, Community

1 INTRODUCTION

The recent improvement in technology helps pet owners easily accesses the various pet community. They can join the pet owner communities by searching for them on social media. However, some pet owners are still unwilling to join these communities because of several unknown reasons. This makes the pet owners hard to gain long-term support for their pets. In this paper, we conduct quantitative research to explore the pet owners' main points for joining the community.

We adopt the photo-elicitation method to obtain the data. Based on our experience, most pet owners always have affection for sharing their pet's stories with others. We believe that this method is suitable for us to conduct, helping us obtain more insights from the participants. Additionally, since we mainly focus on the communities that the pet owners join, we adopt a mapping approach. This approach asks the participants to map their relationship between themselves and the communities. The data will clearly describe the owners' attitudes toward different communities. We can improve our understanding of their reasons that joining the communities efficiently. Moreover, we practice the observation method to discover how the pet owners interact with each other. Finally, digital ethnography is applied to obtain information about the online community. This allows us to understand what're the main pet owners' purposes that interacting with another owner online.

Based on the data obtained from those methods, we discover that accessing information, pet service, and entertainment is the main reason for pet owners to join the community. Additionally, the main points are the uncontrolled environment and information quality. To address these problems, we propose Ouah Ouah Friends to help pet owners be connected to each other without facing that situation. Our contributions are listed as follows:

- We investigate the comprehensive reasons that pet owners engage in the community, and the pain points that the pet owners meet.
- We conclude the responses from the participants and provide the pet owners' insights.
- We propose Ouah Ouah Friends, an AR system which can help the pet owners be connected to each other and get long-term support.

The rest of this paper is organized as follows. Section 2 reviews related literature. Section 3 presents the methods that we conduct. Section 4 suggests the findings. Sections 5, 6 and 7 provide our critical analysis of findings, initial design concept, and conclusion respectively.

2 LITERATURE REVIEW

2.1 The sense of community

Traditionally, a community is a group of people who come together because of geographical factors to create their own culture with a common experience, and the cohesion generated by this culture born of itself brings them a sense of community [5, 7].

However, as society develops, geographical factors become less important in the formation of communities. The emergence of community culture and shared values are the determining factors in the formation of communities, and these allow people to no longer rely on geography to divide communities, and communities no longer represent just a geographic grouping [8, 12]. Under these conditions, a forum or discussion group created because of a common interest is also a community [10]. The study by Dana *et al.* [10] indicates that even in video sites such as YouTube, which are not built for social purposes, communities with shared culture and values are still built there over time. Therefore, our study should not be limited to tradition social media when collect data from online communities; regular interaction on the web may also a type of community. While we use community cohesion as a measure of a community, we can make a hypothesis that in everyday life, there are in fact many micro-communities that may not have significant strong ties (e.g., reciprocity) but that have ongoing rapport with each other and continue to foster such relationships through communication in the community. They may just be the people share the same regular time period to go to dog park.

McMillan and Charvis *et al* [7] defined four points as factors of sense of community, as the boost factors of cohesiveness, which are membership, influence, fulfilment and shared emotional connection. Our project as a focus on the examination of the attractiveness of the community to the target population, these four factors can we use as criteria to analyse, evaluate and compare communities. Considering from the four dimensions, we

can systematically analyse the dynamics and resistance of the community to absorbing the target population.

2.2 The Need for a Pet Community

As a powerful part of generating community cohesion, reciprocal relationships maximize a community's ability to sustain and attract new community members [1, 7]. Therefore, an research about what helps can the pet community offer provide data for our subsequent design goals of promoting target populations to join the pet community.

According to the existing research [4, 11], medical assistance is a great help that the community can provide. In the era of the development of the Internet, remote medical assistance has become more extensive and has a huge room for rise [4]. Telemedicine and the online community can magnify the reciprocity of the community infinitely. On the other hand, the bad information in the online community makes pet owners afraid and repelled to look for information online [3], which hinders the development of mutually beneficial relations and affects the activity of the online community.

At the same time, pets as a social capital can help owners to build new relationships [14], and this help is based on the social needs of pets, so pet owners have their own social needs [13]. Pet communities are the best way to address this need. We can even assert that many pet communities have been created precisely because of the social needs of pet owners. For pet owners who have a social need, joining a pet community is a natural thing to do. In this case, it is not the attractiveness of the pet community that needs to be considered, but how to be exposed to pet owners and the existence of factors in the community that allow them to sustain their relationship.

2.3 The Attraction of a Community

As the communities studied are divided into traditional and online communities, the attraction factors for the target population are very different and need to be discussed separately as they have different vehicles. In traditional offline communities, even though geography is no longer a key factor in community formation, we can make geography play a role in enhancing community attractiveness through design [6], such as building pet-friendly facilities. Through the excellent municipal design, functional design and interaction design, we can rely on the user's environment to play a subtle influence on

the user, so that they are invisibly influenced by the community and thus deepen their community identity [6, 7].

And as an online community as a part of the Internet and social media, how to expose to users is not the difficulty, the difficulty is perhaps how to maintain user viscosity. The recommendation algorithm that helps TikTok dominant the market is a great tool to enhance user viscosity. A study have shown that users can maintain a high level of stickiness and activity when they are constantly exposed to content they are interested in, and can even have withdrawal reactions when they move away, which is dangerous, but using recommendation algorithms wisely can ensure that new pet owners can stay active in the community and develop regular social habits, deepening the common emotional connection [9]. Another solution is a social network based social viscosity enhancement model, which can promote social viscosity by segmenting large communities into smaller communities [2], while the content produced by the smaller communities will generate activity in the larger communities, and the activity will feed back to improve the viscosity of the smaller communities. This model can enhance the social identity and cohesiveness of the target group under the user's autonomous control, and is a model that we can further observe and verify in the follow-up research.

3 METHODS

According to the say-make-do model, we involved five different research method - photo elicitation, mapping, digital ethnography for 'make', contextual interview for 'say', and observation for 'do'. 6 participants responded to our contextual interview and we observed more than 20 pet owners during the observation and digital ethnography. We gained insight into the existing pet owner community's pain points and a deeper understanding of what pet owners need from the community by connecting with our target users and analysing the results. These insights will be used to improve our subsequent designs to help more pet owners get involved in their communities and receive effective long-term support from the communities.

3.1 Contextual Interviews

We developed open-ended questions about the pet owner community as shown in Appendix, focusing on the overarching question of how to get long-term support from the

pet owner community. It is worth noting that not all of the participants were pet owners who were already involved in the pet community; interviewing non-participating owners will help us gain more insight into why they are hesitant to join the community or why they choose to leave it, whereas interviewing owners who are already involved in the community will provide information about the existing community's pain points and their expectations for the future community.

The user research methods of photo elicitation and mapping were included in the interviews. We used photo elicitation at the start of the interviews to help participants become more enthusiastic and comfortable with our questions, while mapping helped us learn more about the size, popularity, and other characteristics of the existing pet owner community.

3.1.1 Participants.

A total of six participants participated in our interviews as shown in Table 1, all of whom owned at least one pet. Two of the participants were from online pet community platforms and four of them were from people close to us who owned pets. The participants included Australians and Chinese. Interview Ethics Forms were sent to the participants after sending them an interview invitation and obtaining consent, and the interviews were conducted through a combination of Zoom and Miro, which were convenient and easy to record. Among the six participants, only two gained close friendships through their involvement in the pet owner community, while the remaining four only communicated with the pet owner community when doing product purchases or volunteering with stray animals.

3.1.2 Photo Elicitation.

Photo elicitation served to lighten the mood at the beginning of our interviews and to bring us closer to our participants. In this activity, we asked participants to share the photos of their pets and the stories behind the photos, as well as photos of them interacting with their pets or joining community interactions, to help us get a sense of their pets' daily activities with their owners and what they might do after joining a community. Most of the participants felt more open and free to answer our follow-up questions after the photo elicitation and alleviated any awkwardness that may have arisen during the

Table 1. Participants information.

Participant ID	Gender	Pet Breed	Ethnicity	Community
A	Female	2 cats	Australia	/
B	Female	1 dog	Australia	Stray dogs Association
C	Male	1 cat	China	/
D	Male	2 ferrets	China	Customer group organised by the pet store
E	Female	2 cats, 2 dogs, 2 guinea pigs	Canada	Discord
F	Female	1 dog	China	Instagram

interview. In some of the interviews, the interviewers also asked unplanned questions based on the photos shared by the participants to get more information.

3.1.3 Mapping.

The Mapping method was applied to the exploration of existing pet owner communities. Participants were asked to write down and connect the existing communities they knew or they were already in, and to express their degree of satisfaction with the community by changing the block size. The reason why they liked/ didn't like the community was also asked to further understand the pain points of these communities as well as the user needs of their ideal community.

3.2 Digital Ethnography

Through the above research, we found that most of the users we interviewed were actively taking part in online communities rather than communities in real life. In order to gain a more comprehensive understanding of online pet owner communities, we combined digital ethnography to conduct an observational study of several online communities. Digital ethnography requires researchers to immerse themselves in the relevant online platforms and inconspicuously observe users' interactions on these platforms as a way to generate a general understanding of the relevant communities. Through postings,

Table 2. Digital ethnography data.

Platform	Community	User Needs	URL
Reddit	Dogs	General community about everything of dogs	https://reurl.cc/lZdRKj
Reddit	Rover Pet Sitting	Find someone to take care of their dogs	https://reurl.cc/zrze97
Reddit	Pets who make you aww	Cute photos/videos about pets	https://reurl.cc/DX6g5d
Facebook	1 million pets lover	General community about everything of pets	https://reurl.cc/MXdAKk
Facebook	Lost and Found Brisbane	Lost and found the pets in Brisbane	https://reurl.cc/NG6r8k
Facebook	Pets in Need Australia	Adopt/Foster/rehome pets in Australia	https://reurl.cc/DX6gQE
Discord	Reptile Zoomers	General community only for reptile zoomers	https://reurl.cc/VRXEOR
Discord	Dogs of Discord	Cute emotes of dogs sharing	https://reurl.cc/de5Gkg

conversations, and QA posted by users in the relevant communities, we summarised several needs and expectations of users for online pet owner communities. The platforms we viewed and observed are shown in Table 2.

3.3 Observation

In the above research approach, we focused mainly on online pet owner communities and lacked insight into real-world pet owner communities, so observations in the real world would fill the gap in that research and help us analyse the needs of users in real-world communities. During our observations, we focused on the interaction between pets and

owners, pets and other pets, and pet owners and other pet owners, as well as the relevant facilities and possible problems that exist in the place.

3.3.1 Environment.

The main sites we did observation in were Milton Dog Park and Coolum beach, Sunshine Coast as shown in Fig. 1. The former is a tailor-made space for dogs with more complete pet-related facilities, such as fences and excrement bags, while the latter is a resort site with a more complex environment and crowd.

Fig. 1. Functional area division of Milton dog park.

Milton Dog Park was divided into a small dog area and a general area by fence, where the general area was accessible to both small dogs and other dogs, which could be interpreted as a protection measure for small dogs. In addition to this classification, there was also a distinction between excretion areas and non-excretion areas, where dogs were only allowed to excrete in the excretion areas. However, regardless of the area, excretion bags were provided and owners are required to clean up the excrement in any area. In Coolum beach, there are no pet-related measures.

3.3.2 Interaction.

In total, we observed 12 owner-to-owner interactions at the observation sites, all of which occurred under the premise that their pet was interacting with each other. There were 6 instances of simple nods between owners, 2 instances of no communication, and 4 instances of prolonged chatting. However, we did not observe any behaviours such as exchanging contact information that had the potential for their future long-term communication. At the same time, we found one incident in which the pet was so excited and barking that the owner was unable to stop it and had to pull it away, and one incident in which the owner had to pick up the pet when crossing the street because it was too scary.

4 RESULTS

4.1 Motivation for joining the pet community

From the participant interviews, we started to improve our understanding of pet owners. We unveil why the pet owners join the community by interviewing the participants, coding the contextual interviews, and analysing the data from the internet.

4.1.1 Entertainment.

Firstly, the data from digital ethnography exposed that fun is the reason for the users to join the community. Lots of communities on social media are about entertainment. 1M Pets Lover is a group on Facebook, the pet owners usually share their pet's funny videos. On Pets Who Make You AWW, the pet owners share videos about their pets' special skills. Keeping A Grocery Store Lobster As A Pet is a series on YouTube. Lots of pet owners discuss these videos in the chat room. Additionally, participant B from contextual interviews stated:

"I often look at funny animal things on YouTube."

meaning that the users are willing to join the community for fun. Participant C from contextual interviews mentioned:

"I will browse the KOL's posts about pets on social media regularly."

This participant also expressed that being amused is the purpose of accessing pet information. Accordingly, entertainment is the significant factor that drives pet owners to join the community and access information about their pets.

4.1.2 Seeking Support.

The other reason that pet owners join the community is to gain support. Rover Pet Sitting is the group on Reddit. The pet owners can post their questions in this group. Pet Beauty is an account on Instagram it provides pet service for the pet owner. Lost and Found Pet Brisbane helps pet owners find their pets if they are lost. From the interviews, participant D mentioned:

"I will go to the park with pet owners they knew and share the information with each other."

meaning that gaining information about supporting pets is significant for pet owners. Participants F from contextual interviews indicated:

"I want to learn about training my pet so I join the pet training club."

in order to absorb the knowledge about training pets, this participant chooses to find the relevant community and join it. Apparently, gaining support is one of the significant reasons that joining the community.

4.1.3 Seeking Recommendation.

During the raising process, pet owners often need to purchase a variety of products for them, such as dog food, snacks, toys *et al.* During contextual interviews, participant A from contextual interviews mentioned:

"I sometimes search for pet food and toy recommendations online, and there is a small group

chat organised by the pet store, I will ask questions in that chat. "

meaning that they often seek recommendations from others to purchase new products for their pets. Useful products can somehow improve the quality of their pets' lives and reduce the risk to their pets in their daily life. And sometimes cheaper products can be bought if there are more pet owners participating in the purchasing.

However, when purchasing pet supplies, some participants also said that the recommendations they received were not always true, and the product they purchased may be less effective than expected. Participant C mentioned:

"Some information content is not concise and there are advertisements to promote."

Besides, local pet-friendly attractions such as cafes, campgrounds *et al.* are often shared among the pet owner community. Participant D from contextual interviews mentioned:

"Yeah I learned about pet friendly cafes, natatorium, campgrounds on Google map and some are recommended by fans on Ins."

She was keen to find these attractions and take photos of her pet, which often originated from recommendations from online friends.

4.1.4 Social Network.

We heard very few responses about making friends, with only one participant stating that she had become good friends with her pet's parent's owner and would get together with other pet owners on weekends. This participant also mentioned that she felt pride and satisfaction when hearing someone else compliment her pet.

"Kaia's parents' owners are now friends of mine. They allowed me to adopt Kaia for free after visiting my family and background and required me to accept a return visit."

However, some participants were adamant that he would not become close friends with them. Participant A reported that:

"I will not maintain my relationship with strange people because some of them are weird."

meaning that uncontrolled environment reduce the owner's willingness of participating the community to make new friend. Furthermore, the remaining majority of participants felt that the pet owner community does not bring them new friendships.

4.2 Pain Points

4.2.1 Uncontrolled Environment.

Whether discussing online or offline communities, results indicated that an uncontrolled environment was the reason for many participants disliking certain communities. Due to the uncontrolled environment, dog parks and beaches are seen as unsafe. Participant A mentioned that:

"I avoid dog parks because some dogs are aggressive and dangerous."

meaning that the pet's personality is one of the factor that make the environment be uncontrolled. The pet owners are not able to control other people's dogs and not knowing whether they would bite or attack the participants own dog. Furthermore, people had contradicting opinions as some people liked the communities and were able to form connections, as discussed earlier. some people found the environment was not ideal as they did not have control over the types of people that were active in the communities. Participant B mentioned that

"... but I would not hang out with them because some of them are strange."

This shows that some people have hesitations about joining communities for a long period of time. Building close relationships and strong connections with people of different personalities may be too difficult. This may be because members in online communities

can be from different cultures and environments, causing their personalities to clash with each other.

4.2.2 Information Quality.

Information quality refers to the reliability, depth, and clarity of the information received and discussed within these communities. Information from friends and family was generally seen as reliable. However, participants had altering opinions about whether the other pet communities they have participated in have been misleading or helpful to them.

As discussed earlier, some participants found the amount of information on social media sites to be helpful. However, through literature reviews, it was found that the quality of the information on social media sites is up for debate. Some individuals had similar ideals, referencing "bad TikTok trends" and "pet scammers" (Participant F). Another issue with social media sites was that popular, eye-catching, posts garnered many replies and comments discussing all of the information which allowed users to get a more holistic view of the answers to their questions. However, less popular posts garnered potentially no replies or replies with little, and less informational answers which were not seen as helpful to users. Additionally, information from certain social media sites was seen as helpful whereas information from others was not. While discussing YouTube, participant E mentioned:

"Not informational, just to look at funny animal things".

The information provided by online and offline pet stores was seen as questionable by some. Some participants believed that pet stores "only have information required to sell their lower quality products" and did not have information that was actually beneficial for the health and safety of their pets (Participant C). However, much like pet stores, participants thought that pet adoption was less helpful as "information is difficult to access" (Participant A).

5 INITIAL DESIGN CONCEPT

In response to the shortage of unstable pet owner community environments, we hope to design useful systems that will help pet owners keep better tabs on their own and others'

pets while participating in events as shown in Figure 2. During the tutorial activity, we propose Ouah Ouah Friends – an AR system to realize the function.

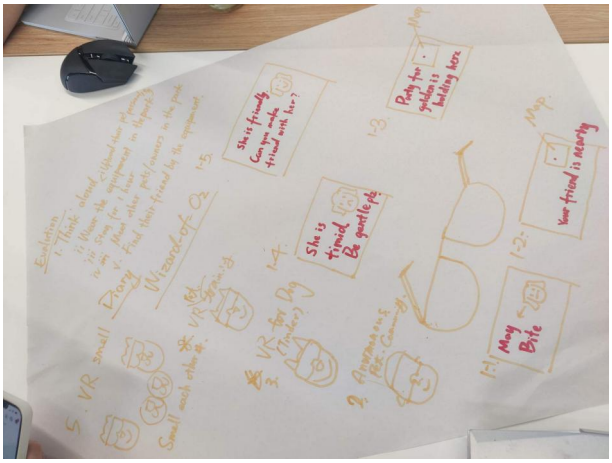

Fig. 2. Ouah Ouah Friends System.

5.1 Uncontrolled Environment Issue

First of all, due to differences in the personalities of pets, some pets want to be close to others, while some timid pets want to stay away from the group, and in addition, aggressive pets may hurt others. Therefore, in this system, we want pet owners to judge the personality of another person's pet as quickly as possible when they see it and decide how to deal with it: should they let their pet get close to it or stay away from it? Then, before going for a walk, the pet owners can update their pets' personalities and moods; this way, when other owners meet their pets, their AR glasses will scan the pet and tell them the information as shown in Fig. 3.

Besides, the system helps pet owners make friends and connect with each other in a much easier way, without telling others their detailed information like telephone number or real name as shown in Fig. 4.

After becoming friends with each other, the pet owners can find their friends' location if they are in the same dog park; however, when they leave the park, detailed information, such as their home address, will be kept from others. Through the AR application, pets'

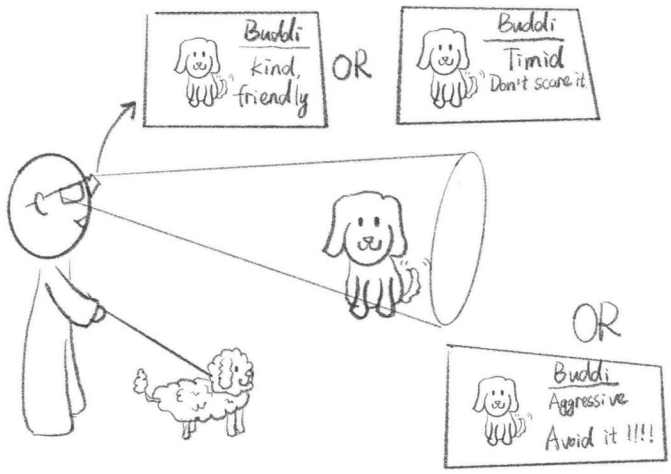

Fig. 3. Pets personality recognition.

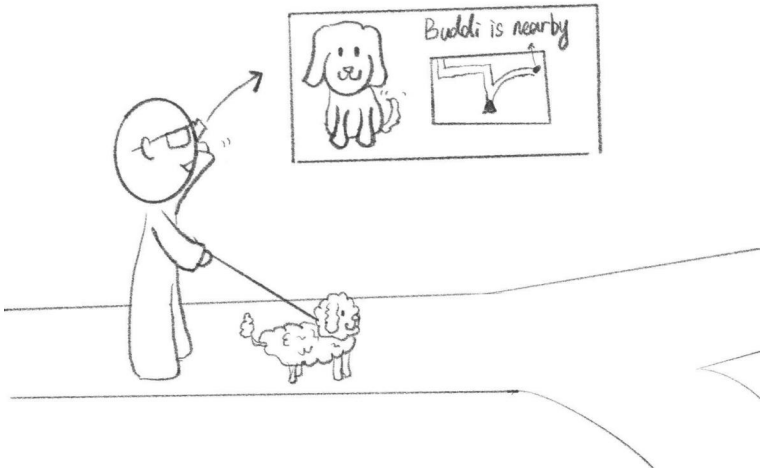

Fig. 4. Friends application.

owners can be connected with each other in a more stable environment, as well as protect their privacy when making friends with others.

5.2 Information Quality Issue

To improve the information quality that pet owners get from their daily life, the AR glasses can scan the information they are reading and identify the authenticity of it. When reading

the adoption information, the AR glasses will search the photos online to identify if the photos are copied online as shown in Fig. 5. In this way, the owners are able to decide whether or not to believe in the adoption information and get contact with the poster.

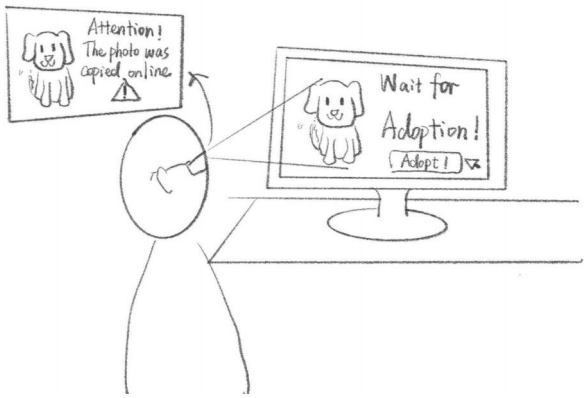

Fig. 5. Friends application.

The owners can also put their attitude on the information they are reading to remind others who are not sure about the information's authenticity as shown in Fig. 6. More users' engagement from all over the world can improve the information discrimination ability of novice pet owners as well as the quality of online information.

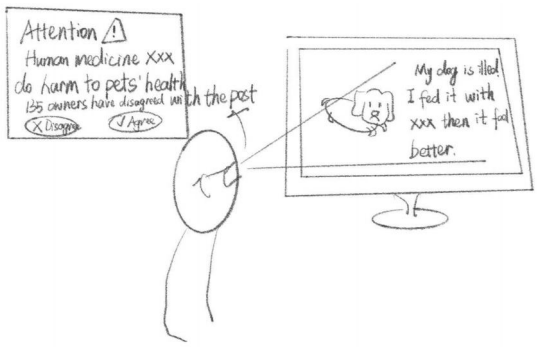

Fig. 6. Information determination.

6 DISCUSSION

6.1 Critical Analysis of Findings

Through this research, we found what users commonly value more in pet communities and which communities are less valuable to them. We were able to understand what users need from pet communities and what attracts them to pet communities. The findings have allowed us to see the contexts in which users use pet communities. Insights can be drawn into how these findings may help people maintain user viscosity on social media platforms to sustain long term relationships.

For socialization purposes, the mapping data and interviews show that our participants prefer to most frequently communicate through online communities that consist of a small, close group of people. Whereas larger communities are used briefly to search for information without much follow up communication or personal discussion. This is in line with the social viscosity enhancement model which states that segmenting large communities into smaller ones increases social viscosity [2].

From our findings, the need for pet communities can be divided into categories including socialization and entertainment. Previous literature has shown the need for building relationships and tele-medical assistance. Participants less commonly discussed pet friendly facilities during contextual interviews. However, large communities of pet owners were found through observations. Thus, we should have found a way to look at interactions in the remote medical assistance community. This is a niche field that the current findings were not able to uncover relevant data on. This may be because pet owners do not know about tele-medical support for pets, it is not commonly available, its cost is too high, or their pets do not need medical assistance however this is unlikely. However, tele-medical assistance was not discussed as it was not used by the research participants. Digital ethnography failed to uncover people discussing or seeking advice about remote medical assistance, despite there reoccurrence of “vet” in many posts. Perhaps a different research method would be better suited to discover information about the remote medical assistance seeking community.

Misinformation can repel users from the online communities [3]. Most participants did not recall being misinformed about pet information through online communities. However, this research is not able to fact check all the information they had discovered through

pet communities. Regardless, participants did not seem averse to any communities due to misinformation.

Family and friends were the most frequently used offline communities. These communities have the highest factors of cohesiveness which define a sense of community as defined by McMillan and Charvis [7]. The frequency of these was followed by small online groups.

Pet owners were found to socialize in pet communities for the purposes of entertainment, seeking support, making friends, acquiring pet information, and acquiring product recommendations. The communication patterns differ across these socialization categories. Trying to satisfy these social patterns in the community optimization design should be considered in future designs. Creating a community atmosphere for each purpose can be suitable for optimising and designing social mechanisms. On the other hand, we can create specific community atmospheres through creating a targeted design for a particular socialization category. The viscosity of such a community with a vital purpose might surprise us, and it can be our future observation subject.

6.2 Implications for Future Design

Although the motivation for users to join the community is not the same, what users experience in the community is generally similar. They get some common experiences and information from the community. These meaningful experiences and information are essential factors in maintaining their activity in the community. In our survey, uncontrollable environmental factors and spotty information affect users' stay in the community. The uncontrollable environment is, to some extent, the consequence of uncertainty caused by the lack of adequate information. We could use the technology to make the community environment more controllable and knowable. It is our design opportunity.

In our initial design concept, we use AR technology to increase access to information, thus controlling the environment. We also use the more available access way to the information to tag and show the information quality helping users from bad information in the community. We designed the AR glasses to be useful for both online and offline communities. However, in many cases, we just increase access to information without any regulation of the production of information. We control the environment with

more information. It may increase the amount of information processing for community members.

For the online community, the artificial intelligence algorithm mentioned in the literature review can be used to organize and control the community content. Algorithms allow authoritatively verified information to gain greater exposure, thereby suppressing and reducing the production of low-quality and invalid information.

For offline communities, the display priority of information can be designed to optimize the display of information to make it practically helpful for users to handle their current environment, boosting their desire to socialize. Furthermore, it means that a social system can be designed with the help of AR technology to make offline social interactions more transparent and convenient to enhance the social experience and thus keep the community alive.

7 CONCLUSION

In this paper, we aim to help pet owners be connected to have long terms support for their pets. We explore the pet owners' reasons for joining the communities and participating in the relevant activities through conducting diverse HCI methods. First, we conduct contextual interviews to explore the users' pain points. Photo elicitation is one of the contextual interview methods. Since we find out the pet owner is willing to share their pet story, we adopt this method to motivate them to provide insight into the pet community. We also use the mapping method. The mapping method makes the participants draw their connection as the map is down. We believe this method is suitable for researching the relationship between the owners and the community. We also can understand the pet owners' attitudes toward each community. Additionally, digital ethnography has also been adopted. Through this method, we can obtain data about the insights that the pet owner joins the communities.

After evaluating our data, we conclude the reasons and the pain points of the pet owners joining the community. The pet owners' motivations to join the community are for entertainment, seeking support, seeking recommendations, and expanding their social network. The participants mention they usually follow the pet posts and look at funny animal videos on YouTube for fun. Some participants indicated that they joined the training club to seek support. Some participants from contextual interviews mentioned

that they would seek recommendations on social media such as FaceBook. Furthermore, we discover the owners' pain points. An uncontrolled environment is one of the owners' pain points. Some participants indicated that some of the members of the community are strange. The other pain point is information quality. Pet owners worry that the information from the online community is incorrect.

To alleviate the pain points above, we propose an AR system – Ouah Ouah Friends. This system makes the pet owners update their pets' personalities and moods before walking and helps clarify the information the pet owners find online. This design can establish a stable environment for the owners because the owners can keep away the aggressive pet. Ouah Ouah Friends can also provide information about the nearby pet activity and make sure they can provide the correct information.

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A APPENDIX

A.1 Interview Questions

Research Question: How can pet owners be connected to each other to have long terms support for their pets?

Method

a. Photo Elicitation
b. Mapping
c. Digital Ethnography

Photo Elicitation

1. Age, location
2. What pets do you have
3. Can you share some **photos** of your pets? Can you share a **story**? What were you doing in the photo?
4. What **activities** you have done involving your pet? **e.g.** reading articles, posting images/stories/questions, playing with it, going on walks
5. What are some **problems** you've faced with taking care of your pet? **e.g.**, foods it can/can't eat, behavioural issues like anxiety
6. Do you ever **search** for information surrounding pets online?
   a. **What** do you search about, **e.g.** pet health, pet care, funny videos, pet food.
   b. **Where** did you find the information, **e.g.**, Google, YouTube, Reddit, Discord, other social media...
7. Has there ever been some information about your pets you wanted to know but have not been able to find from your current sources?
8. Have you ever found out that some of the information you found about your pets is incorrect? **e.g.,** have all the questions you've had about your pet been answered successfully without any confusion

Mapping

1. Write on sticky notes all of the pet **communities** you know**.** Can be **in-person** communities or **online** forums**. Note**: clarify that they don't have to participate in the community
   e.g., online: reddit, discord, Instagram, Facebook, YouTube, WeChat, 4chan,
   e.g., in person: dog park, pet store
   a. **Size**: change size of the sticky notes based on how often you participate in each community
   b. **Arrow**: draw an arrow from one community to another if your friends from that community are also part of another community
   c. **Colour**: change colour of the sticky note if you've ever used that community to help with your pet problems.
   d. Community questions: write on the map
      i. Why do you **like** the community more than others
      ii. Why **don't you like** the community, why it's worse than others
      iii. How they found the community, why they participate in the community & what they do, e.g. friends, pet care advice

1. Have you **maintained relationships** with other pet owners?
   a. **Yes:** How? What are some activities you do and topics you discuss?
   b. **No**: Why not?

Fig. 7. Interview questions.

A.2 Interview Scripts

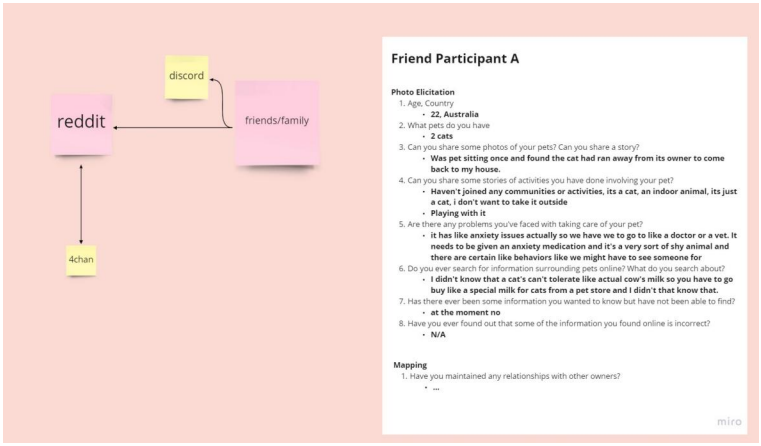

Fig. 8. Participant A.

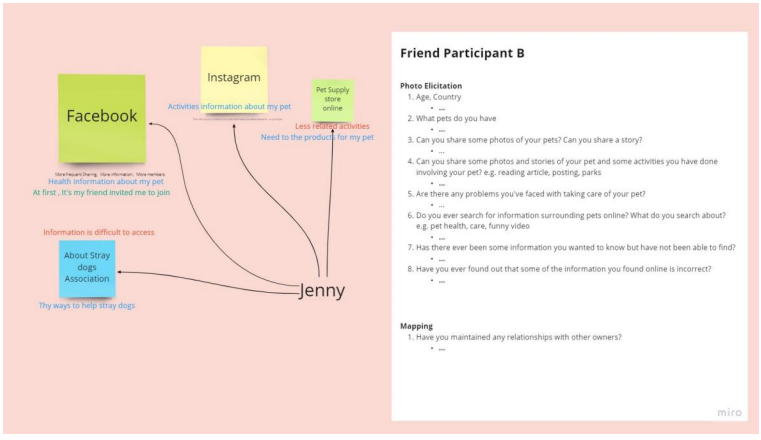

Fig. 9. Participant B.

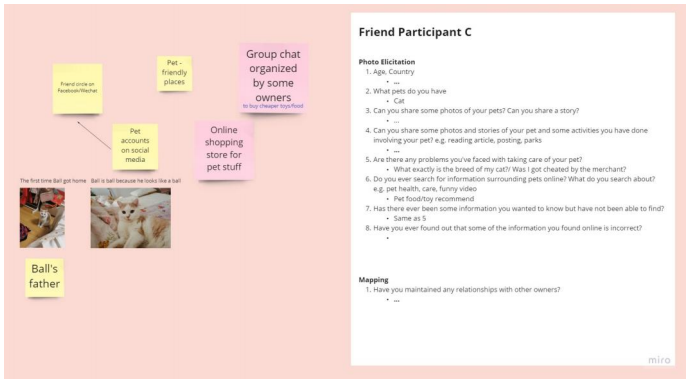

Fig. 10. Participant C.

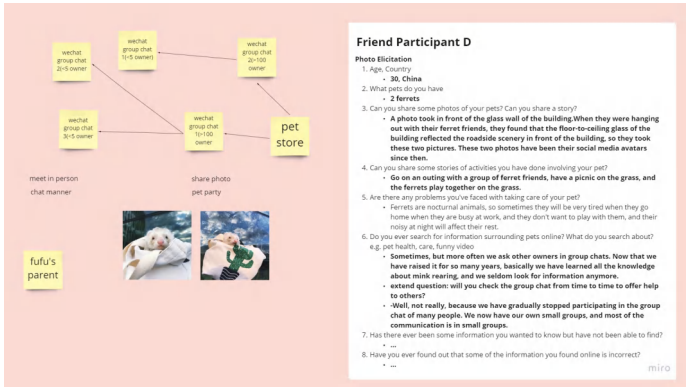

Fig. 11. Participant D.

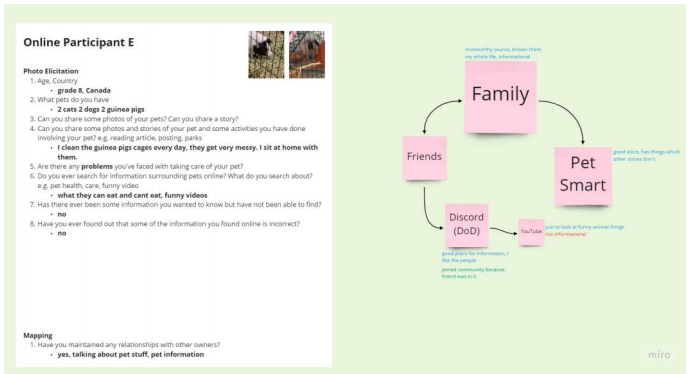

Fig. 12. Participant E.

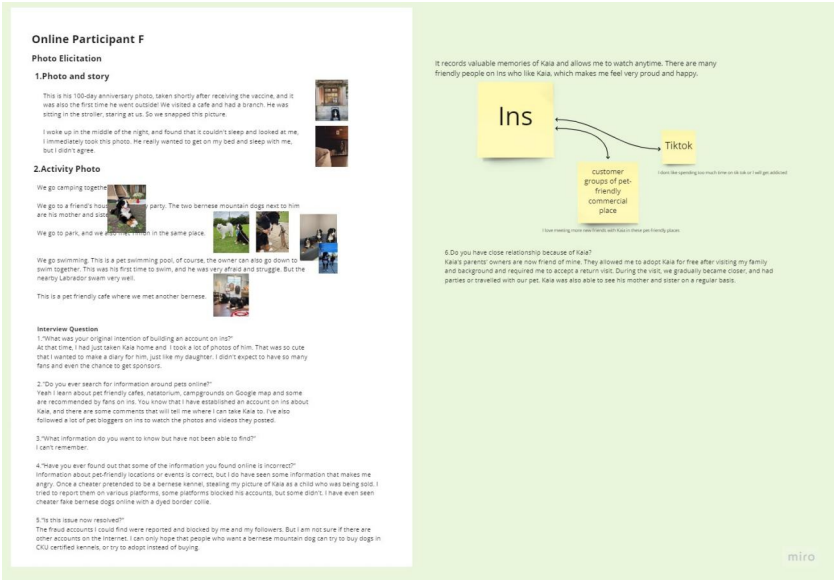

Fig. 13. Participant F.

Fig. 14. Script codes.

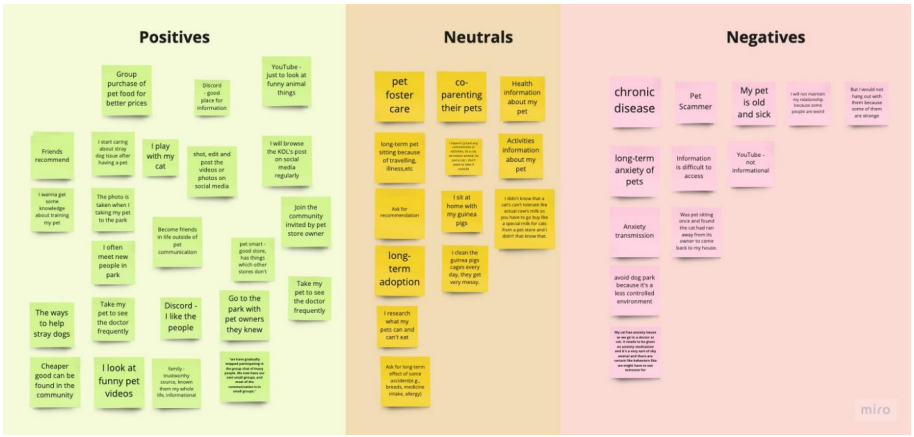

Fig. 15. Affinity diagram 1.

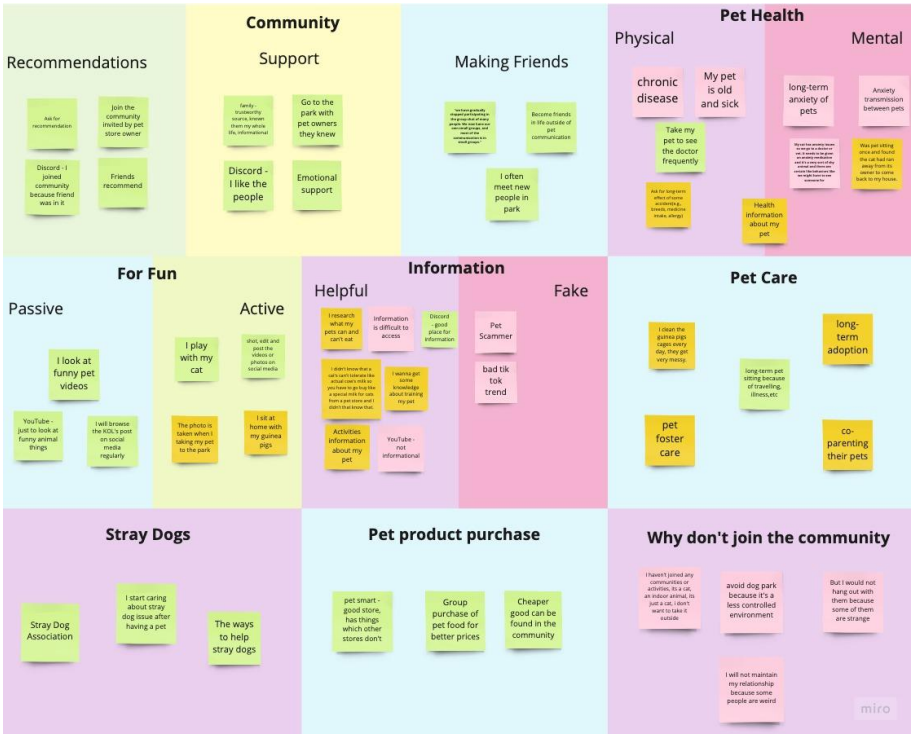

Fig. 16. Affinity diagram 2.

A.3 Observation

Fig. 17. Milton.

Fig. 18. Milton.

Fig. 19. Milton.

Fig. 20. Milton.

Fig. 21. Milton.

Fig. 22. Gold Coast.

Fig. 23. Gold Coast.

A.4 Digital Ethnography

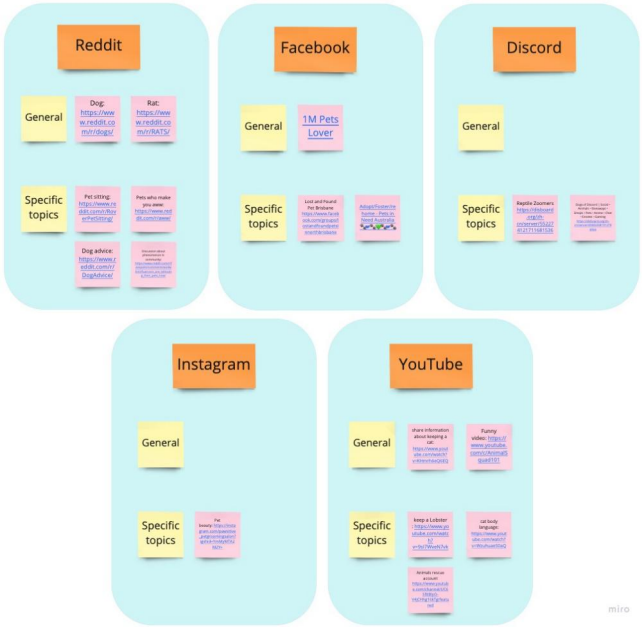

Fig. 24. Digital ethnography data.

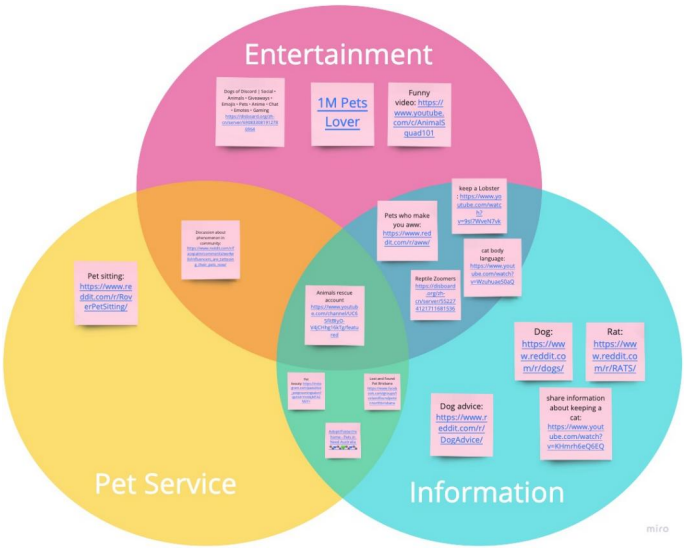

Fig. 25. Digital ethnography affinity diagram.