eDCR Integration

For Automatic Building Plan Scrutiny

Copyright

Jambudvipa,
147 /J,1st floor, 10th cross,
12th main, 3rd block,
Koramangala
Bangalore-560034

Table of Contents

Acronyms

Term	Definition
API	API is the acronym for **Application Programming Interface**, which is a software intermediary that allows two applications to talk to each other.
BPA	**Building Plan Approval** encompasses all the processes involved in the approval of the building drawing plan submitted by architects. It encompasses steps - plan scrutiny, validation, approval, inspection, verification and permit generation.
CADD	**Computer Aided Design and Drafting** is a subfield of engineering that deals with the design and drafting of objects and materials through the use of specialized software that visualizes designs as modular 2 D and 3D computer models.
DCR	The rules that are designed to ensure the proper and efficient development of a city are the **Development Control Regulations.**
DXF	DXF is a file extension for a graphic image format typically used with AutoCAD (Computer Assisted Drafting) software. DXF stands for **Drawing eXchange Format**.
eDCR	**eGov Development Control Regulations** is the core component that handles drawing scrutiny of Building Plan and Layout Plans of eGovernment's Online Building Plan Application Software.
JSON	**JavaScript Object Notation** is an open-standard file format that uses human-readable text to transmit data objects consisting of attribute-value pairs and array data types (or any other serializable value)
OBPAS	**Online Building Plan Application Software** that is used to automate the various steps and workflows involved in approving a building plan. It reduces manual processes and helps in standardizing the approval mechanism as per the encoded building regulations.
REST	**Representational State Transfer**, is an architectural style for providing standards between computer systems on the web, making it easier for systems to communicate with each other.
ULB	**Urban Local bodies** are institutions of the local self-governance, which look after the administration of an area or small community such as villages, towns, or cities.

About eDCR

Building plan approval (BPA) is one of the key activities performed by Urban Local Bodies and Planning Authorities. The Online Building Plan Application Software (OBPAS) automates the various steps in the plan approval process. The core intelligence of OBPAS resides in the automatic scrutiny of building plans with reference to the Development Control Regulations of the state. This functionality is called as eDCR (eGov-DCR). It involves extracting the key plan parameters from the CADD drawing and evaluating the parameters against the defined rules in the State Development Control Regulations. Once the Plan Scrutiny is completed the Application will be processed for other workflow stages like Document Verification, Field Verification, NOC Certificates, Fee Computation, and Permit Generation.

eDCR Integration

eGov offers the complete OBPAS as an Open Source Application and eDCR is an integral part of it. The automatic scrutiny capability provided by eDCR can be leveraged by States which already have an existing BPA software through simple integration. This enables the States to reduce the manual and time-consuming process of evaluation of rules and ensures uniformity of evaluation.

This document helps in understanding the integration process of eDCR Service with an existing Building Plan Application software. At a broad level, competencies in the below technical and functional areas are necessary for integrating eDCR system,

- Integration expertise backed by a sound understanding of the architecture of the existing ecosystem, its uniqueness, features, flaws, and a complete understanding of the challenges involved in making them successfully work together.
- Subject Matter Expertise on Building Plan and DCR Rules to interpret DCR Rule Validation algorithm from the DCR Rules
- A good understanding of configuration of the DCR Rule Validations in the Validation Engine of the eDCR Service

> ***Note:*** *The detailed training prerequisites for integrating eDCR into any legacy BPA system are listed in* *Training Prerequisites for eDCR Integration* *section.*

Overview of eDCR Task Flow

The eDCR process typically involves below sequence of steps,

1. Capture drawing files in DXF format along with city identifier
2. Submit DXF format drawing file to eDCR system for scrutiny
3. Collect generated report from eDCR system with status as accepted or rejected. The eDCR system will generate additional information like floor wise area details, compound wall length, number of wells, etc
4. The DXF file can be resubmitted any number of times into the system, irrespective of the acceptance or rejection status
5. An accepted status of the drawing indicates that it is validated and approved against all the bylaws configured in the system. The integrating system can use this for further processing
6. The eDCR status report and associated details can be retrieved at a later point also by sending the unique Transaction Number to eDCR system

eDCR Architecture and API Specifications

The eDCR Service has **Extraction**, **Validation,** and **Repository** as the key components. The architecture depicted here covers integration aspects and the API requirements.

eDCR Integration Architecture Diagram

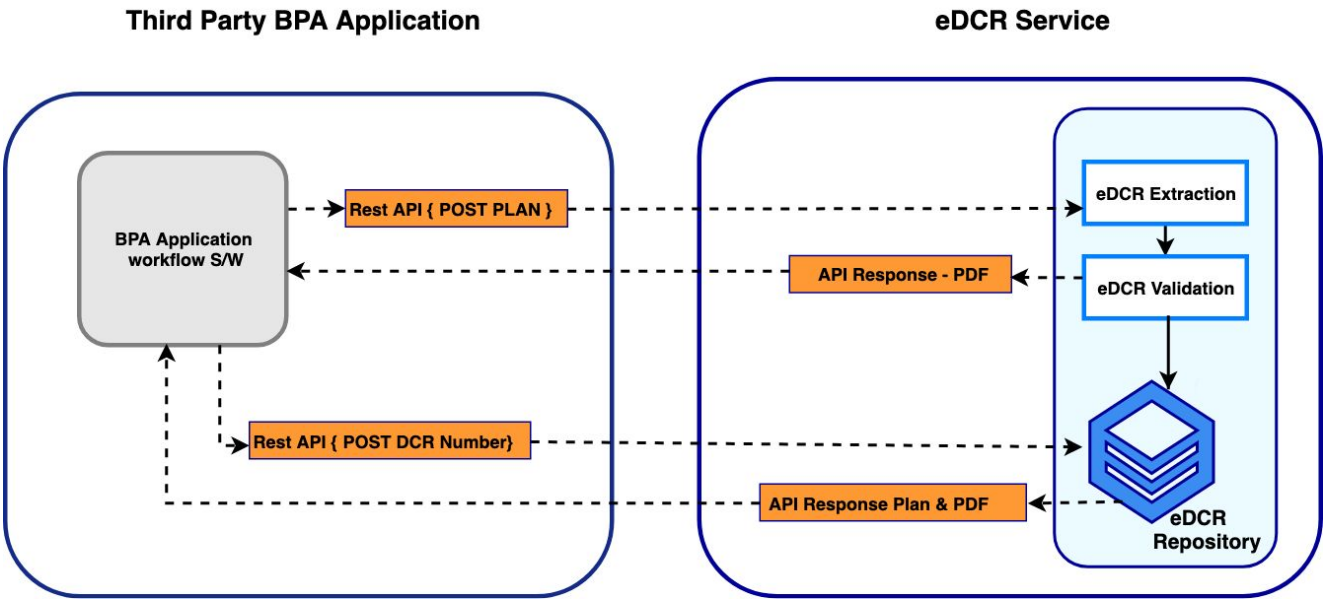


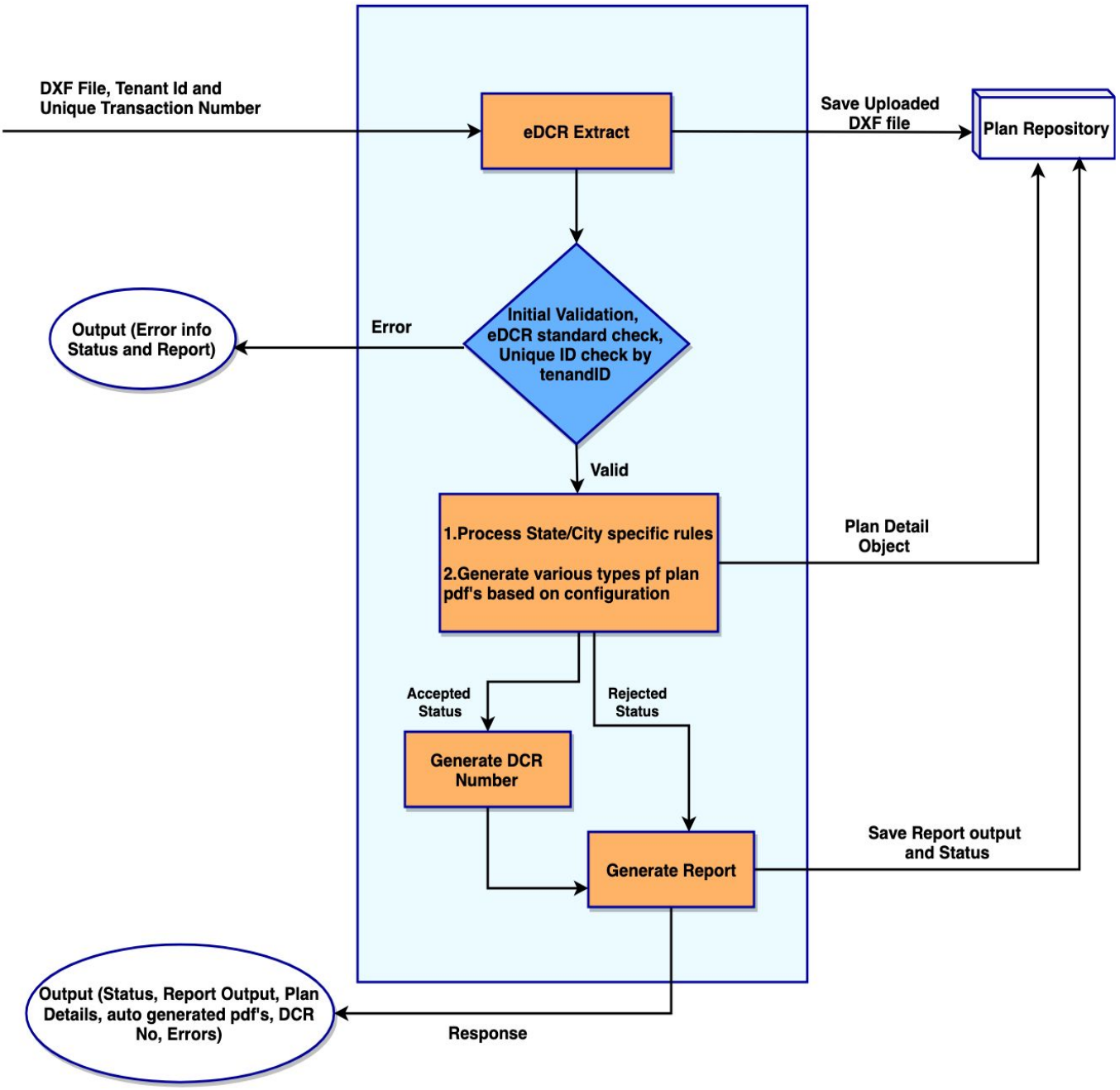
Fig 1: Integration Architecture - eDCR

eDCR Process Flow Diagrams

The below diagram clearly illustrates the process flow in the eDCR system. There are two major stages in the process

- Upload and Scrutinize Plan
- Get Details (To check plan scrutiny status)

Upload and scrutinise plan



Get Details

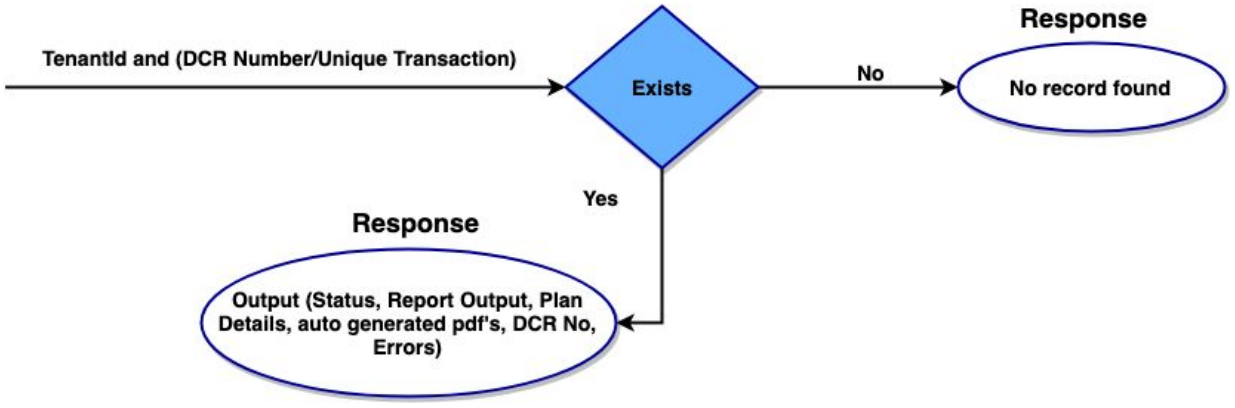


Fig 2: eDCR – Flows

eDCR API Specifications

1. eDCR system will provide REST APIs to push drawing file (DXF format) along with unique Id. The Integrating system will provide a unique Transaction Number. The same will be used by both systems to track application.

2. eGov will publish two REST APIs.

    - **Upload And Scrutinize Plan:** The integrating system should call this API with the required parameters explained in the API structure. The system will scrutinize the plan and reply with response as explained in the API structure. The Status "Accepted" indicates the plan is ready to use for further process. "Rejected" will indicate that either plan violates the rule or is missing basic information. Both rejected and accepted plans can be resubmitted. But eDCR system will consider each request as a new one.

    - **Get Details:** The integrating system will call this API with parameters specified in the API structure. The eDCR system will search for the details in the eDCR repository and respond with a) Status - accepted/rejected b) Scrutiny report c) Plan details (details present in dxf) d) DXF file e) Generated Plan pdfs. If the transaction number or Autodcr number does not exist in the system, an appropriate message is published.

***Note**: The REST API reference information with Request/Response Structures, Request Urls, Methods, Status Messages, Samples will be shared in subsequent documents.*

Training Prerequisites for eDCR Integration

For integrating eDCR the below knowledge and infrastructure requirements need to be addressed

- Odisha Building by-laws with latest amendments(hard or soft copy)
- Subject matter expert (SME) from ULB side, who understands the by-laws and building plan domain
- An architect who can draw diagrams for the team to test – He or She should be able to understand the by-laws given by the SME and create diagrams to validate those by-laws in the diagram scrutiny
- The technical team should have resources with 5+ years' experience in J2EE technology - Java, Spring, Hibernate, Postgress, Jboss/Wildfly, and GIT
- The technical team should be equipped with LINUX machines preferably UBUNTU and the following
    - Maven v3.2.x
    - PostgreSQL v9.6
    - Elastic Search v2.3.5
    - Git 2.8.3
    - JDK 8 update 112 or higher
    - Eclipse or any IDE
- Cloud instance for deployment (Azure / AWS)