Vet Mashinani – Frequently Asked Questions

Bridging the Gap in Veterinary Services

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General Overview & Vision

1. **What is Vet Mashinani and what problem does it solve?**
   Vet Mashinani is a digital platform that connects rural farmers to certified veterinarians. It solves the problem of limited access to quality livestock healthcare in remote areas.
2. **What inspired this project?**
   The challenges faced by farmers in rural Kenya, especially lack of timely vet services, inspired the idea. We wanted a scalable tech solution that directly supports livestock health and food security.
3. **Who are your target users?**
   Rural and peri-urban livestock farmers, certified veterinarians, and eventually NGOs and government agencies involved in animal health.

System Functionality

4. **How do farmers and vets register on the platform?**
   Users sign up with their credentials. Vets are validated against a CertifiedVet registry before approval.
5. **How does the location feature work?**
   Farmers and vets provide latitude and longitude during sign-up or profile update. We use geopy to calculate distances and match nearby vets.
6. **How are appointments handled?**
   A farmer can request an appointment with a nearby vet. Coins are deducted and distributed to the vet and platform. Notifications are sent to both parties.
7. **How do you notify users of updates?**
   Notifications are stored in the database and retrieved via API. They include appointment status changes, coin transactions, etc.
8. **How does disease prediction work?**
   The system uses a trained Random Forest model. The user selects symptoms, and the model predicts the most likely cattle disease.
9. **Can users update their profiles?**
   Yes, users can update their location to get more accurate vet search results.
10. **What if the platform runs out of coins to reward new users?**
    PlatformCoin acts as the main wallet. If it has insufficient coins, sign-up is halted and an error message is shown.

Authentication & Security

11. **How do you ensure secure authentication?**
    A: Passwords are hashed using Django's make_password() and validated with check_password().

12. **Do you have CSRF protection?**
    CSRF is disabled for API endpoints (@csrf_exempt) since they are accessed via frontend clients which handle headers. It can be re-enabled for production.

13. **How do you prevent unauthorized vet sign-ups?**
    Vets can only register if their email is already listed in the CertifiedVet table, acting as a whitelist.

Architecture & Design Decisions

14. **Why did you choose Django for the backend?**
    Django provides a secure, scalable environment with integrated ORM, authentication, and admin features that accelerate development.

15. **What database are you using?**
    We use MySQL in production for better scalability compared to SQLite which was used during prototyping.

16. **Why is your AI model stored as a pickle file?**
    To avoid retraining on every request and to integrate easily into the Django backend. It's efficient for our use case.

17. **How do you scale disease prediction as new data becomes available?**
    We plan to periodically retrain the model using collected symptom reports and vet diagnoses to improve accuracy.

Financial System (Coins & Wallets)

18. **How does the coin system work?**
Coins are the platform's internal currency. Farmers spend coins to book appointments. Vets and the platform earn coins. Coins can be deposited or withdrawn via wallet.

19. **How are wallet balances managed?**
Users can top up or withdraw cash to and from their wallet. Coins are then bought using wallet balance and vice versa.

20. **What is the coin-to-KES conversion rate?**
A: 1 coin = KES 25. This conversion rate can be adjusted by the platform admin.

21. **Why use coins instead of direct KES transactions?**
Coins allow flexible in-app rewards, promotions, and gamification without tying directly to mobile money APIs.

22. **What prevents a user from withdrawing more coins than they have?**
All coin operations use safeguards. Withdrawals below minimum or exceeding balance are rejected.

User Experience & Interface

23. **What frontend technologies are you using?**
Angular is used for the frontend, allowing us to build responsive, component-based UIs that interact with the Django REST API.

24. **How do you ensure mobile responsiveness?**
Angular Material and responsive grid layouts ensure accessibility on mobile and desktop devices.

25. **Is the disease prediction interface user-friendly for non-tech-savvy farmers?**
Yes, it uses checkbox-based symptom selection and plain-language output.

Performance & Optimization

26. **How do you ensure fast response for vet searches?**
    A: We cache results where possible, filter based on a 50km radius, and only fetch essential vet data.

27. **How is real-time interaction handled?**
    A: While we don't use Web Sockets yet, frequent polling or push notifications can be integrated for real-time alerts.

28. **Do you paginate or limit heavy queries?**
    A: Yes, we plan to add pagination and filtering to avoid performance bottlenecks with large datasets.

Data Validation & Error Handling

29. **How do you handle invalid appointment data?**
    Invalid users, insufficient coins, or bad request formats are caught early and return descriptive error responses.

30. **What happens if a user tries to sign up with a duplicate username or email?**
    The request is blocked with a clear message, and no new account is created.

AI & Machine Learning

31. **What type of model is used for disease prediction?**
    A Random Forest classifier trained on livestock disease datasets.

32. **How accurate is your disease prediction model?**
    Initial accuracy is around 100% on test data. We expect improvement with more data.

33. **How do you handle missing or ambiguous symptoms?**
The model uses binary symptom vectors. If a symptom isn't selected, it's treated as absent.

Deployment & Testing

34. How do you test your APIs?
I use curl commands to manually test endpoints and validate business logic.

35. Is this project hosted online?
Yes, the project is fully deployed:

Frontend is hosted on Vercel

Backend is hosted on PythonAnywhere

Domain was purchased via Namecheap and mapped to the deployed services

This setup enables users to access Vet Mashinani from any device through a custom domain.

36. Do you use version control?
A: Yes, we use Git and GitHub for version control, code reviews, and collaboration.

Team & Project Management

37. **How many people are on your team?**
A: The core development was led by me, but the system was discussed and reviewed collaboratively with academic advisors and peers.

38. **What challenges did you face during development?**
Designing the financial and vet matching logic while ensuring security and scalability was complex.

39. **How did you divide responsibilities in the team?**
A: Responsibilities were divided between frontend, backend, AI model training, and testing/documentation.

Legal & Ethical Concerns

40. **How do you ensure only certified vets are onboarded?**
Each vet's email must exist in a pre-approved CertifiedVet registry, verified manually or by external partners.

41. **What are the data privacy considerations?**
All sensitive user data is encrypted or hashed. Only essential location and contact data is stored.

Future Plans & Scalability

42. **What features are you planning to add?**
Telemedicine video calls, automated disease reporting, and an AI vet assistant for basic farmer queries.

43. **How do you plan to scale this to other regions?**
By partnering with local governments and veterinary boards in other counties/countries.

44. **Can this system be used offline?**
Not yet, but we're exploring Progressive Web App (PWA) options for offline appointment scheduling.

Business Viability

45. **How does the platform make money?**
Through transaction commissions, premium vet listings, and possibly vet subscriptions in the future.

46. **How is Vet Mashinani different from other vet apps?**
It integrates location-based search, AI diagnosis, reward-based economics, and a farmer-friendly interface in one system.

Technical Details

47. **What happens if the AI model file is missing?**
The API returns a 500 error indicating the model file could not be found.

48. **What libraries are used for geolocation?**
We use the geopy library to compute distances between users using GPS coordinates.

49. **How are coins stored?**
In the CoinReward model, which tracks balance per user. Updates are atomic to avoid inconsistencies.

50. **How is the platform's coin economy regulated?**
The PlatformCoin account serves as a reserve to issue rewards and collect fees, acting like a central bank.

Thank you for choosing Vet Mashinani!