The Augmentation of Interest in a Community Application for PetHub via Data-Informed Content Recommendations Tailored

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ABSTRACT

In the contemporary era, individuals are actively seeking spaces or platforms aligned with their interests and hobbies. Presently, there is a notable interest in pet-related activities, and we have observed a growing trend in this regard. Recognizing this opportunity, our group is cognizant of the potential to create a centralized platform for the community interested in pets. The PetHub application originated from the collaborative ideas of group members who have developed it further based on their shared passion and interest in pets. The primary objective of the application is to establish a space for discussion and communication, offering a plethora of features for individuals who love and are interested in pets. PetHub aims to go beyond the conventional role of a platform solely focused on pets. It aspires to create a diverse and high-quality community, regardless of whether users are experienced pet owners or general pet enthusiasts. The application seeks to create a space where everyone can connect, share, and learn about pets in detail. With a focus on promoting love for pets collectively, PetHub aims to be a platform for building a valuable community that encompasses people's affection for animals.

CCS CONCEPTS

· Information systems→Spatial-temporal systems; ·Computing methodologies→Machine learning; Knowledge representation and reasoning; Artificial intelligence; Computer vision; Natural language processing; Learning latent representations; ·Human-centered computing →Human computer interaction (HCI) →HCI theory, concepts and models;

KEYWORDS

Subscription, Pet, dogs, cats, Herbs for maintaining the body, Community of animal lovers, modernity, SDGs

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1 INTRODUCTION

1.1. Background

In today's era, people are actively seeking communities or platforms that cater to their interests and hobbies. The growing interest in pet ownership is particularly noteworthy, capturing the attention of a substantial population. Recognizing this trend, we identify an opportunity to fill a void by creating a platform that serves as a central hub for a community of pet enthusiasts. The PetHub application is the result of collaborative ideation among group members who share a passion for advancing the well-being of pets. Our commitment lies in establishing a centralized space that fosters communication and interaction, offering a plethora of features for individuals who love and are interested in pets. A significant pain point we observe is the lack of dedicated community platforms for pet lovers amidst the abundance of platforms catering to various groups, such as matchmaking, job searching, and cartoon enthusiasts. The existing applications mostly serve specific purposes and often lack the community-oriented features desired by the sizable population of pet enthusiasts. This realization motivated us to conceive and develop PetHub. Create a Communication Hub: Establish a space for discussions, conversations, and knowledge exchange related to pet ownership. Cost Reduction through Knowledge Exchange: Facilitate cost savings in pet care by encouraging the exchange of knowledge and providing special membership benefits at reasonable prices. Reduce Pet Mortality Rates: Mitigate the loss of animal lives by offering services such as knowledge dissemination, access to veterinary professionals, and promotion of herbal remedies.

PetHub aims to be more than just a platform; it aspires to be a thriving community connecting pet owners and enthusiasts, fostering a culture of shared love and knowledge about pets.

2 BACKGROUND AND NOTATION

2.1 Theories and Fundamentals

2.1.1 Business Model Canvas (BMC)

The Business Model Canvas (BMC) is a pivotal framework in business strategy and entrepreneurship. It presents an efficient way to create a high-performance business model suitable for presentation and analysis. The BMC is a visual summary format that encapsulates nine key components, enabling executives and teams to comprehend the business's overall structure and align strategies for operational efficiency. The nine components of the Business Model Canvas are:

Customer Segments: Identifying the primary customer groups of the business.
Customer Relationships: Managing and fostering relationships with customers.
Channels: Sales and distribution channels for products or services.
Value Propositions: Unique selling points addressing customer problems.
Key Activities: Core activities essential for business operations.
Key Resources: Critical resources necessary for business operations.
Key Partners: Partnerships contributing to driving the business.
Revenue Streams: Sources of income generated by the business.
Cost Structure: Breakdown of the business's expenses.

The BMC excels in providing a clear and concise overview of the business model, facilitating effective communication and collaboration among team members. Moreover, it aids in recognizing opportunities for innovation. However, it is essential to acknowledge that while the BMC simplifies the business model, critics argue that it may oversimplify certain aspects. In dynamic industries or those heavily reliant on complex technologies, supplementary concepts and principles may be needed for a comprehensive understanding.

2.1.2 Content Recommendations

Content Recommendation, or content recommendation systems, plays a significant role in the digital age across various platforms, from E-commerce and streaming services to news websites and social media networks. These systems use algorithms to recommend products or services that align with the consumer's preferences. The theoretical foundations of content recommendations stem from a variety of continuously evolving concepts and models. Here, we provide an overview of three primary recommendation formats:

Collaborative Filtering: This method recommends items based on the preferences and behaviors of users with similar profiles. It relies on user interaction data and establishes connections between users who share common interests.

Content-based Filtering: This approach recommends items similar to those the user has previously shown interest in. It focuses on the characteristics of items and matches them with the user's preferences.

Hybrid Filtering: A combination of collaborative and content-based filtering, this approach seeks to enhance recommendation accuracy by leveraging the strengths of both methods. It aims to mitigate the limitations of individual filtering techniques.

These recommendation systems are fundamental in delivering personalized and engaging content to users, contributing to a more tailored and satisfying digital experience.

2.1.3 Collaborative Filtering

Collaborative Filtering is a content recommendation system that operates on the assumption that users with similar preferences in the past tend to share similar preferences in the future. Collaborative Filtering can be divided into two main approaches:

2.1.3.1 User-based Collaborative Filtering

This method recommends content to a user based on the preferences or likes of other users who exhibit similar behavioral patterns. The system identifies target users and suggests content based on the preferences of other users with similar patterns. For example, if User A and User B have a significant history of liking similar movies, and User B likes a new movie, the system might infer that User A is likely to enjoy the new movie as well.

2.1.3.2 Item-based Collaborative Filtering

This approach recommends content to users by considering the similarities between items that users have interacted with. The system recommends content that is similar to what the user has liked previously. For instance, if User A enjoys watching the movie "Die Hard" extensively, the system, knowing User A's preference for "Die Hard," may recommend movies with a similar style or featuring the same lead actor.

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2.1.5 Content-based Filtering

Content-based Filtering focuses on classifying the characteristics of content and user preferences. This type of recommendation is made by matching the features of content with the user through a two-step process:

2.1.5.1 Feature Extraction

This involves categorizing the characteristics of content or items and creating feature sets for both users and content. For example, User A may be characterized by preferences such as "Horror" genre, director "Director X," and a preference for movies with a duration of "not exceeding 2 hours." The movie "Movie Y" may be characterized as "Horror" genre, directed by "Director X," and having a duration of "115 minutes."

2.1.5.2 User-Item Matching

After creating feature sets for users and content, the system matches content and users with common features to recommend content that aligns with user preferences.

2.1.6 Hybrid Models

Hybrid models are recommendation systems designed to overcome limitations and enhance recommendation accuracy by combining

Collaborative Filtering and Content-based Filtering. Two main approaches within Hybrid Models are:

2.1.6.1 Model Fusion

This Hybrid model integrates results from both Collaborative Filtering and Content-based Filtering systems to provide a comprehensive and complete set of recommendations. This ensures that the system recommends content that is both diverse and aligned with user preferences.

2.1.6.2 Cascade Model

The Cascade Model is a Hybrid recommendation system that uses one recommendation system as an initial filter and then applies another system sequentially to filter the content further. For instance, using Collaborative Filtering to select content and then applying Content-based Filtering to ensure that the recommended content aligns closely with the user's preferences. These recommendation systems continually evolve and leverage technologies such as Machine Learning and Natural Language Processing to provide high-quality, personalized content recommendations.

2.1.7 Technology Acceptance Frameworks

Technology Acceptance Frameworks are essential tools for understanding and identifying factors influencing the acceptance and adoption of new technologies. In the current digital era, where technology is pervasive in daily life and high-level work, creating user acceptance and usage of technology is crucial. Several frameworks have been developed over time, and here are three prominent ones:

2.1.7.1 Technology Acceptance Model (TAM)

Introduced by Fred Davis in 1989, TAM serves as a fundamental framework for understanding user acceptance of technology. TAM revolves around two primary factors:

- Perceived Usefulness (PU)

PU refers to the individual's belief that using a particular technology will enhance their performance and effectiveness.

- Perceived Ease of Use (PEOU)

PEOU is the individual's perception of how easy or difficult it is to use a particular technology. TAM has been widely used in various contexts and serves as a tool to explain user behavior effectively.

2.1.7.2 Extended Technology Acceptance Model (TAM2)

TAM2, discussed by Venkatesh and Davis in 2000, extends the original TAM by incorporating additional variables to consider social and emotional aspects in technology adoption. In addition to PU and PEOU, TAM2 introduces two more factors:

- Subjective Norm

Subjective Norm refers to social influences or the impact of social factors on an individual's decision to adopt or reject a technology. These factors could include friends and social networks using the technology.

- Image

Image refers to the user's perception and belief regarding the impact of technology adoption on their self-image and social identity. TAM2 provides a more comprehensive understanding of user behavior than the original TAM.

2.1.7 Unified Theory of Acceptance and Use of Technology (UTAUT)

Developed by Venkatesh and colleagues in 2003, UTAUT combines and integrates various technology acceptance models, including TAM. UTAUT identifies four key factors influencing technology adoption:

- Performance Expectancy

This refers to the user's expectation of the performance and benefits derived from using a specific technology.

- Effort Expectancy

Effort Expectancy gauges the perceived difficulty or ease of use when initiating the use of a technology.

- Social Influence

Social Influence represents the impact of social factors, such as peer or network influence, on technology adoption.

- Facilitating Conditions

Facilitating Conditions refer to external factors and support resources that contribute to the convenience of using technology.

UTAUT is a comprehensive framework that considers both personal and social factors in technology adoption, providing a holistic understanding of the user's acceptance and usage of technology. Hybrid Models

3 RESEARCH METHODS

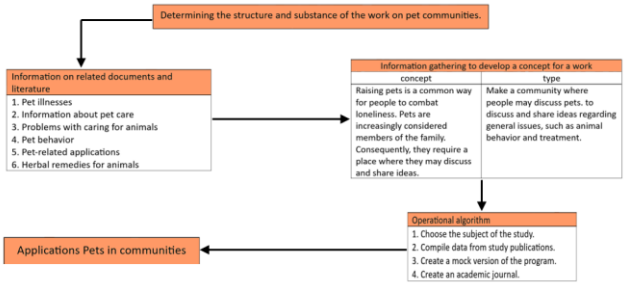

Figure 1: Conceptual Framework

3.1 Hypothesis

3.1.1 Performance Expectancy

The assumption regarding Performance Expectancy includes the expectation of efficiency in using the PetHub Application.

3.1.2 Effort Expectancy

The assumption concerning Effort Expectancy involves the expectation of convenience in using the services provided by the application.

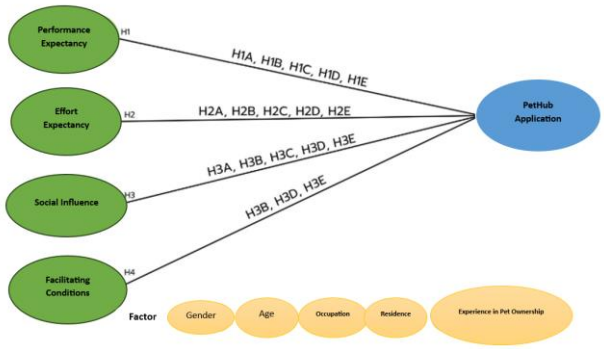

Figure 2: shows the PetHub Application research model, which consists of four assumptions.

3.1.3 Social Influence

The assumption for Social Influence considers the impact of social factors on the acceptance and usage of the PetHub Application.

3.1.4 Facilitating Conditions

Facilitating Conditions are assumed to influence the acceptance and utilization of the PetHub Application. This includes factors such as age, residence, and experience in pet ownership.

3.2 Factors Influencing Acceptance

3.2.1 Gender

The user's gender is considered as a factor influencing the acceptance and usage of the PetHub Application.

3.2.2 Age

The age of the user is assumed to play a role in influencing the acceptance and engagement with the PetHub Application.

3.2.3 Occupation

Occupation is considered as a factor that may influence the acceptance and utilization of the PetHub Application.

3.2.4 Residence

The user's place of residence is assumed to have an impact on their acceptance and engagement with the PetHub Application.

3.2.5 Experience in Pet Ownership

The user's experience in pet ownership is considered as a factor influencing their acceptance and usage of the PetHub Application.

3.3 Factors Contributing to Expectations

3.3.1 Performance Expectancy

Performance Expectancy, including gender, age, occupation, residence, and experience in pet ownership, has an impact on the acceptance and usage of the PetHub Application.

3.3.2 Effort Expectancy

Effort Expectancy, incorporating gender, age, occupation, residence, and experience in pet ownership, influences the acceptance and utilization of the PetHub Application.

3.3.3 Social Influence

Social Influence, considering gender, age, occupation, residence, and experience in pet ownership, contributes to the acceptance and usage of the PetHub Application.

3.3.4 Facilitating Conditions

Facilitating Conditions, including age, residence, and experience in pet ownership, play a role in influencing the acceptance and utilization of the PetHub Application.

4 RESEARCH RESULTS

4.1 Statistical Data Analysis

4.1.1 Demographic Overview

The research gathered data from a sample group of 400 individuals, with the majority (89.25%) being students. The survey primarily targeted individuals within academic circles, particularly those in the sample residing in Bangkok (85.25%). Most respondents (92%) lived in houses, while only 7% resided in condominiums. Regarding pet ownership experience, the majority (49%) had 1-2 years of experience.

4.1.2 Pet and Owner Behavior

Analysis of pet and owner behavior revealed common issues, with a significant proportion of respondents reporting problems such as disobedience (80.75%) and food destruction (82%). Other issues, like defecation outside designated areas (30.75%) and aggression towards people or other animals (29.75%), were reported at lower frequencies. Interestingly, a considerable portion (66.25%) expressed disinterest in using herbal remedies for their pets.

4.1.3 User Expectations - Performance and Effort

Performance Expectancy, the data on Performance Expectancy indicated a moderate overall satisfaction level, with no specific aspect standing out. However, certain elements received lower scores, potentially reflecting a mismatch between user expectations and the application's actual performance.

4.1.4 Effort Expectancy

Effort Expectancy showed a high level of satisfaction among users, although certain aspects related to the variety of service channels scored moderately and demonstrated relatively low preferences.

4.1.5 Social Influence and Environmental Support

Social Influence scores were generally low, especially in terms of the application's overall social impact. The image perception element scored particularly low (2.1325), indicating a need for improvement. However, pet-related aspects scored relatively higher (around 3.6), reflecting greater satisfaction.

4.1.6 Facilitating Conditions

Facilitating Conditions exhibited a wide range of scores, from relatively low scores for pet care convenience (2.41) to high scores for ease of registration (4.9625). Standard deviations were notable, indicating a considerable spread of opinions, especially in areas such as ease of registration.

4.1.7 Overall Statistical Summary

The overall average scores across sections showed a consistent moderate to high satisfaction level. Notably, user satisfaction was highest in the category of service convenience (3.86) and lowest in social influence (3.08). Variability was observed, with the lowest-rated item being Performance Expectancy, specifically the second response option. However, other sections scored 3 or higher, indicating a generally positive perception.

These findings provide valuable insights into user perceptions, expectations, and areas for potential improvement within the PetHub Application. Further analysis and strategic adjustments based on this feedback can enhance user satisfaction and application effectiveness.

5 CONCLUSION

Upon analyzing the personal information of the 400 survey respondents, who are pet enthusiasts, it was observed that the majority were females, constituting 61.25% (245 individuals), while males comprised the remaining 38.75% (155 individuals). In terms of age distribution, 85% (340 individuals) fell within the 21-30 age range, followed by 10.5% (42 individuals) in the 31-40 age range, and 2.5% (10 individuals) aged 40 and above. Occupationally, 89.25% (357 individuals) were students, 6% (24 individuals) were private employees, 4% (16 individuals) were engaged in private business or trade, 0.5% (2 individuals) were government employees or state enterprise workers, and 0.25% (1 individual) identified as homemakers. Regarding housing, 59.5% (238 individuals) resided in single-family homes, 33.5% (134 individuals) in commercial buildings or townhouses, and 7% (28 individuals) in condominiums. In terms of location, 85.25% (342 individuals) lived in Bangkok, 10.5% (42 individuals) in Pathum Thani, and 4.25% (17 individuals) in other provinces. In pet-owning experience, 49% (196 individuals) had 1-2 years of experience, 35.75% (143 individuals) had 3-4 years, 13% (52 individuals) had more than 5 years, and 2.25% (9 individuals) had less than 1 year. The majority of respondents had experience with cats (84.3%), followed by dogs (68.5%), while a small percentage had experience with other types of animals (0.5%), and 0.25% had

no experience with any type of pet. Analysis of Pet Behavior Data.Upon analyzing data related to pet behavior, it was found that the primary issue faced by pet owners was destructive behavior, with 82% (328 individuals) reporting this problem. Other prevalent issues included disobedience (80.75%), excessive noise (32.75%), failure to defecate in designated areas (30.75%), aggression towards people or other animals (29.75%), and creating noise at inconvenient times (15%). Additionally, 33.75% (135 individuals) expressed interest in herbal remedies for pets, while 66.25% (265 individuals) were not interested. Regarding interest in herbal pet food or products, 55% (220 individuals) expressed interest, while 45% (180 individuals) were not interested. Analysis of PetHub App Satisfaction Survey Data. The analysis of the PetHub app satisfaction survey data, based on the Unified Theory of Acceptance and Use of Technology (UTAUT), revealed the following findings: Performance Expectancy: The overall mean score was 3.1315, indicating a moderate level of satisfaction with the app's performance. The mode was 2, suggesting that respondents generally had low interest. Effort Expectancy: The overall mean score was 3.86, signifying a moderate to high level of satisfaction with the app's ease of use. The mode was 4, indicating that respondents were generally highly interested in the app's convenience. Social Influence: The overall mean score was 3.08, suggesting a moderate level of social influence satisfaction. The mode was 3, indicating respondents had moderate social influence satisfaction. Facilitating Conditions: The overall mean score was 3.569, indicating a moderate to high level of satisfaction with the environmental conditions supporting technology use. The mode was 5, signifying those respondents perceived the facilitating conditions to be high.

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