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| 404 |
| AH Punjab Reporting  Proposal and Planning |
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# Document Version

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| **Version** | **Description** | **Date** | **Author(s)** |
| **1** | *Created* | *20/09/2025* | *Arshpreet Singh Sidhu* |

# Introduction

## Purpose or What does your application do

To propose a solution for the **AH Punjab Reporting** project, developed by Team 404, to modernize and expand the existing animal husbandry reporting system.

## Team contact information

**Team Name:** 404  
**Supervisor:** Arshpreet Singh Sidhu

* Email: arshpreetmalkana@gmail.com
* Phone: +1 437 669 1720 (text/call only)

**Team Members:**

* Arshpreet Singh Sidhu (815805) – arshpreetmalkana@gmail.com
* Divanshu Arora (815623) – 815623@columbiacollege.ca
* Gurleen Kaur Brar (815787) – 815787@columbiacollege.ca
* Khushmandeep Kaur (815373) – 815373@columbiacollege.ca
* Fatma Ahmed (813644) – 813644@columbiacollege.ca

## Description

This project will replace the legacy Google Sheets based reporting app with a secure, scalable, and modern PWA application backed by SQL. It will support multiple devices, role-based access, faster performance, and stronger authentication, improving reporting for the Punjab Animal Husbandry Department.

# Project Proposal

## Existing System

Currently, the department uses a legacy Android client built on Google Sheets + Google App Script APIs. Limitations include:

* Data stored in Google Sheets (not a real database).
* Plaintext API requests with no secure authentication.
* SharedPrefs used for login storage.
* No draft-saving features.
* Android-only support.
* Increasing delays (up to 900 ms per request in some districts).

**System sequence (current):**  
Admin -> Google Sheets -> Sheets API -> App Script API -> Android client

## Proposed Solution

The new system will:

* Use a secure SQL database instead of Google Sheets.
* Provide **secure login** with JWT + WebAuthn (fingerprint, passkeys).
* Offer a **modern UI/UX** with responsive design (PWA).
* Enable **role-based access** (employee, supervisor, admin).
* Allow users to **save drafts** before submission.
* Generate and download reports in **PDF format**.
* Show performance targets and monthly data in dashboards.
* Provide **notifications and reminders**.
* Support **profile management**.
* Run on any device (desktop/mobile, Android/iOS).
* Be faster and more reliable due to optimized backend.

## Alternative Solutions

1. **Standalone district apps** using the current setup (discarded: lacks statewide integration).
2. **Expand existing Google Sheets system** (discarded: Google Sheets is not designed as a database, causes performance bottlenecks up to 2000 ms/report at scale).

## Technology

* **Frontend:** React (PWA), CSS/Tailwind
* **Backend:** Fastify (Node.js), REST APIs
* **Database:** PostgreSQL
* **Design:** Figma
* **Version Control:** GitHub
* **Task Management:** Trello
* **Deployment:** Docker, hosted on team member’s private server in India
* **DNS & Security:** Cloudflare

## MVP

Minimal requirements for success:

* Modern UI (React PWA interface).
* Secure login with JWT + WebAuthn.
* Role-based access (employee vs supervisor).
* Basic report submission and storage.

## Provide a breakdown of each member’s responsibilities.

* **Arshpreet Singh Sidhu** – Supervisor, Full-stack, Backend & Database lead, DevOps, deployment.
* **Divanshu Arora** – Backend development, Database management, API integration.
* **Gurleen Kaur Brar** – Frontend development (React), testing.
* **Khushmandeep Kaur** – Frontend development (React), testing.
* **Fatma Ahmed** – UI/UX design (Figma, React), frontend support, testing.

**Meetings:** Each member shares updates for 10–15 minutes. Everyone speaks for their work.

## Deliverables

* Working application (PWA).
* Source code (GitHub).
* Deployment and installation on private server.
* User documentation (guide for employees).

# Iteration (Sprint) Plan

The team will follow a **waterfall style single sprint** because requirements are fixed and time is limited.

* **Phase 1 (Design & Setup):** UI mockups in Figma, database schema design, backend setup.
* **Phase 2 (Development):**
  + Backend: Authentication (JWT + WebAuthn), APIs for report submission and retrieval.
  + Frontend: Modern UI, role-based dashboards.
* **Phase 3 (Integration & Testing):** Connect frontend with backend, ensure secure login, test reporting workflows.
* **Phase 4 (Deployment & Documentation):** Deploy app on private server (India), finalize documentation, handoff to client.