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Course: Distributed System and Cloud Computing

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Assignment No 1

Describe a service for a company that you as the CEO is planning to offer to the community scalable, collaboration and Fault Tolerance

Answer

This is a description of a planned service for the African community by the use of a digital Agricultural connect service that connect farmers, buyers and agricultural experts through a simple mobile platform. It is focusing on scalable, collaborative, and fault tolerance design along with a real life situation

Service: Digital Agricultural Connect

As CEO, I plan to launch Digital Agricultural connect, a mobile first decentralized digital platform designed to empower smallholder farmers across Africa by providing real time agricultural data, market price access and financial service will act as a digital cooperative, mitigating traditional supply chain inefficiencies and climate risks

The Key Design principles

Scalability

The platform will utilize a modular, cloud-native architecture that allows people to expand into a new regions and the integration of new features like localized weather forecasting or pest alerts.

Collaboration

Collaboration is the center to the platform value and operation, connecting multiple stakeholders.

Farmer to Farmer An integrated knowledge sharing forum and peer to peer training module will allow farmers to share successful farming technology and method to control the disease

Partnership We will collaborate with agri- tech startups, financial instruction, NGO to offer services like micro-loans, Certified seeds, and extension services directly through the platform

Fault Tolerance: The service must function reliably even in areas where there is poor internet connectivity, which is common across the internet

Redundancy Data will be backed up and mirrored across multiple regional servers to prevent data loss from single hardware failure

Decentralization: Utilizing progressive Web App Technology and SMS integration for critical alerts (like serve weather warnings) primary mobile app internet connection fails

Problem Facing And the Solution Of Digi-Agri connect in the community

.Limited Internet Connectivity

Those of the rural farming areas have a poor internet network. This make it difficult for farmers to stabilized across the digital platform such as crop updates and market information.

Solution

Use offline-first design and cloud synchronization.

The platform can allow farmers to record data offline, and once they get an internet connection, it automatically uploads to the cloud. Also, Using lightweight mobile apps and edge servers helps data use and improve access in low-network areas.

.High Cost of devices and data

Smartphones and mobile data plans are often expensive for small-scale farmers, making it difficult for them to stay connected all the platform features regularly.

Solution

Use cloud-based simple apps and partnerships with telecom providers. The platform can run efficiency on low-cost smartphones and require limited data. Partnerships with mobile companies can offer discounted data free access for farmers.

.Security and Privacy Issues

Without strong data protection and user validation, User data such as farm locations, transaction details and personal information could be at risk of unauthorized access

Solution

Implement end-to-end data protection and security of user validation. User data should be encrypted both in storage and during transmission. Using technologies like SSL/TLS and role-based access control ensures that sensitive information is protected from unauthorized users