Learning Paths - Level 01

Building Applications

Session Breakdown

05 min ———— **01**   Introduction

05 min ———— **02**   Understanding Requirements

10 min ———— **03**   Modeling Data Structures

10 min ———— **04**   Implementing Business Logic

10 min ———— **05**   Designing User Interfaces

Part 01

Introduction and Session Scope

Have you ever bought a subscription to a Software or application that you had to Customize?

What are the pain points around traditionally customizing a DXP?

Developing an Application
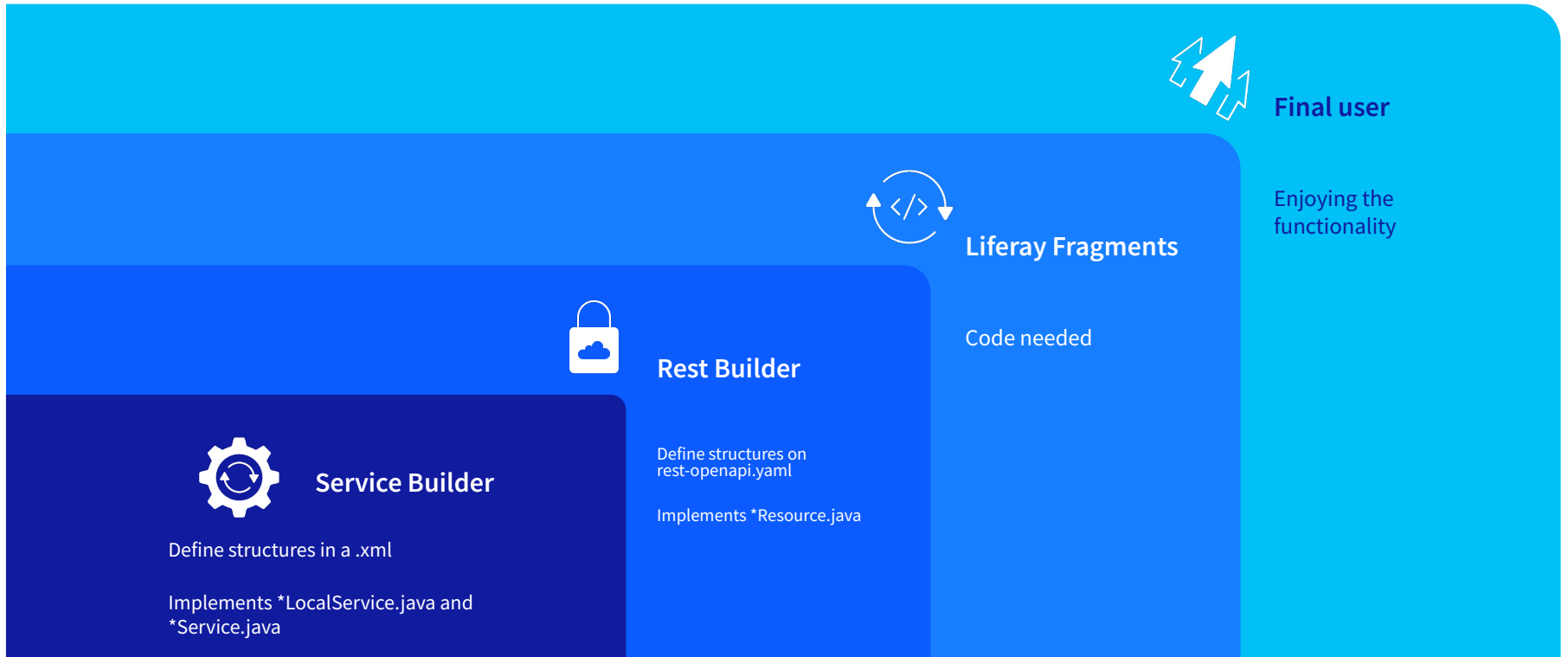
Traditional Development

It takes time

Only developers can do it

Changing OOTB behavior may not be that easy

Liferay

Traditional Development

Final user

Enjoying the functionality

Liferay Fragments

Code needed

Rest Builder

Define structures on rest-openapi.yaml

Implements *Resource.java

Service Builder

Define structures in a .xml

Implements *LocalService.java and *Service.java

What if you could leverage OOTB functionalities of a Platform and even create new ones without touching a single line of code?
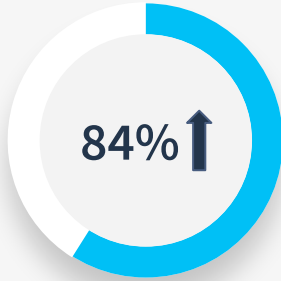
What's *Building Applications* and why is it important?

Introduction

- Liferay has been continuously investing in increasing its Low Code capabilities.

- "Building" is different from "Developing".

- It is available in all of the Deployment Approaches (PaaS, SaaS and SH) - even to the Community Edition.
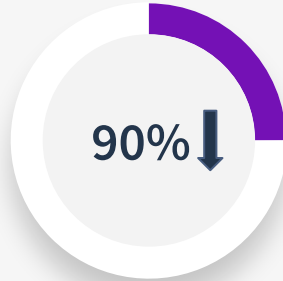
Low-Code

Low Code Statistics

84%⬆

Adoption

Enterprises are turning to Low/No code approach.

Source: Forrester Research

90%⬇

Development Time

By leveraging Developers experises.

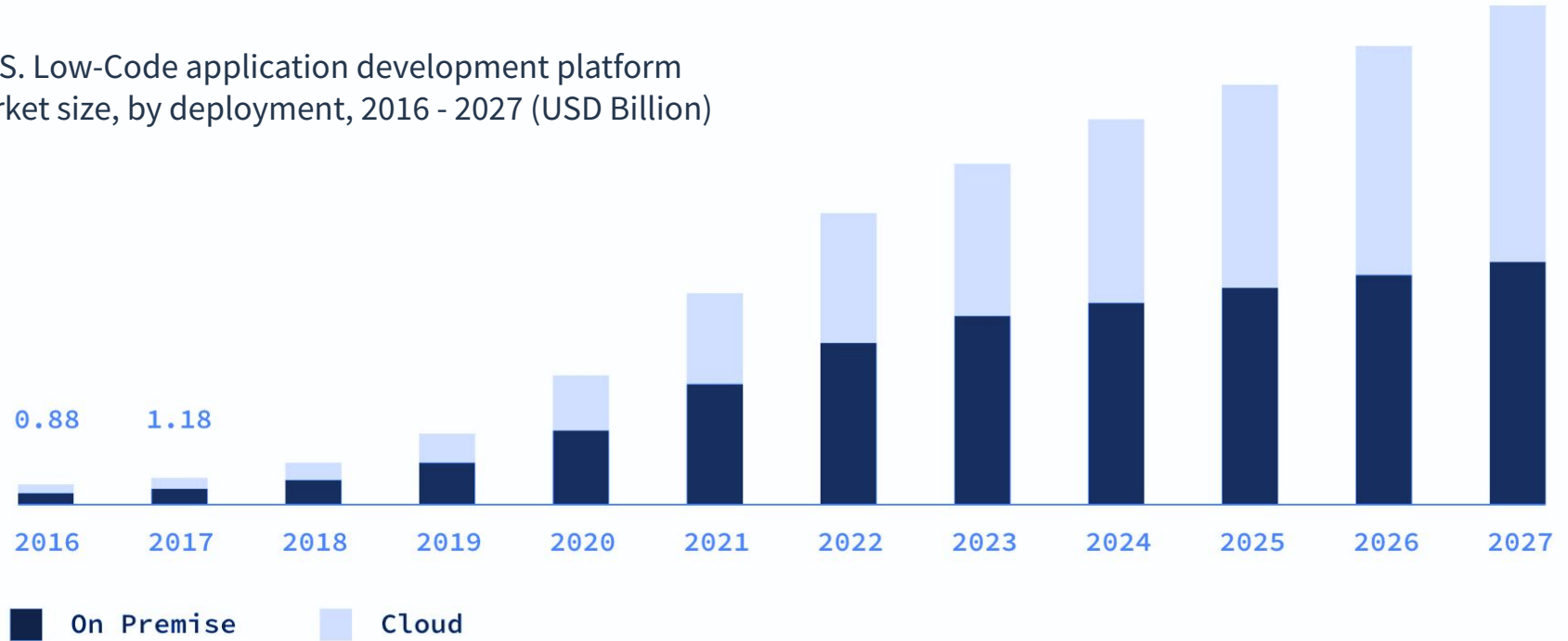Source: 451 Research / Advisory

10x⬆

Development Velocity

By introducing other stakeholders

Source: 451 Research / Advisory

Low Code and Cloud

US. Low-Code application development platform
market size, by deployment, 2016 - 2027 (USD Billion)

0.88   1.18

2016   2017   2018   2019   2020   2021   2022   2023   2024   2025   2026   2027

■ On Premise   ▢ Cloud

Source: www.grandviewresearch.com

Session Scope

- Understand what's possible with low code applications in Liferay.

- Focus on Objects and other Low-Code frameworks.

- Provide knowledge about:

    - Modeling data structures.

    - Implementing business logic.

    - Designing user interfaces.

- Highlight how to integrate Model Data with Liferay's core frameworks.

- Client extensions as another option to interact with data.

Part 02

Understanding Requirements

Clarity Business Requirements

- Clarity's is a global leader in optical technology that has been drawing interest from a growing number of international distributors.

- They need a custom solution for receiving and approving applications from B2B distributors.

- **Distributor Application**
  - Guest user's application request
  - Collect information to assess relative value of prospective distributor, e.g.: Applicant's Name, Title, Email…
- **Applications Evaluations**
  - Application request assessment
  - Store notes and recommendations made during the review process of the distributor application, e.g.: decision, interview notes…
  - Notification is sent to the user when the request is evaluated.
  - One application can be evaluated by many reviewers.

Part 03

Modeling Data Structures

Liferay Objects

- Unify the experience across the platform and leverage all capabilities.

- Build fully integrated Liferay applications without writing any code or manually deploying modules.

  - *Object definitions* - represent types of data entities.

  - *Attributes* - represent database columns that store specific types of information for an application.

  - *Object relationships* - determine how data is connected in your application.

Distributor Application Page

Define data structures

Data Entities

Attributes

Relationships
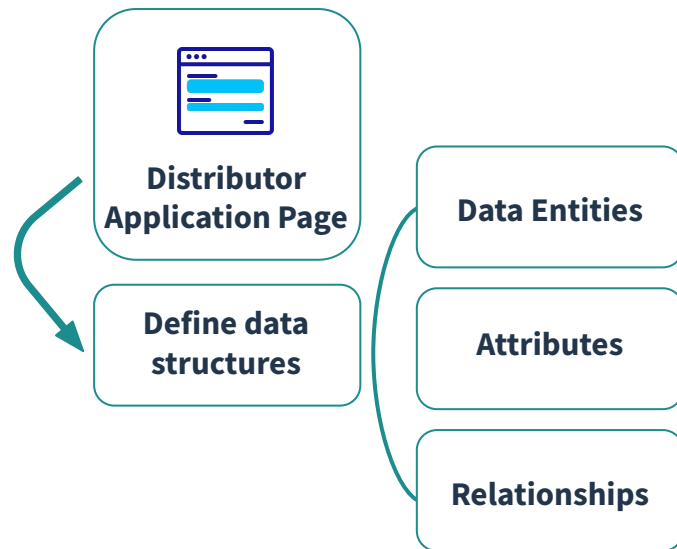
Identifying Data Entities

Distributor Applications

For receiving Applications

Application Evaluations

To store notes and recommendations for Evaluations

- Create object definitions that represent types of data entities:

    - A standard set of system fields.

    - Configuration for general details, behavior, scope/permissions, and available features.

- Headless REST APIs for CRUD operations will be automatically generated.

- Provides a basic user interface for objects and integration with Liferay Page Capabilities.

- Clarity must store and manage two types of data entities for the distributor application flow:

    - Distributor Applications

    - Application Evaluations

Picklists

Creating an Object

Model Builder

- Objects Model Builder GUI was created for designing complex object structures.
- With it, you can:
  - Visualize object definitions and relationships.
  - Create, manage, and extend data models.
  - Configure attributes and relationships.
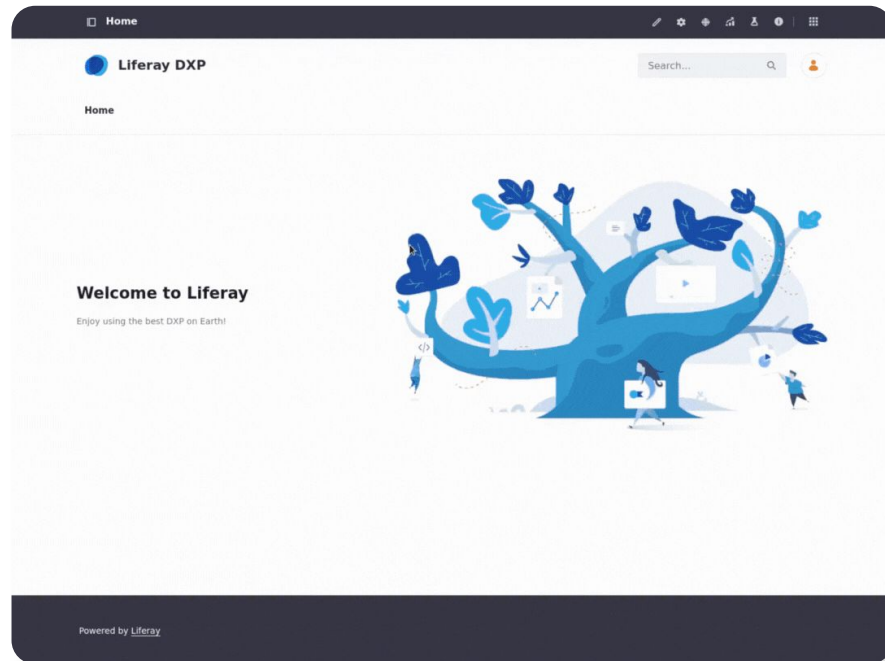
Creating a Relationship

Resources

Objects

https://learn.liferay.com/en/w/dxp/building-applications/objects

Part 04

Implementing Business Logic

What does Business Logic mean?

Business logic comprises the rules and processes that determine how an application behaves within a system to meet business needs. Implementing business logic effectively can streamline operations, improve efficiency, and promote consistency across your organization.

Implementing business logic allows Clarity to onboard distributors quickly and safely:

Validations   **Permissions**   **States**   **Workflows**   **Notifications**

Implementing Business Logic
Validations

- So far, Clarity has no way to ensure applicants provide valid, consistent data in their distributor applications.

- Validations set rules to ensure user input meets your criteria.

- Built-in validation functions for email addresses, phone numbers, and website URLs.

- Capability to add validation rules directly to object definition fields, have them trigger on submission of an object entry, and display an error message for invalid input.

Basic Info | **Unique Composite Key**

Fields

ⓘ **Info** A unique composite key validation checks if the combination of two or more fields can be used to uniquely id cannot be created.

Search

Label	Type
Bar to Foos	Relationship
Integer Field	Integer

Error Message

Message *

The field values are already in use. Please choose unique values.

Output Validation Type ❓
- 🔘 Full Validation (Form Summary)
- ⚪ Partial Validation (Inline Field)

Configuring Validations

Applying Validations
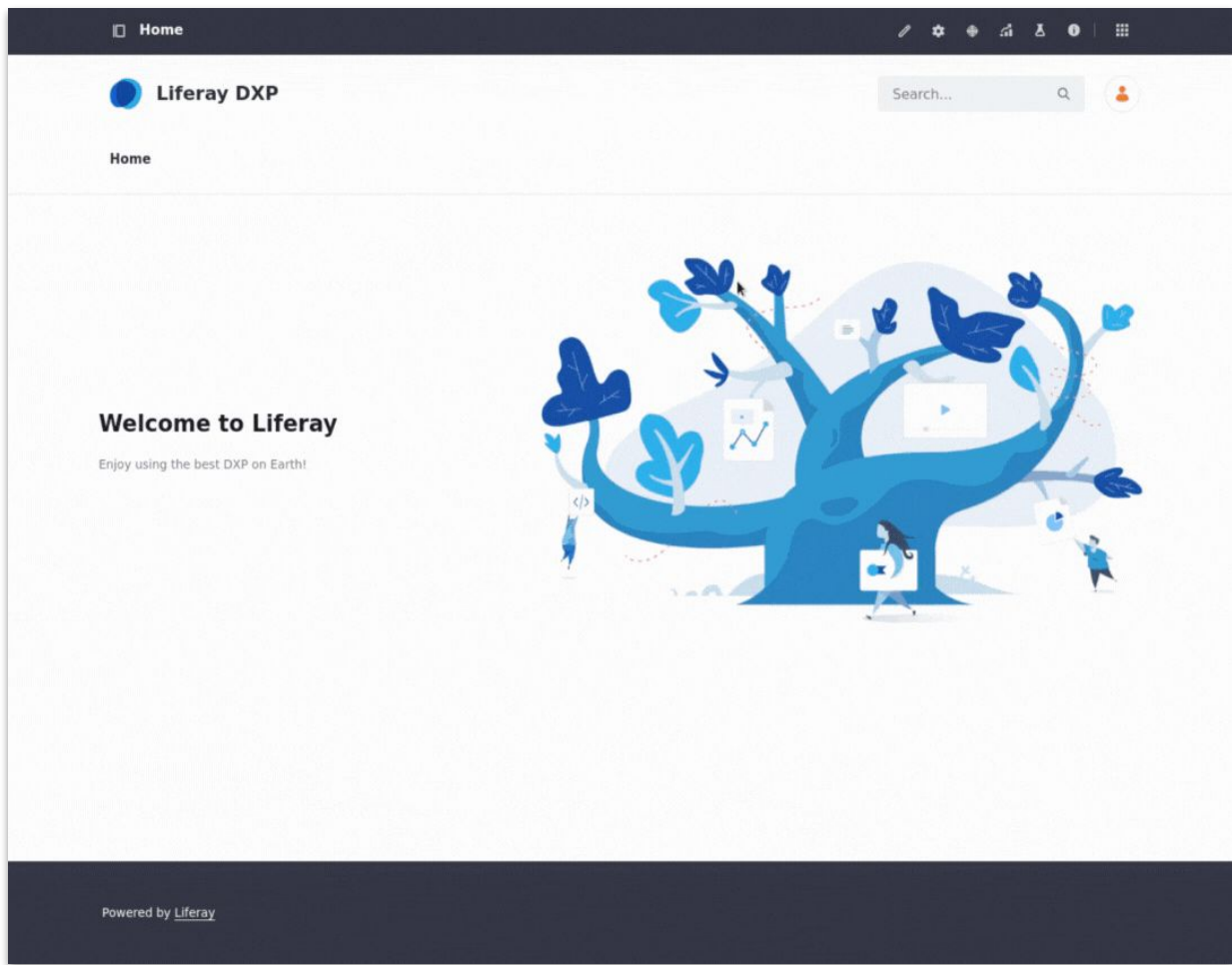
Permissions

- Clarity needs all, and only, authorized users can submit applications.

- Only business development team can view submitted applications and fill out evaluations.

- Modify User Roles to create, read, update, and delete object entries.

- Two roles: Business Development Specialist and Business Development Manager

- Use Widget configurations to fine tune the values based on business needs

- Manage Permissions and Entry Levels to access data with Account Membership.

  - Critical for data privacy and security.

User Permissions

Implementing Business Logic

States

- Clarity now needs a way to track the progress of a distributor application and trigger additional business logic when application entries reach certain statuses.

- To do this, Clarity leveraged Liferay's custom state field capability.

- When users update the Application State field of a Distributor Application object entry, their picklist options are determined by the state flow table.
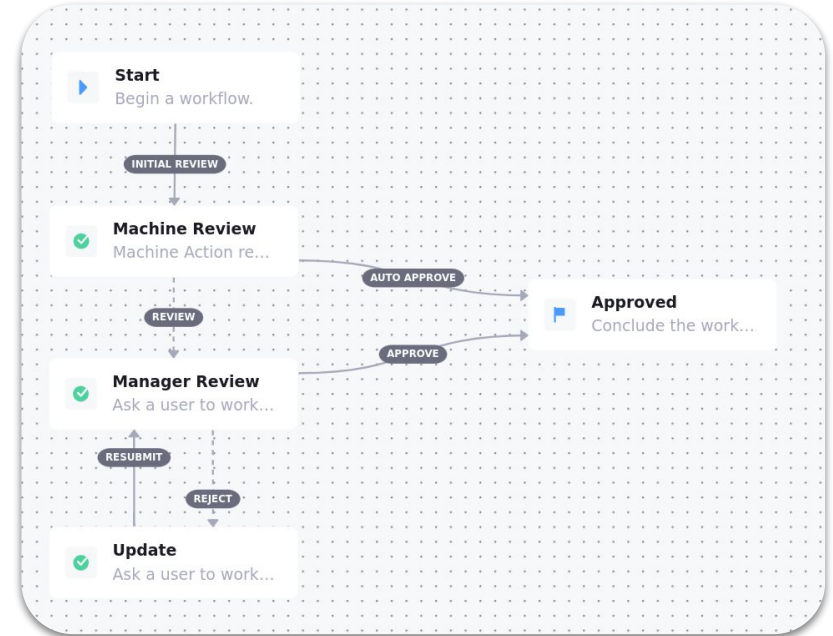
Application State Settings   ✕

Select the State Flow

State Name	Next Status
Open	Under Review ✕ Withdrawn ✕
Under Review	Approved ✕ Denied ✕ Withdrawn ✕ On Hold ✕
Approved	Under Review ✕
Denied	Under Review ✕
Withdrawn	Open ✕
On Hold	Open ✕ Under Review ✕

Cancel   Save

Workflows

- Currently: Application State field updates approved automatically, regardless the state value.

- Aim: require final approval whenever Application State changes to Approved or Denied.

- Use Workflow and Client Extensions for approval processes to: improve task visibility; eliminate bottlenecks in business processes; reduce the time and resources required to complete tasks.

Workflows

Liferay

For Liferay and Liferay Official Partners use only. Content Applicable for Liferay 2023-Q4 release and beyond.
Some features may not be available in earlier releases.

Implementing Business Logic
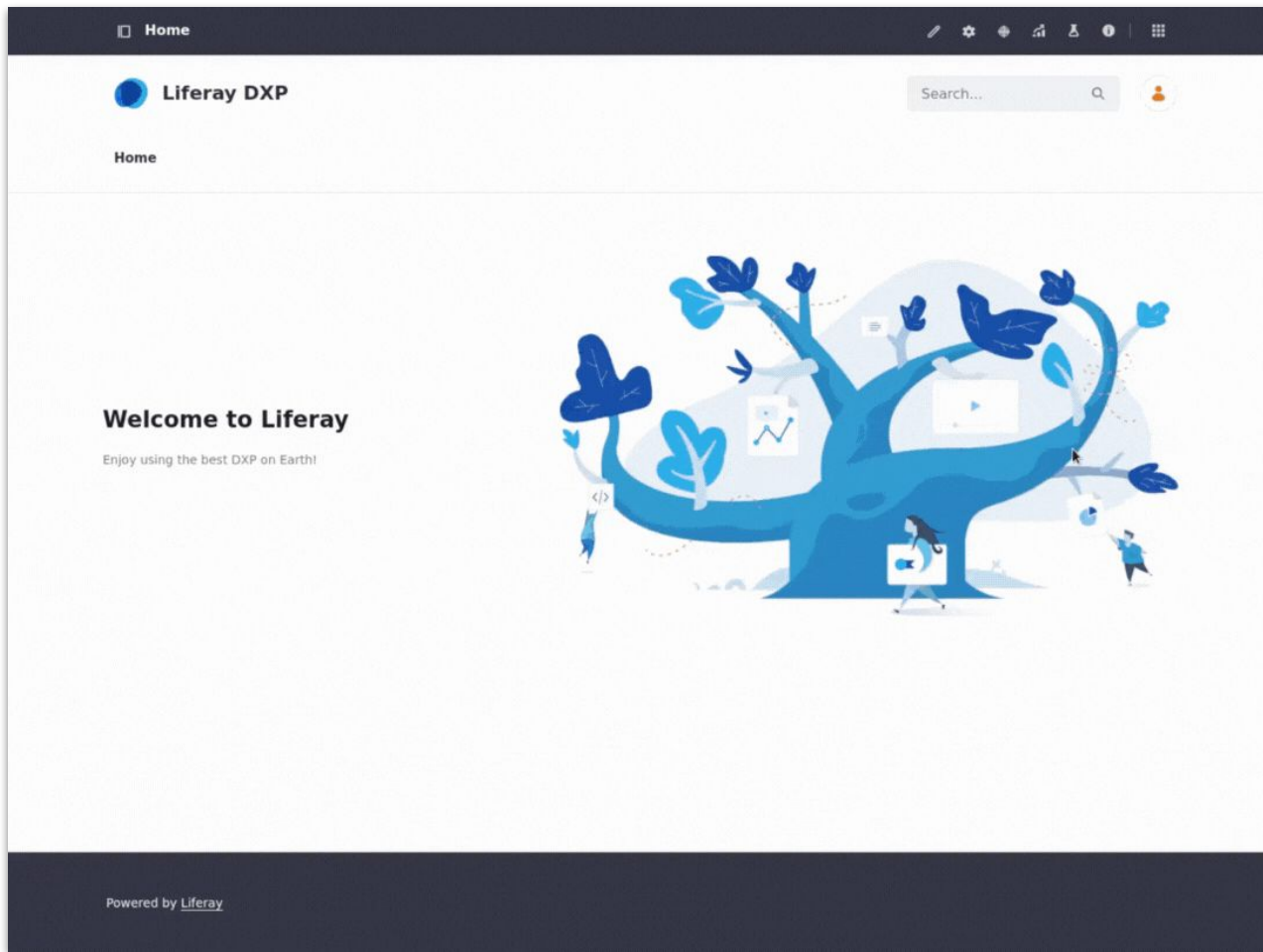
Notifications

- Clarity's defined workflows around state changes have no automated notifications.

- Business development team members have to manually check the Distributor Application object manually to see new application submissions.

- Applicants only know their application status if a business development specialist or manager informs them directly.

- They need a solution that is scalable, human error free, has good user experience, and focuses on not missing opportunities.

- Create notification templates and then apply them to object entry events (entry creation, entry update, etc.).

- Templates provide notifications with content and design, while the object entry event determines the condition to trigger them.
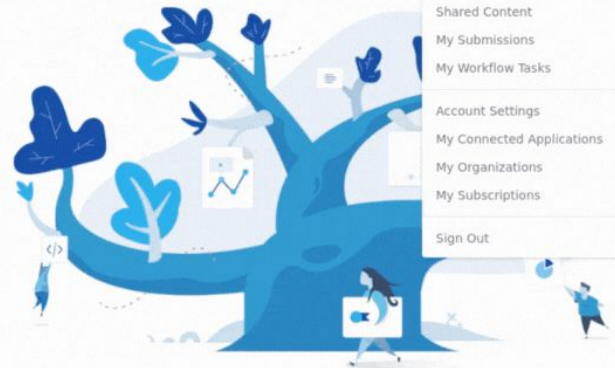

Liferay

Notification Templates

Liferay DXP

Home

Search...

JOHN DOE
My Profile
My Dashboard

Notifications
Shared Content
My Submissions
My Workflow Tasks

Account Settings
My Connected Applications
My Organizations
My Subscriptions

Sign Out
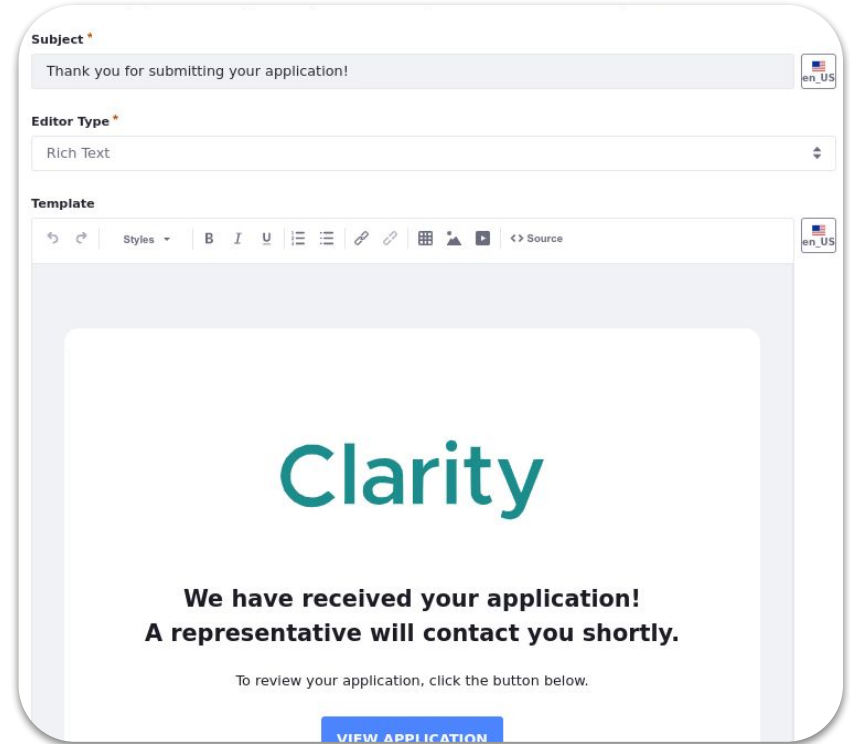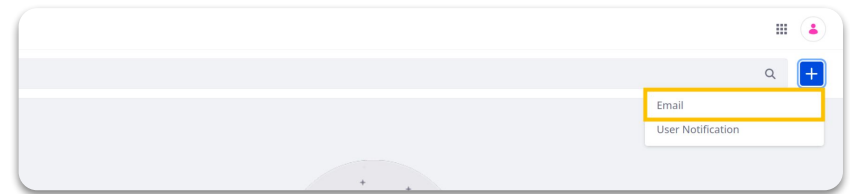
Welcome to Liferay

Enjoy using the best DXP on Earth!

Powered by Liferay

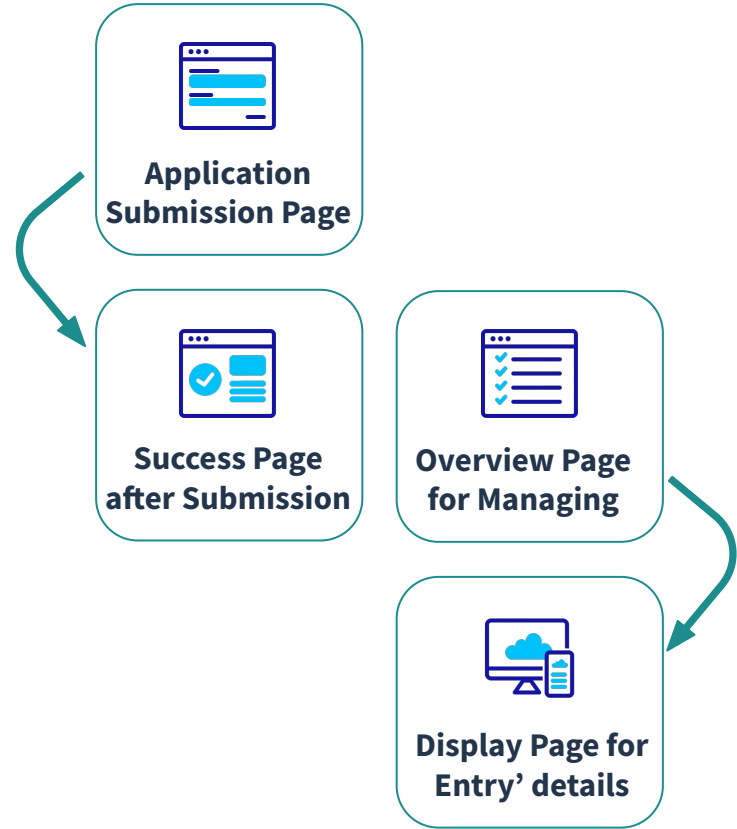**Applying Notification Templates**

Part 05

Designing User Interfaces

Creating User Interfaces

- Liferay provides tools for creating dynamic and responsive user interfaces for custom applications.

- To create seamless site experience there are page builder features such fragments and widgets for you to design forms, display object data, and more.

- Clarity wants to integrate the application with their enterprise marketing website.

- As standard object layouts and views are serviceable for administrative users they have limited customization options.

Application Submission Page

Success Page after Submission

Overview Page for Managing

Display Page for Entry' details

Application Submission Page

Liferay

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Success Page after Submission

Overview Page for Managing

Clarity

Home   Tickets ▾   Trial Guide   **Applications**   🔍

Distributor Applications

Filter ▾ | Search   🔍 |

Open   Resolved

Number	App Field	App Field	App Field	Submitted On
#10001	Applicant Name	Application #93879, description here	App Field value	Mar 16, 2022
#10001	Applicant Name	Application #93879, description here	App Field value	Mar 16, 2022
#10001	Applicant Name	Application #93879, description here	App Field value	Mar 16, 2022
#10001	Applicant Name	Application #93879, description here	App Field value	Mar 16, 2022
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Designing User Interfaces

Display Page for Entry' details

Display Page for Entry' details

Designing User Interfaces

Designing with Client Extensions

- Custom element client extensions uses Liferay's front-end infrastructure to integrate external applications with the platform and render them as page widgets.

- Custom elements allow web developers to define new HTML tags, extend existing ones, and create reusable web components.

- Applications from any domain accessible outside Liferay can be integrated in a Page.

- Developments based on frontend standards such as React, Vue, Angular or Custom Applications through external services.

Objecs

Page Builder

Extensions

No-low code

Liferay DXP

Liferay Cloud

Environment

Client Extension

Micro S. Extension

Schedulers

Extensiones

SAP, WS, Oracle
External Services

DMZ
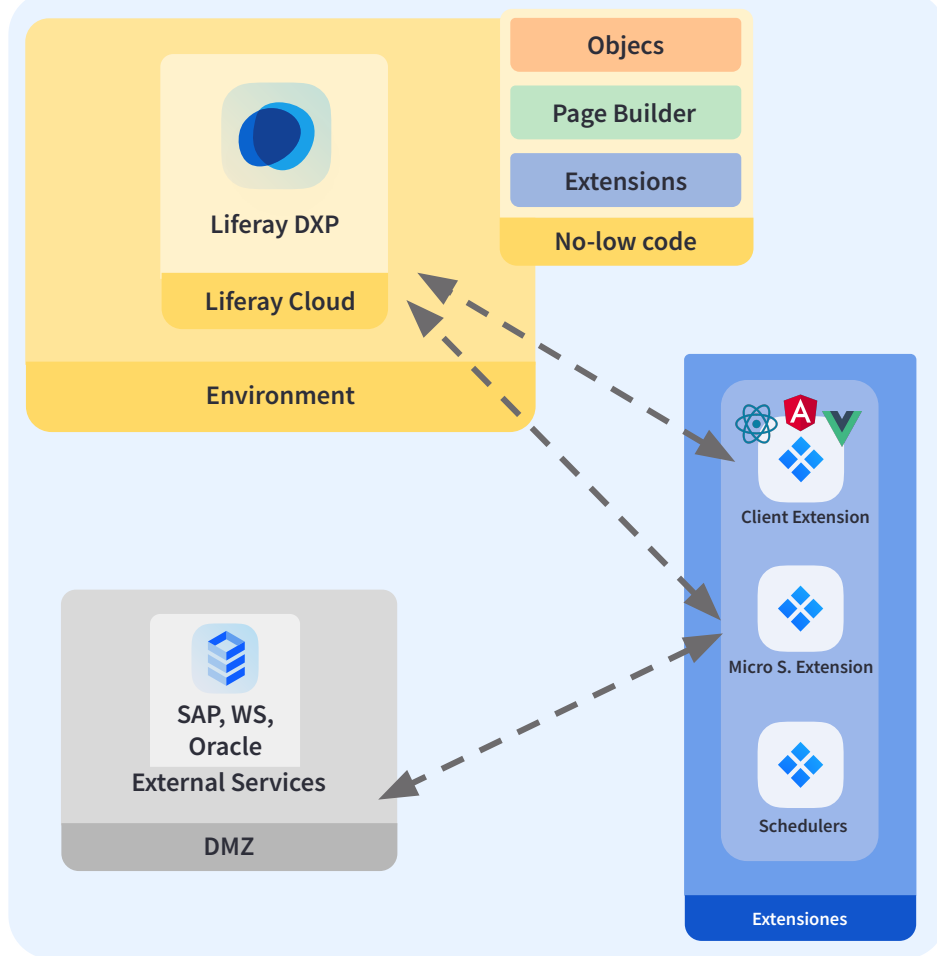
One more thing!... Liferay Object APIs

Liferay provides APIs to create and manage Objects but, additionally, publishing an object creates and activates your new application. When activated, users can access it in the Liferay UI according to its scope and panel link but also a new Headless API is automatically created for CRUD operations.

- Automatically generated REST APIs when Liferay Objects get published

- Accessible via the c/[pluralobjectlabel] naming pattern

- Perform CRUD operations: Create, Read, Update and Delete Object entries

- Use nestedFields to query and submit related entries

- **Designed User Interfaces** are able to access Objects using their APIs (React, Angular, Vue, etc.)

- Access to Objects using **Fragments, ADTs, JavaScript, etc.**

- **Integration with 3rd party systems** with Objects.

- **Standalone trigger** for object actions via UI and APIs.

Generated Object API

Resources

Client Extensions

https://learn.liferay.com/web/guest/w/dxp/building-applications/client-extensions

Resources

Form Fragments

https://learn.liferay.com/w/dxp/site-building/creating-pages/page-fragments-and-widgets/using-fragments/personalizing-custom-forms-using-form-fragments

Liferay Objects

- OSGi Modules are great but let's move forward.
- Liferay Objects can provide you the necessary tooling to Build Applications without coding (but you still can).
- It incorporates both Service builder and Rest Builder
- It is well integrated with other Liferay frameworks and functionalities to ensure compatibility and a seamlessly experience
- Headless APIs available

Liferay

Go out of the box building custom applications to tailor Liferay to your specific needs, and simplify their lifecycle leveraging maintainability and effortless upgrades in SaaS, PaaS and on-premises offerings.

Thank you