# Project Indira – Integrated Digital Remote Algorithm

Data Extraction, Augmentation, and Visualization Framework

## Outline Endeavour (postulated):

Project Indira aims to deploy a Microsoft Azure-hosted Ubuntu server to develop and test a dynamic algorithm for processing construction-related data. The primary focus is on transforming Industry Foundation Classes (IFC) schema files, as well as other file types stored on a file server.

## Data Extraction and Processing:

Algorithm Development: A dynamic algorithm, implemented in Python, will be created to parse IFC schema files and other file formats.

Data Augmentation: Extracted data will be processed and enriched using a series of Pandas DataFrames, transforming raw information into structured, meaningful tables.

## Database Integration:

The augmented data is then written to a PostgreSQL database, establishing a robust backend to store and manage the processed information.

## Web Service and Visualization:

Backend API: Python web frameworks such as Flask or FastAPI will be employed to create an API that reads from the PostgreSQL database.

* Frontend Interface: The API will serve data to a JavaScript-based frontend, which will feature:
* Interactive Grid Tables: Utilizing libraries like AG-Grid (or similar) to create dynamic, filterable data tables.
* Data Visualizations: Integration with Plotly to generate interactive charts and Three.js to build 3D visualizations.

## Purpose and Applications:

The ultimate goal of Project Indira is to validate and ensure the quality of construction data before it is fed into downstream applications. These applications will use the curated datasets to:

* Generate registers of quantities.
* Develop work breakdown structures – consistently group and filter information
* Assign resources effectively.
* Package data for tools involved in planning, costing, and optimizing construction methodologies.

# System Setup and Application Status Report

## 1. System Overview

This report provides a detailed overview of the system setup, software installation, and the operational status of key applications on the configured virtual machine (VM).

### 1.1 System Information

Hostname: innaaedppvm01

Public IP: 4.197.251.181

Operating System: Ubuntu 24.04.1 LTS

Kernel Version: 6.8.0-1021-azure

Architecture: x86\_64

CPU: Intel Xeon E5-2690 v4 @ 2.60GHz (12 cores)

Memory (RAM): 112 GB

Swap: 0 GB (No swap configured)

Disk Space: 60.95 GB root partition (10.2% used), 724 GB mounted storage

## 2. Installed Applications and Services

### 2.1 Core Applications

|  |  |  |
| --- | --- | --- |
| Application | Installed | Running Status |
| File Manager (Nemo) | ✅ Installed | Not Checked |
| Web Browsers (Firefox, Chrome) | ✅ Installed | Not Checked |
| Database Tools (PostgreSQL, dBeaver) | ✅ Installed | ✅ Running |
| Development (VS Code) | ✅ Installed | Not Checked |
| Graphics & 3D (Blender) | ✅ Installed | Not Checked |
| Email Client (Thunderbird) | ✅ Installed | Not Checked |
| Web Server (Nginx) | ✅ Installed | ✅ Running |
| Remote Access (xRDP) | ✅ Installed | ✅ Running |
| System Management (Webmin) | ✅ Installed | ✅ Running |
| File Sharing (Samba) | ✅ Installed | ✅ Running |
| SSH Server (OpenSSH) | ✅ Installed | ✅ Running |

### 2.2 Running Services

The following services have been verified as running:

✅ Nginx (Web Server)  
✅ PostgreSQL (Database)  
✅ Webmin (Server Admin)  
✅ Samba (File Sharing)  
✅ xRDP (Remote Desktop)  
✅ SSH Server

## 3. System Updates and Firewall Configuration

Latest system updates have been applied successfully, with minor phased updates remaining. The firewall (UFW) has been enabled with the following rules:

- 22 (SSH) ✅ Allowed  
- 80 (HTTP) ✅ Allowed  
- 10000 (Webmin) ✅ Allowed  
- 5432 (PostgreSQL) ✅ Allowed  
- 139/445 (Samba) ✅ Allowed

## 4. PostgreSQL Remote Access Configuration

PostgreSQL has been configured to accept remote connections. The firewall has been updated to allow access on port 5432.

## 5. Final Status and Recommendations

✅ All critical services are up and running.  
✅ Firewall rules are correctly configured.  
✅ PostgreSQL remote access enabled.  
✅ No issues detected post-reboot.