**LICENSING APPLICATION WITH ESRI INTEGRATION**

**TECHNICAL DESIGN DOCUMENT**

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# Introduction

This technical design document outlines the architecture and design of a solution aimed at enhancing the efficiency and accuracy of the Application request process. The proposed solution utilizes ESRI Maps on top of SFDC to provide a streamlined experience for applicants, reviewers, and inspectors. The solution will be embedded in the Experience Cloud, allowing applicants to submit requests in a community-driven environment.

The current Application request process is often cumbersome, leading to delays. The proposed solution aims to address these issues by providing an integrated and user-friendly system. The system will provide a map-based interface where applicants can submit their requests and plot the relevant area using ESRI Libraries. The reviewers can then review and make changes to the map before approving or rejecting the request. Inspectors can use ESRI Maps to navigate to the physical location and confirm if the request meets expectations.

The proposed solution will utilize several components, including Omnistudio, LWC, VF page, and ESRI Maps libraries. These components will work together to achieve the project objectives. The LWC will receive the input from the user, which will then be submitted to the backend server. The server will process the request and store the data in the necessary objects. The VF page will display the map where users can plot the relevant area, and the ESRI Maps libraries will provide the map functionality.

This technical design document will provide a detailed description of the system architecture and design. It will cover the key components of the system, their roles, and how they interact with each other. The document will also provide a data model diagram to show how the data will be stored in the system.

The proposed solution promises to improve the overall experience for all parties involved in the Application request process. It will reduce the time and effort required to process requests, leading to improved efficiency and accuracy.

# Architecture and Design

## 2.1 System Overview

Our licensing system is a web-based application built on the Salesforce platform that allows users to apply for various types of business licenses. The system is built using a combination of Salesforce technologies such as Lightning Web Components (LWC), Visualforce Pages, and the Experience Cloud.

The key features of the system include the provision for users to draw polygons on ESRI maps for a given time period to maintain accuracy, and reviewers can adjust the polygon width, approve or reject the application. Rather than relying on the address, we are looking into the polygon drawn on the map by the applicant for accuracy. The ESRI Maps library is stored as a static resource inside SFDC and used only to render maps and leverage the core-provisions. All plotted data is stored inside Salesforce, and an API key is used to communicate with ESRI Maps.

Applicants will access the system by logging into the community. If the applicant is not a registered user, self-registration is enabled. After logging in, the user will go through a wizard to provide all the necessary details for the license request, including the map plotting. Once the user provides all the necessary details, a record in the object "Business License Application" will be created. Based on the location plotted, latitude and longitude will be fetched, and a record in the Location object will be created. If a record exists with the same latitude and longitude, a new record will not be inserted.

A record in the object "Authorization Application Place" gets created, which acts as a junction between BLA and Location. In the case of special events, the date and time entered will be captured in the object "Authorization Location Access Schedule". To determine the time slots of each polygon, we have created a new custom object by name "Polygon Schedule" that acts as a junction between the polygon object and "Authorization Location Access Schedule".

Once a BLA record is created, it will be moved to a queue "Reviewers Queue" so that all reviewers will be notified. Reviewers(Internal SalesForce Users) can alter the polygons drawn, approve the application, or reject the application. If the application gets approved or rejected, the applicant will be notified, and a record in the object "Business License" will be created. The applicant will open the Business License record and download the license document.

## Schema Builder

Diagram

Description automatically generated

## Data Model

### Business License Application

This object represents the application for a business license, and includes fields for the applicant's contact information and business details.

#### Custom Fields

|  |  |  |  |
| --- | --- | --- | --- |
| Label(Name) | Data Type | Description | Comments |
| Activity Approval Status (Activity\_Approval\_Status\_\_c) | Formula(Text) | This field is used to display the color on the basis of approval or rejection of related activities/tasks. It shows green color if all the associated activities are approvd | This field gets populated from the Activity Status Field. It used static resources and renders the green / red image based on the status approval. |
| Activity Status  (Activity\_Status\_\_c) | Text | It captures the status of all the related activities / tasks. | This field gets populated based on the status of its associated tasks |
| Contractor  (Contractor\_\_c) | Lookup(Account) | It captures the account who is submitting the application on behalf of another person. | This field gets populated if a contractor is creating application on behalf of applicant |
| IsOwner  (IsOwner\_\_c) | Formula (checkbox) | Formula to determine if the loggedIn User is the | This field helps to show a warning message to the User on the BLA page to assign the record to themselves prior to making any changes. |
| Reviewer Comments  Reviewer\_Comments\_\_c | Text Area | It captures all the comments from the reviewers on the associated activities | This field gets populated with the concatenated values of the all the reviewer comments from the associated tasks. |
| Venue Preference  (Room\_or\_area\_preference ) | PickList | Venue Type preferences for events. |  |
| Source  (Source\_\_c) | Text(255) | Used for storing the source of the application | This field gets populated in the DataRaptor of the OmniScript and this gets populated as “Esri Communitty” when applicant raises BLA from the Community |
| Type of Event (Type\_of\_Event\_\_c) | Picklist | For holding the type of event this application is being created for. | This will be populated by the Applicant while raising application |

### Location

This object stores the latitude and longitude of each polygon plotted by the applicant, along with other relevant details.

### Authorization Application Place

This object acts as a junction between the Business License Application and Location objects.

### Polygon

This object stores the GeoJSON data of the location plotted by the user and is a child of the Authorization Application Place object.

#### Custom Fields

|  |  |  |  |
| --- | --- | --- | --- |
| Label(Name) | Data Type | Description | Comments |
| Altered Data (Altered\_Data\_\_c) | Long Text Area(32000) | Used to store the altered polygon data if Reviewer has made some modifications. | As Reviewer has the flexibility to alter the polygon, this field will be holding the GeoJSON data of the altered version of polygon |

### Authorization Location Access Schedule

This object stores the date and time details for each polygon drawn on the map, and is related to the Authorization Application Place object.

### Polygon Schedule

This custom object acts as a junction between the Authorization Location Access Schedule and Polygon objects, and is used to determine the time slots for each polygon.

#### Custom Fields

|  |  |  |  |
| --- | --- | --- | --- |
| Label(Name) | Data Type | Description | Comments |
| Authorization Location Access Schedule  (Authorization\_Location \_Access\_Schedule\_\_c) | Long Text Area(32000) | Used to store the altered polygon data if Reviewer has made some modifications. | As Reviewer has the flexibility to alter the polygon, this field will be holding the GeoJSON data of the altered version of polygon |
| BLA Id  (BLA\_Id\_\_c) | Text(18) | To hold the Id of the BLA associated with | This field will help to get the Polygons |
| Business License  (Business\_License\_\_c) | Lookup(Business License) | This field is populated only when the record is approved and its associated Business License Application is also approved. |  |
| Comments  (Comments\_\_c) | Long Text Area(32768) | This stores the comments provided by Reviewer. |  |
| Polygon  Polygon\_\_c | Lookup(Polygon) |  |  |
| Review Completed  (Review\_Completed\_\_c) | Formula (Checkbox) |  |  |
| Status  (Status\_\_c) | Picklist |  |  |

### Business License

This object comes into picture when the application is approved by the reviewer, and stores information about the license status and the approved polygon schedule records.

# Salesforce Security, Access & System Settings

## 3.1 Overview

The security, access, and system settings of Salesforce are crucial aspects of any Salesforce implementation. When it comes to the business license application system, it is important to configure the system in a secure manner by implementing appropriate access controls and system settings to maintain the confidentiality and integrity of the data.

As profiles may not be the same in the target org, permission sets are used for determining access. Two permission sets are used, one by the name "ESRI\_Community" for the Applicant, and the other by the name "Reviewer" for the Reviewer.

**As the applicant is a community user, it's crucial to ensure that the profile assigned to the applicant has the "Customer Community Plus" license, as there could be an instance of DML on account/contact**. Appropriate CRUD and FLS permissions are assigned to the user's profile or permission set to enable the required DML operations on these objects.

By implementing these security measures, the application provides a secure and compliant environment for handling sensitive information, ensuring data confidentiality, integrity, and availability.

## 3.2 Permission Sets

### ESRI\_Community

* A custom permission set named "ESriCommunityUser" has been created to provide access to the specific features and functionality required for community Users.
* The " ESRI\_Community" permission set includes the necessary permissions and settings to allow community Users to draw polygons on the ESRI maps, submit license requests, and access their own Business License records.

### Reviewer

* A custom permission set named "Reviewer" has been created to provide access to the specific features and functionality required for Reviewers.
* This permission set includes the necessary permissions and settings to allow Reviewers to draw alter the existing polygons on the ESRI maps, approve license requests, and create Business License records.

# Component Types Breakdown

This section provides a detailed overview of the different technical components used in the application. This includes a breakdown of the purpose, functionality, and interactions of each component. This gives better understanding of how the application works and how it was built.

## Validation Rules

|  |  |  |
| --- | --- | --- |
| Name | Object | Description |
| NoEditApprovedApplications | BusinessLicenseApplication | This validation is to restrict any edits that happens on a Approved / Rejected BLA. For any edit to be made on such BLA, User must be having custom permission “Delegated\_User” |
| Review\_Comments\_are\_Blank | BusinessLicenseApplication | To ensure that review comments are populated while approving or rejecting an application |
| AprovalStatus\_Required\_if\_ stat\_Completed | Task | To ensure that the approval status(Custom Field) is populated |
| Aprovalstatus\_cannot\_Popula \_ifStatusNull | Task | Approval Status should be populated only for a completed task |
| Reviewer\_Comments\_is \_not\_populated | Task | To populate reviewer comments prior to approving or rejecting a task |

## Page-Layouts

|  |  |  |
| --- | --- | --- |
| Layout Name | Object Name | Comments |
| Feature Layer Layout | Feature\_Layers\_\_mdt | Page-Layout Assignment has to be done manually |
| Polygon Schedule Layout | Polygon\_Schedule\_\_c |
| BLA Layout | Reviewr\_Tasks\_\_mdt |
| Task Layout | Task |
| Utils Layout | Utils\_\_mdt |

## Flows

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| BLA\_Business\_License\_Creator\_Flow | Record Triggered Flow | Does the below   1. Creae Business License record on approval of BLA 2. Update the existing BLA with the BL created 3. Update the Polygon Schedule records with the BL created |
| BLA\_Share\_BLA\_Record\_with\_Applicant | Record Triggered Flow | To share the record with the applicant as the owner gets changed and Applicant will be losing access |
| BLA\_Task\_Creator\_Flow | Record Triggered Flow | To create tasks as per the custom metada “Reviewer\_Tasks\_\_mdt” once the status of BLA is changed to Awaiting Review |
| Task\_Update\_BLA\_Status\_and\_Reviewer\_Comments | Record Triggered Flow | If all the tasks associated to BLA are completed, then change the status of the BLA to “Review Completed” |

## OmniScripts

|  |  |
| --- | --- |
| Name | Description |
| Applicant Wizard | This is added on to the community for the applicant and will guide the applicant through the process of creating Business License Application |

## ApexClass

|  |  |
| --- | --- |
| Name | Description |
| Applicant\_Create\_Ctr | Apex Class that acts like a controller for the LWC component that is rendered while creation of BL Application for plotting maps |
| Applicant\_Create\_CtrTest | Test Class |
| Applicant\_Ctr | Apex class for fetching the necessary records for showing the relevant status to the Applicant for their application |
| Applicant\_CtrTest | Test Class |
| Applicant\_License\_Approved\_Ctr | Apex class for fetching the approved polygons for the corresponding BLA |
| Applicant\_License\_Approved\_CtrTest | Test Class |
| CreateEsriCustomerUserHandler | Apex Class for creating a community User ans assigning the permission set “ESRI\_CommunityUser” |
| CreateEsriCustomerUserHandlerTest | Test Class |
| Pckg\_PostInstall\_Cls | Apex class to insert a new queue “Reviewers” post installation of the package |
| Pckg\_PostInstall\_Cls\_Test | Test Class |
| Reviewer\_Approval\_Ctr | Apex Class to show / provided the necessary provisions for the reviewer to take necessary action on an application |
| Reviewer\_Approval\_CtrTest | Test Class |
| TestDataFactory | Test Class |

## ApexPages

As ESRI Library is not compatible with LWC, we are using VisualForce Pages and VF pages will be used as iframe inside LWC

|  |  |
| --- | --- |
| Name | Description |
| Applicant\_Create\_Page | Used by the applicant for plotting the polygon while creating BLA |
| Applicant\_License\_Approved\_Page | Used by applicant for checking the approved polygons in Business License |
| Applicant\_Page | Used by applicant for checking the status of each polygon in the BLA |
| Reviewer\_Approval\_Page | Used by the reviewer to alter / review the polygons of a specific BLA |

## LightningWebComponents

|  |  |
| --- | --- |
| Name | Description |
| applicant | Used by the applicant for plotting the polygon and to check the status after creating BLA |
| applicantChild |
| applicantCreate |
| applicantCreateChild |
| applicantLicenseApproved |
| applicantLicenseApprovedChild |
| applicantMapChildCmp |
| applicantMapCmp |
| esri\_footer | Footer used in the community |
| reviewerApproval | Used by the Reviewer for reviewing the BLA |
| reviewerApprovalChild |

## CustomPermission

|  |  |
| --- | --- |
| Name | Description |
| Delegated\_User | This custom permission will enable the User to alter the BLA though it is approved / rejected. |

## FlexiPage

|  |  |
| --- | --- |
| Name | Description |
| Esri\_Gis\_Business\_License\_Application\_Related\_List | Lightning theme of community |
| Esri\_Gis\_Business\_License\_Detail |
| Esri\_Gis\_Business\_License\_List |
| Esri\_Gis\_Business\_License\_Related\_List |
| Esri\_Gis\_Canvasapp\_Page |
| Esri\_Gis\_Check\_Password |
| Esri\_Gis\_Create\_Record |
| Esri\_Gis\_Error |
| Esri\_Gis\_Forgot\_Password |
| Esri\_Gis\_Home |
| Esri\_Gis\_Login |
| Esri\_Gis\_Login\_Error |
| Esri\_Gis\_Record\_Detail |
| Esri\_Gis\_Record\_List |
| Esri\_Gis\_Register |
| Esri\_Gis\_Related\_Record\_List |
| Esri\_Gis\_Search |
| Esri\_Gis\_Service\_Not\_Available |
| Esri\_Gis\_Sfdc\_Page |
| Esri\_Gis\_Too\_Many\_Requests |
| Esri\_Gis\_esri\_map |
| Esri\_Gis\_themeLayout\_Default |
| Esri\_Gis\_themeLayout\_Home |
| Esri\_Gis\_themeLayout\_Login |
| Esri\_Gis\_themeLayout\_ServiceNotAvailable |
| Business\_License\_Application\_Record\_Page | Record detail page holding different tabs including the Polygons plotted |
| Business\_License\_Record\_Page | Record detail page with different tabs including the approved polygons |
| Reviewer\_UtilityBar |  |
| Task\_Record\_Page1 | Record detail page including tabs for the reviewer to reivew the polygons |

## PermissionSet

|  |  |
| --- | --- |
| Name | Description |
| ESRI\_Community | Permission set to provide necessary access of the objects and fields |
| Reviewer |

## StaticResource

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| ESRIINIT | Zip | Bundle holding the necessary js libraries for showing the maps of ESRI |
| Green | Image |  |
| Red | Image |  |
| Footericons | Image |  |
| Github | Image |  |
| Loading | image |  |
|  |  |  |

## Apps

|  |  |
| --- | --- |
| Name | Description |
| Reviewer | App with tabs for the reviewer |

## Custom-Metadata

|  |  |
| --- | --- |
| Name | Description |
| Feature\_Layers\_\_mdt | Metadata that holds details of the feature layers to be shown on the Map for the Reviewer while reviewing BLA |
| Reviewer\_Tasks\_\_mdt | Metadata that holds the details of the tasks that should get created when Reviewer changes the status of BLA to “Awaiting Review” |
| Utils\_\_mdt | To avoid hardcoding in apex and to maintain scalability, this metadata is created such that scalabaility can be maintained |

# Appendices

* To fulfill the requirement of storing the location and time-slot details in a single object, it is necessary to create a custom object named "Polygon\_Schedule\_\_c". This custom object will act as a junction object between two other objects, namely "Authorization Location Access Schedule" and "Polygon". The purpose of this junction object is to establish a relationship between these two objects by creating a many-to-many relationship. This will allow the location and time-slot details to be stored in a centralized manner in the newly created object, thereby facilitating easy access and management of the data.
* In order to retrieve the Polygon Schedules associated with a Business License Application, a new text field of data type "Text” has been created. This field is named "BLA\_Id\_\_c". During the insertion of a Polygon Schedule record, this field will be populated by the data raptor. The purpose of this field is to establish a relationship between the Business License Application and the Polygon Schedule records. By populating the BLA\_Id\_\_c field with the relevant Business License Application ID, it will be easier to retrieve the corresponding Polygon Schedules in the future.