# Project Title

Enhancing Park Guide Training and Management: A Digital Solution for Sarawak's National Parks and Nature Reserves

## Industry partner

Sarawak Forestry Corporation

## Introduction

The Park Guide Training and Licensing System for National Parks and Nature Reserves in Sarawak is a comprehensive program designed to professionalize park guiding within Sarawak's protected areas. The system ensures that park guides are thoroughly trained, certified, and licensed to deliver high-quality services to visitors. It not only focuses on elevating the standards of guiding but also emphasizes conservation, protection, and sustainable ecotourism practices. The park guide training plays a crucial role in fostering sustainable practices, enhance visitor experiences, and supporting the professional as well as improve community livelihoods through entrepreneurship.

To further enhance the program, Sarawak Forestry Corporation (SFC) is actively exploring digital technologies that can improve the **training process by fostering a more engaging and informative park guide training experience** and **overall management of the park guiding system**. These digital solutions will streamline the training process, bridge knowledge gaps, and provide continuous learning opportunities for park guides through self learning. By incorporating these technologies, SFC aims to enhance the professionalism of park guides, promote best practices in conservation, and ensure that guides are equipped with the latest tools and knowledge to effectively contribute to sustainable tourism efforts across Sarawak's national parks and nature reserves.

## Problem Statements and Objectives:

**A) Streamlining Park Guide Management: The Need for an Automated System to Improve Efficiency and Compliance**

SFC is currently lack of resources to manage on the park guiding resulting in inefficient of park guide training and licensing system. The current park guide training and licensing management system is heavily reliant on manual processes, resulting in inefficiencies in tracking guide progress, handling registrations, managing certifications, and ensuring timely license renewals. This outdated approach not only limits scalability but also poses challenges in monitoring compliance across diverse parks and nature reserves.

**Objective 1:** Develop and implement a digital management system to automate and streamline the administrative processes involved in park guide training and licensing. By reducing administrative burdens, the solution will enhance operational efficiency, improve compliance monitoring, and support the sustainable growth of park guide management programs.

**B) Addressing Knowledge Gaps: The Need for an Interactive and Accessible Training Platform for Park Guides**

Park guides in Sarawak's national parks and nature reserves face challenges in attending the park guides training physically due to the long duration of the training programme and peak season of the tourism coming to Sarawak. The inflexible of the physical training programme cause some restriction to those who want to enrol as park guide especially income loss as they need to scarify their assignment or the current job in order to attend the training. Besides, the limitation to access current and up to date training materials, resulting in gaps in their knowledge on key topics such as

conservation, biodiversity, and eco-tourism. This lack of continuous and accessible learning opportunities affects the quality of their guiding services.

**Objective 2:** Develop and implement a digital training platform that offers park guides flexible training hours, interactive, engaging, and regularly updated content. This platform will empower guides to stay current with the latest environmental trends, conservation practices, and eco-tourism insights, effectively closing knowledge gaps and elevating the standard of park guiding services.

## Areas of Focus (Must Implement ALL):

**1) Comprehensive Park Guide Management and Interactive Digital Platform**

- Implementation:
    - **Park Guide Management System:** Develop an integrated digital platform for managing park guide registration, training schedules, progress tracking, licensing renewals, and certification management. Automate key processes to improve efficiency and reduce manual work.
    - **Interactive Digital Guidebook:** Create a user-friendly mobile app and website with interactive features like maps, real-time updates, and multimedia content (text, images, videos). Include essential details such as park routes, must-see destinations, wildlife to watch, activities, accommodation options, and a historical overview.
- Outcome:
    - A comprehensive digital system that combines park guide management with an interactive digital guidebook. This centralized platform will streamline administrative tasks and provide accurate, engaging resources for guides and visitors, ensuring efficient operations and enhanced guiding experiences.
- Basic functionalities:
    - Admin role
        - Sign up new park guides, update their details, and keep track of their qualifications and certifications.
        - Set up training schedules
        - Send reminders when certifications need to be renewed.
    - Park Guide role
        - Sign up related trainings
        - Keep track of personal qualifications and certifications
        - Receive notifications from Admin
    - All Users role:
        - Provide interactive maps about park routes, wildlife, activities, and accommodations.
        - Offer essential details like must-see spots, wildlife to watch, and a brief park history for visitors.

**2) AI and Data Science for Park Guide Performance Monitoring and Training**

- Implementation:
    - **Data Collection, Performance Monitoring, and AI-Driven Training Platform:**
        - Develop a unified system that collects visitor feedback on park guides through surveys or rating systems, using basic analytics to track guide performance.
        - Integrate AI to personalize training modules based on individual guide performance and feedback, providing recommendations for further training

on topics like biodiversity, sustainable tourism, conservation, thematic, entrepreneur, legislation and etc.
        - The platform will offer interactive quizzes and assessments tailored to the guide's progress, ensuring continuous learning and skill enhancement.
    - **AI-Powered Identification System for Biodiversity:**
        - Create an AI-driven mobile platform that enables park guides to automatically identify plants and insects during site visits using computer vision and machine learning.
        - Guides will capture photos of species, and the system will provide real-time identification, contributing to educational content and protection of natural resources and resources monitoring.
- Outcome:
    - A unified AI-driven system that enhances park guide training, performance monitoring, and on-site biodiversity education. This solution will improve park guide efficiency by provide personalized learning experiences, and assist in the real-time identification of flora and fauna during site visits, supporting both educational and conservation goals.
- Basic functionalities:
    - Admin role:
        - Collect visitor feedback to track and monitor guide performance.
        - Use AI to personalize training and provide tailored recommendations based on guide performance.
    - All Users role:
        - Develop an AI-powered mobile platform that allows park guides to capture photos of plants and insects, providing real-time identification using computer vision and machine learning.

**3) Cybersecurity Measures for Data Protection**: Implement basic cybersecurity measures to protect sensitive data, such as guide performance records and biodiversity data.

- Implementation:
    - Ensure secure access controls and encryption for stored data.
    - Implement simple authentication methods to protect user data and prevent unauthorized access.
- Outcome:
    - Enhanced security for the park guide management system, ensuring privacy and compliance with data protection regulations.
- Basic features:
    - All platforms:
        - Secure access controls and encryption for protecting sensitive data.
        - Simple authentication methods to prevent unauthorized access.

**4) IoT System for Protecting Endangered Plant Resources**: Implement an IoT-based system to track and protect endangered flora and fauna in national parks and nature reserves.

- Implementation:
    - Deploy IoT sensors (GPS, motion detectors) on rare, protected and totally protected flora and fauna to monitor their status and environmental conditions (e.g., temperature, humidity).

- Set up an alarm system that triggers alerts when unauthorized activity, such as flora and fauna poaching, is detected, and integrate this with a mobile app or web platform for real-time monitoring by park rangers.

- Outcome:
  - This system will enhance the protection of endangered plant species by providing constant surveillance and triggering timely interventions, ensuring the preservation of biodiversity in protected areas.
- Basic functionalities:
  - Use IoT sensors to monitor endangered species and trigger alerts for unauthorized activity, providing real-time updates for park rangers.

## [Optional] Additional Innovation

**1) Virtual/ Augmented Reality (VR/AR) Training for Park Guides**: Use VR/AR technology to simulate real park environments for immersive training.

- Implementation:
  - Develop tailored VR/AR scenarios that replicate realistic park environments and guiding situations, such as introducing visitors to key biodiversity concepts, demonstrating eco-tourism practices, or responding to wildlife encounters.
- Outcome:
  - Enhanced park guide training through immersive, hands-on VR/AR experiences, improving knowledge retention, practical skills, and confidence while ensuring accessibility and reducing logistical challenges.
- Basic functionalities:
  - Create VR/AR simulations to help train park guides on biodiversity, eco-tourism, and wildlife, improving skills and confidence

**Timeline for 2025 S1**

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|---|---|
| 03/03/2025 | 1 |
| 10/03/2025 | 2 |
| 17/03/2025 | 3 |
| 24/03/2025 | 4 |
| 31/03/2025 | 5 |
| 07/04/2025 | 6 |
| 14/04/2025 | *Tuition Week* |
| 21/04/2025 | 7 |
| 28/04/2025 | 8 |
| 05/05/2025 | 9 |
| 12/05/2025 | 10 |
| 19/05/2025 | 11 |
| 26/05/2025 | 12 |