Project Scenario: "FindMyPet" - A Digital Pet Recovery Service

Brief Description: FindMyPet is a mobile application that helps pet owners locate lost pets using crowd-sourced GPS tracking and instant alerts. Users can also register their pets, store medical records, and receive tips for pet care.

Purpose: To reduce the number of lost pets and streamline the recovery process using community engagement and technology.

Stakeholders:

Pet Owners: Individuals wanting security for their pets.
Veterinary Clinics: Professionals who can offer medical aid and advice.
Developers: Team in charge of app functionality and user experience.
Animal Welfare Organizations: Groups interested in protecting animal welfare and supporting pet owners.

Background Information: Increasing pet ownership rates and urban sprawl have led to more cases of lost pets. FindMyPet harnesses the power of community and technology to provide a timely and effective solution to this growing problem.

Description of a similar existing product:
Gathering GPS signals and calculating location takes power, so GPS receiver chips cannot be inserted into low power devices such as trackers and safety pendants. That means that when it comes to tracking someone's location for safety reasons, such as search and rescue situations, only those with GPS-enabled devices that are within range and have sufficient battery life have a hope of being picked up via GPS. When the Power of the Crowd is applied to GPS, the community's collective devices can be leveraged to fill in the gaps. Those without smartphones or whose phone battery has died can still be tracked with some help from the crowd. In a Crowd GPS system, certain low power devices without traditional GPS capabilities can also be tracked.

These devices emit a RF (Radio Frequency) signal uniquely identifying the device by emitting its ID. Now the crowd can come to the rescue. When a smartphone with an accompanying safety app comes into contact with this ID, it uses its current location and then sends this ID, along with its location, to the central server. The central server now has the device ID and its precise location. This creates a crowd based GPS solution that enables non-GPS devices to be located. It is important to note that if the device is not in proximity to any participating smart phone, it will not be located. This is why the breadth of the community is important to the success of a Crowd GPS network.

Element	Relevant stakeholders	Pros	Cons	Priority/Type
Crowd-sourced GPS tracking	Pet Owners Developers			High priority
Instant alerts	Pet Owners Developers	Easier to find a lost pet if you know where they are at the exact time they're spotted.	Possibly harder to implement, since we have to make sure notifications are sent instantly, with 0 delay.	High priority Non-Functional
Pet Registration	Pet Owners Animal Welfare Organizations			High priority
Medical Record	Pet Owners Animal Welfare Organizations Veterinary Clinics	Helps registrations/visits to vets		Low priority
Pet care tips	Pet Owners Veterinary Clinics	Helps Pet Owners to take better care of their pets, and provides a way for vet clinics to give advice more easily and user-directed	Can allow users to give misinformation	Low priority
Community feature	Pet Owners Developers	Captivates more track to the app and allows for more interaction between other people and pets		Low priority

<u>Interview</u>
Two people stay with each stakeholder and ask questions.

Questions for stakeholders:

Pet Owners:

1. What kind of information don't you want to public display on the app about your pet?
2. What level of control would you need over sharing your pet's data with other users?

3. Have you ever used any other app like this? If yes, what did you like on the app; what you didn't enjoy as much; are you still using the app; if not, why.
4. How much would be a reasonable cost for the crowd GPS device?
5. How accurate do you need the tracking to be?
6. Do you expect the app to be really fast or is some waiting time acceptable?
7. What would make this app easy or difficult for you to use during an emergency? (possibly give examples)
8. If your pet is lost, after finding the pet, how do you want to be contacted?
9. How many meters from the pet should a person get notified that it is lost?

Veterinary Clinics:

1. How could we store medical records on the app?
2. What can we implement in the app so that it would be easier for a vet to get access to those medical records?
3. What type of medical data would you recommend being stored in the medical records?
4. Would you be interested in using the app to notify or being notified by pet owners about relevant health alerts?
5. What kind of information can be collected by the GPS records of the pet?

Developers:

1. What technology would you prefer to use to create an app like this? Knowing it has to be used in the latest version of iOS and Android.
2. What kind of limitations would there be with that technology?
3. What are the biggest technical challenges you anticipate in implementing real-time GPS tracking and alerts?
4. How can we ensure the app works efficiently in both urban and rural areas?
5. How should we design the system to scale with increasing users and pets over time?
6. How can we guarantee the security of all the stored data?
7. How do we get a community of connected phones? Is it possible to track through all Android and/or Apple phones (like the AirTag) or do we need a lot of people to have our app?

Animal Welfare Organizations:

1. What would be the best sources to get pet care tips from?
2. What kind of information would you value in the app?
3. Would you be interested in being able to input your own pet care tips?
4. Do you have any concerns regarding pets wearing low power devices?
5. What legal or compliance concerns should we address to ensure the app is suitable for all animal welfare organizations?
6. Are there specific licensing or regulatory requirements we must meet?
7. How do you currently assist in the recovery of lost pets, and how could FindMyPet complement or enhance your efforts?
8. What features or functionalities would you find most valuable in a pet recovery service like FindMyPet to better support your organization's mission?
9. How can we ensure that the FindMyPet app aligns with your goals for animal welfare and protection?

10. Would you be interested in collaborating with FindMyPet to share lost pet alerts and other relevant information with your community?
11. What privacy or data concerns might you have regarding the use of GPS tracking and community alerts for lost pets?
12. How could FindMyPet help streamline communication between pet owners, your organization, and other stakeholders during the recovery process?
13. Would your organization be willing to provide pet care tips or other resources for users of FindMyPet? If so, what kind of content would you suggest?
14. What challenges do you currently face in reuniting lost pets with their owners, and how could technology solutions like FindMyPet help address these challenges?
15. How do you think FindMyPet could support education and advocacy efforts around responsible pet ownership and care?
16. Would your organization be open to hosting or promoting community events, like pet microchipping clinics, in partnership with FindMyPet?

Types of techniques for each stakeholder:

Stakeholders (16)	**Brainstorming**	**Interviews**	**Card Sorting (hand papers at the beginning)**	**Repertory Grids**
Pet Owners (5)	X	X	X	X
Veterinary Clinics (5)		X	X	X
Developers (3)	X		X	X
Animal Welfare Organizations (3)		X	X	X

Pairings:

Stakeholders	Talking	Taking notes
Pet Owners	Rengert	Love
Veterinary Clinics	Diogo	Daniela
Developers	Cláudia	Ricardo
Animal Welfare Organizations	Nuno	Rúben

Repertory Grid
Values: 1-10

	Pet owners	Veterinarians	Developers	Animal welfare Organizations
GPS tracking				
Instant alerts				
Medical records				
Pet care tips				
Speed of the app				
Ease of use				
Reliability				
Security of data				

Workshop:

3-5 minutes: Presentation and split them in groups

- **Opener**:

10 minutes - Individual techniques per stakeholder group

Pet owners - Brainstorming + Interview (?)
Veterinary clinic - Interview + (?)
Developers - Brainstorming + (?)
Animal Welfare Organizations - Interview (?)

10 minutes - Group technique:

- Hand out papers and ask them to write things that were missed in the interviews
- Gather all information and select common points
- Ask them all what they think, tell them to write down their opinion, but if someone has anything important to say they can talk, kind of brainstorming

3-5 minutes: Closing remarks, thanking them for their time etc

- **Closer**:

IMPORTANT LINKS:

Notes Pet Owners

Notes Veterinary Clinics

Notes Animal Welfare Organizations

Notes Developers

ERMS Survey analisys
ERMS Requirements Document

Work Division

Members	Document	Presentation
Love		X
Rengert		X
Cláudia	X	
Nuno	X	
Ricardo	X	
Rúben	X	
Diogo	X	
Daniela	X	

Requirements Gathered:

Functional Requirements (Priority: High)

1. **Pet Registration and Profile Management**
    - **Registration**: Users can register pets, providing details such as vaccinations, treatments, allergies, breed, and medical history.
    - **Profile Fields**: Public and private fields in pet profiles, with visibility controlled by the owner (e.g., medical records visible only to vets).
    - **Appointment Scheduling**: Veterinary clinics can manage appointments through the app.
    - **Pet Identification**: Microchip integration to register pets and ease identification if lost.
    - **Pet Behavior and Condition Questionnaire**: Collect initial behavioral and condition data (e.g., how pets behave around other animals).
2. **GPS Tracking and Notifications**
    - **Real-Time Tracking**: Accurate pet location tracking (10-50 meters), with notifications if a pet leaves predefined zones.
    - **Movement History**: Users can view their pet's movement history, and receive alerts if a pet deviates from its routine.
    - **Safe/Danger Zones**: Users can define zones where tracking can be disabled (e.g., home) and danger zones with alerts if a pet enters them.
    - **Modes/Customization**: Users can set different tracking modes, such as "Home" or "Walk," to avoid false alerts when the owner is not with the pet.
3. **Lost Pet Alerts**

    - **Mark as Lost**: Users can flag their pet as lost, triggering notifications to nearby users, veterinary clinics, and welfare organizations.
    - **Recovery Process**: Veterinary clinics and welfare organizations are notified when a pet is found. The app supports verification of rightful ownership before handing the pet back.
    - **Notifications**: Customizable notifications sent to app users within a certain range, as well as SMS as a fallback option.
4. **Medical Records Access**
    - **Medical Record Access**: Clinics can view and update medical records for registered pets, including health alerts and ongoing treatments.
    - **Health Alerts**: Users receive health notifications about their pet or based on disease outbreaks in nearby areas.
5. **Pet Care Tips and Community Events**
    - **Care Tips**: Veterinary clinics and welfare organizations can contribute pet care tips and host Q&A or FAQ sections (e.g., recommended pets for adoption).
    - **Community Events**: Clinics and welfare organizations can promote pet-related events (e.g., vaccination or adoption drives) through the app.
6. **Accessibility Features**
    - **Text-to-Speech**: Enable text-to-speech functionality to read important alerts or pet information.
    - **Voice Recognition**: Allow users to interact with the app using voice commands for accessibility.

Non-Functional Requirements (Priority: Medium-High)

1. **Performance**
    - **App Speed**: The app must load the pet's location on the map within 2 seconds. Immediate responsiveness is crucial for lost pet alerts.
    - **Notification Speed**: Notifications must be sent with minimal delay (preferably under 1 second) to ensure a timely response when a pet is lost or at risk.
2. **Scalability**
    - **User Growth**: The app architecture must support large user growth without performance degradation (high number of users, pets, and locations).
    - **Modular Design**: Develop the backend with scalability in mind, supporting future feature additions, such as third-party integrations (e.g., adoption agencies, health databases).
3. **Interoperability**
    - **Cross-Platform Compatibility**: Ensure seamless compatibility with both iOS and Android devices, leveraging React Native for easier updates across platforms.
    - **Microchip Database Integration**: Integrate with existing pet microchip databases to simplify registration and lost pet recovery.
4. **Security and Privacy**
    - **End-to-End Encryption**: All sensitive data (GPS locations, medical records) must be encrypted to prevent unauthorized access.

    - **Two-Factor Authentication (2FA)**: Implement 2FA for users to add an additional layer of security during login.
    - **Privacy Settings**: Ensure that GPS data is only visible to pet owners, and third-party access (e.g., veterinary clinics) is only allowed if the pet is marked as lost.
5. **Data Deletion and Compliance**
    - **Data Deletion**: Users must be able to delete their accounts and associated data (including pet profiles and location history), in compliance with GDPR and other regulations.
    - **Retention Policies**: Follow proper data retention and deletion policies, ensuring full data removal from all storage systems, including backups.

Domain-Specific Requirements (Priority: High)

Veterinary Clinics

- **Medical Records Management**: Clinics can manage a pet's medical records, including treatments, vaccinations, allergies, and behavioral information, with proper security and access controls.
- **Health Alerts**: Notify clinics and pet owners of health concerns based on the pet's medical history or geographic disease patterns (e.g., localized disease outbreaks).
- **Appointment Scheduling**: Enable clinics to schedule and manage veterinary appointments through the app, providing a seamless experience for owners and clinics.
- **Lost Pet Integration**: Clinics can report lost pets, input the necessary data, and assist in the recovery process, coordinating with pet owners and welfare organizations.

Animal Welfare Organizations

- **Pet Recovery Support**: Welfare organizations can access the lost pet database to assist in recovery, helping coordinate efforts with owners and clinics.
- **Adoption and Event Promotion**: Promote pet adoption campaigns and vaccination events through the app, as well as provide educational resources for responsible pet ownership.
- **Chip Database Integration**: Use existing pet microchip databases to support the location and recovery of lost pets, enabling a streamlined process for welfare organizations, clinics, and owners.

Pet Owners

- **Control Over Data Sharing**: Owners have complete control over what data is shared with veterinary clinics, nearby users, or welfare organizations. Sensitive data such as medical records, location history, and ownership information are shared only with authorized users.

- **GPS Tracking Customization**: Owners can define specific areas where GPS tracking is enabled or disabled (e.g., home or park), and can customize the alerts they receive based on the pet's location and activity.

Regulatory Compliance & Data Privacy (GDPR Compliance)

- **GDPR Compliance**: The app must comply with the **General Data Protection Regulation (GDPR)** and other relevant data protection laws, ensuring all user data, including personal information and pet data, is processed lawfully, fairly, and transparently.
    - **Data Subject Rights**: Ensure that users can exercise their rights under GDPR, including the right to access, rectify, restrict processing, and object to the processing of their personal data.
    - **Explicit Consent**: Obtain explicit consent from users for collecting and processing their personal data (e.g., pet location data, medical records), especially for sensitive data categories.
- **Data Deletion and Account Removal**:
    - **Account Deletion**: Allow users to delete their accounts at any time. Upon deletion, all associated data (e.g., pet profiles, medical records, GPS tracking history) must be permanently removed from all systems, including backups, in compliance with GDPR's "right to be forgotten."
    - **Pet Profile Deletion**: Users can choose to delete individual pet profiles while retaining their account. This action must ensure the full removal of associated pet data.
    - **Retention Policies**: Implement clear data retention policies where users are informed about how long their data will be retained and what happens to it upon account or pet profile deletion.
- **Data Portability**: Provide users with the ability to download their data in a structured, commonly used, and machine-readable format (e.g., pet profiles, medical records, GPS history) as per GDPR requirements.
- **Security and Encryption**: Ensure all personal and pet-related data is encrypted both in transit and at rest, ensuring protection against unauthorized access or breaches.
    - **2FA (Two-Factor Authentication)**: Implement two-factor authentication for users to ensure additional security for their accounts, reducing the risk of unauthorized access to sensitive data.
- **Privacy by Design**: Incorporate GDPR's "Privacy by Design" principles, ensuring that the app is designed with privacy in mind from the outset, including data minimization, ensuring that only the data necessary for the app's functionality is collected and processed.
- **Transparency and User Consent**: Provide clear and concise privacy notices that explain how data will be used and stored. Obtain informed consent for GPS tracking and medical record access, with the option for users to easily revoke consent at any time.
- **Breach Notification**: In compliance with GDPR, implement a process for promptly notifying users and authorities of any data breaches that compromise personal or pet data.
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