Digital Animal Notebook Final Summary

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Digital Animal Notebook is a modernized way of documenting interactions with animals in nature. Users are able to take an image of an animal they've encountered and then upload it to our platform along with a description of it and the location of the encounter. Posts will be displayed in other users' feeds where they will be able to interact with posts by liking them and commenting their thoughts along with any extra information they can provide about the animal. Users will also be able to access our AI identification tools to learn more about an animal that they can't identify themselves.

Unlike some existing platforms like iNaturalist and eBird, Digital Animal Notebook utilizes AI-powered species identification, community-driven conservation features, and allows for posting even when offline. It is available across many platforms, such as IOS, Android, and the Web. Our system plans to utilize cloud services like Google Cloud or AWS, integrated with platforms like Google Maps.

Key stakeholders include clients such as university biology departments, conservation organizations like WWF and National Geographic, and environmental consulting firms. Our platform's projected success is based on the popularity of mobile technology, crowdsourced conservation data, the reliability and widespread demand of AI models like TensorFlow and PyTorch for species identification, and the growing demand for digital environmental education tools.

Digital Animal Notebook must support core user functionalities such as login, photo uploads, offline post creation, and social feed interactions. AI-based species identification will be integrated in our platform, returning results with confidence levels and allowing for the manual identification of animals through the comments of other users. There are many different requirements that stem from these functionalities. For example, users must be able to export post data in CSV or JSON formats for external analysis. The application must prioritize fast response times with post uploads and AI identification expected to be completed within 5 seconds. Regular performance tests will be run to ensure that our system's responsiveness remains competitive with similar apps.

Our platform will maintain 95% uptime. It will also conduct regular backups and encrypt user data both at rest and in transit, ensuring GDPR and CCPA compliance. Failures will not occur more than once per month, and patches for critical bugs will be issued within 1 day of discovery. Developers are the only people who will have access to system code and all accesses will be monitored through access logs. Measures against spam, malware, and other forms of malicious software will be enforced. There will be a one-minute cooldown between posts to avoid some of these things. The user interface will be intuitive and sleek, including customizable aspects to account for accessibility needs. It will also be designed with a nature-themed aesthetic to keep the experience both user-friendly and aligned with the app's conservation focus.

Digital Animal Notebook is made up of multiple core subsystems. Some of these systems include the AI subsystem, the Social Media subsystem, the Database Management subsystem,

and the User Interface subsystem. Each system has a specific purpose such as species identification, running user posts and interactions, taking care of data storage and offline synchronization, and providing an accessible and streamlined user experience. Each subsystem is designed to run independently of others while also communicating through a centralized System Controller. This guarantees smooth operation even in environments with low connectivity.

Data that is long standing and constant, such as wildlife sightings, user profiles, and conservation efforts are all managed through cloud based storage. Offline caching is enabled in order to protect user submissions during low or no internet connectivity. Role based access control is used for managing permissions between moderators, researchers, and regular users.

Multiple risks have been identified, some of which are dependency on third party services like firebase and google maps, possible inaccuracies in AI species recognition, and offline synchronization problems. In order to mitigate these risks, the system design implements redundancy in continuous AI model training and validation, cloud infrastructure, and proactive monitoring of external service changes.

The estimated development and operational cost for the Digital Animal Notebook is approximately $273,000. This includes costs for developers, AI integration, cloud services, security audits, and marketing. Some key technology stacks will be TensorFlow Lite for mobile AI processing, Flutter for cross platform development, and Google Cloud for backend services and database management.

Looking ahead, future versions of the Digital Animal Notebook may introduce features such as Augmented Reality wildlife models to further engage users, promote conservation education, and provide a nature experience through lifelike cutting edge technology. These enhancements, along with planned scalability improvements, will help sustain the platform's growth and keep pace with technological advancements.