



Liferay Practitioner - Level 01 - Day 02

# Building Enterprise Websites with Liferay

## Building Enterprise Websites Bootcamp

# Lesson Topics

- |  |   |   |
|--|---|---|
| <input checked="" type="checkbox"/> Case Study                       | <input checked="" type="checkbox"/> Asset Management            | <input type="checkbox"/> Publications and Workflow          |
| <input checked="" type="checkbox"/> Deployment Options and Workspace | <input checked="" type="checkbox"/> Web Content Structures      | <input type="checkbox"/> Search Basics                      |
| <input checked="" type="checkbox"/> Security and Permissions         | <input checked="" type="checkbox"/> Content Display and Mapping | <input type="checkbox"/> Search++ with Blueprints           |
| <input checked="" type="checkbox"/> Site Management                  | <input type="checkbox"/> Integrating with AI                    | <input type="checkbox"/> Building Applications with Objects |
| <input checked="" type="checkbox"/> Analytics Cloud                  | <input type="checkbox"/> Classifying Content with Taxonomies    | <input type="checkbox"/> Client Extensions                  |
| <input checked="" type="checkbox"/> Pages and Page Templates         | <input type="checkbox"/> Understanding Collections              | <input type="checkbox"/> Segmentation and Experiences       |
| <input checked="" type="checkbox"/> Menus and Navigation             | <input type="checkbox"/> Commerce                               | <input type="checkbox"/> Performance Tuning and Mgmt.       |
| <input checked="" type="checkbox"/> Fragments and Design Elements    | <input type="checkbox"/> Headless APIs                          | <input type="checkbox"/> Certification Exam                 |



# Day 02 | Agenda

- |            |    |   |
|------------|----|---|
| 30:00 mins | 01 | Integrating with AI                                       |
| 30:00 mins | 02 | Classifying Content with Taxonomies and Using Collections |
| 45:00 mins | 03 | Commerce: Channels, Catalogs and Products                 |
| 15:00 mins | 04 | Headless APIs   |
| 50:00 mins | 05 | Collaborating with Publications and Workflow              |
| 15:00 mins | 06 | Search Basics   |
| 10:00 mins | 07 | Search++ with Blueprints                                  |



# Lesson 11

## Integrating with AI

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.



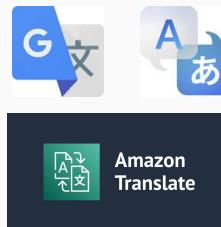
## Integration with AI

# Intelligence out of the Box

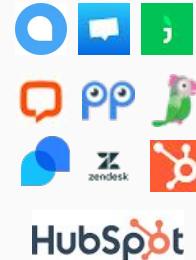
Making it simple for businesses to leverage the power of AI without the need for expensive customizations

- Configure integration with many of the most popular AI services
- Integrations with third parties that apply AI in their translations
- Operators with AI capabilities through Chatbots
- Automatic tagging of assets and images stored in the content manager
- Evaluation of search intentions through language used

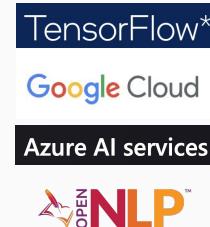
### Translations



### Live Chats



### Auto Tagging



### Semantic Search



# 19/ Auto-Tagging Content

## Integration with AI

# Auto-Tagging Content

Streamline content organization and discovery by automatically suggesting relevant tags and saving time for editors.

- **Multi-Provider Support:** OpenNLP, Google Cloud NLP, Microsoft Cognitive Services and TensorFlow
- **Increased Efficiency:** reduces manual tagging and ensures freshness as content is updated
- **Improved Content Findability:** enhance search results and user ability to discover relevant content

The screenshot shows the Liferay Admin UI with the following interface elements:

- Left Panel:** Shows the breadcrumb navigation: Instance Settings > Assets. Below it, under **VIRTUAL INSTANCE SCOPE**, are links for Google Cloud Natural Language Text Auto Tagging, OpenNLP Text Auto Tagging, Categorization, Google Cloud Vision Image Auto Tagging, Microsoft Cognitive Services Image Auto Tagging, and TensorFlow Image Auto Tagging.
- Right Panel:** A modal dialog titled **Asset Auto Tagging**. It contains the following sections:
  - Info:** This configuration is not saved yet. The values shown are the default.
  - Asset Auto Tagging:** Contains two checked checkboxes:
    - Enable Auto Tagging of Assets
    - Update Auto Tags
  - Maximum Number of Tags:** A text input field set to "5". A note below it states: "Set the maximum number of tags that will be automatically added to a single asset. Set to 0 if there is no limit. If this option is checked, the option to trigger auto tagging when editing an asset will be enabled by default." It also notes that "If this option is checked, the option to trigger auto tagging when editing an asset will be enabled by default."
- Buttons:** At the bottom right of the dialog are "Save" and "Cancel" buttons.



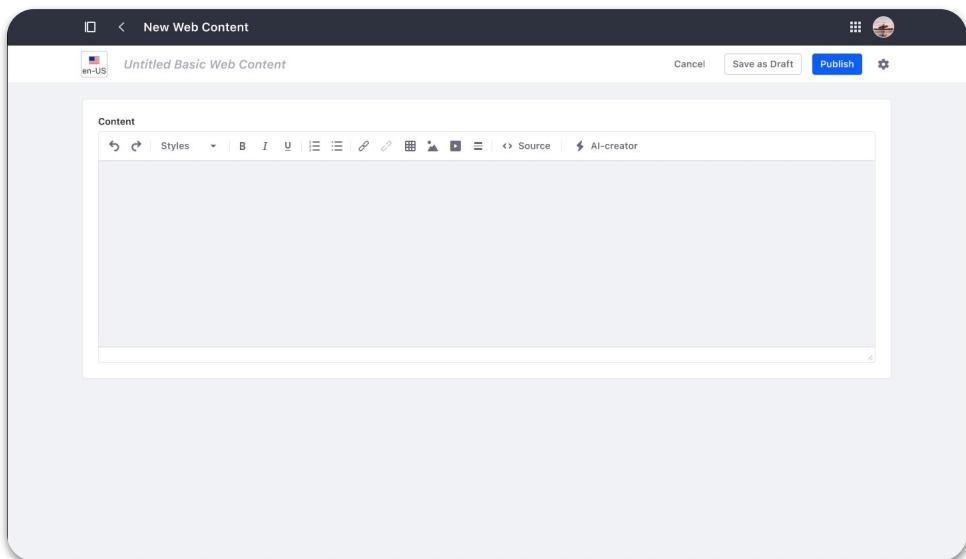
# **20/ Generating Content with Chat GPT**

## Integration with AI

# Generative AI Tools

Provide content authors and marketers with the tools they need to generate content quickly and be the first to hit the market with their products and services.

- Integration with Chat GPT API
- In-context access to AI tooling through editor tools
- Streamline content creation to reduce costs and accelerate time to market
- Per item AI criteria to allow you to adjust the parameters based on contextual needs

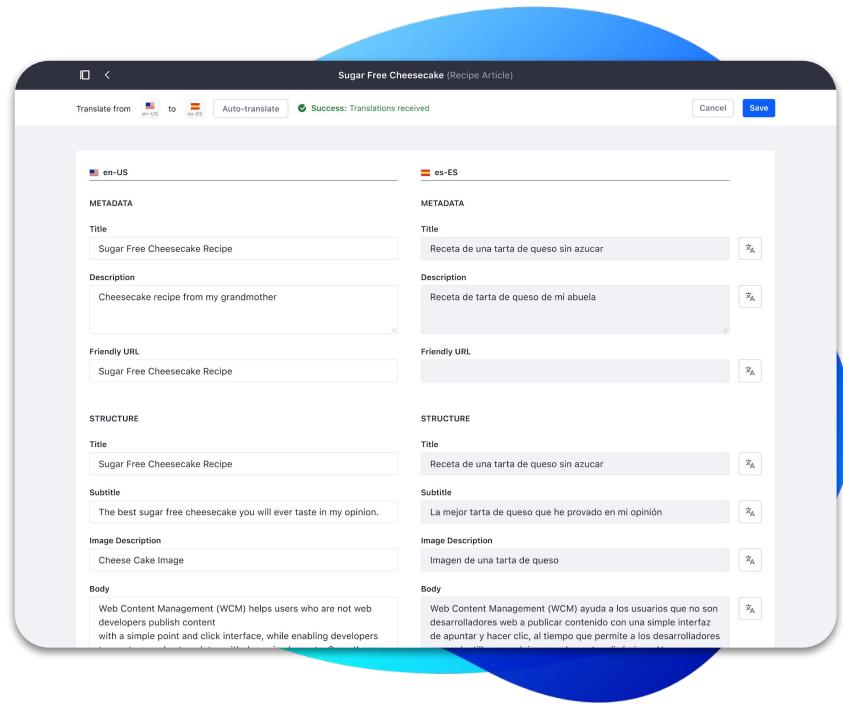


# **21/ Automatic Translation**

# Automatic Translation of Content

Automatic translation breaks down language barriers, reaching wider audiences faster by offering machine-translated content and improving global engagement.

- **Multi-Provider Support:** Amazon, Google, Microsoft and DeepL
- **Intelligent:** machine (learning) driven solutions can be trained to use your nomenclature, leading to more accurate results, the first time
- **Cost Effective:** reduce headcount and/or go to market faster by turning time consuming translations into simple review process





## Demo: Configuring AI for Web Content

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## Exercises #11a - #11b: Content Management using AI Tools





## Bonus Challenge

### Challenge

Enable text auto-tagging for Web Content so that when a new article is created it is auto-tagged using OpenNLP.

### Requirements

- Enable auto-tagging
- Configure the solution to use the OpenNLP provider
- Have new content auto-tagged
- Have updates to content be auto-tagged

### Success Criteria

Content should have tags associated based on the text for the article and the tags should have been automatically created using OpenNLP.



# Lesson 12

## Classifying Content with Taxonomies

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# Clarity Business Requirements

- Provide ability to categorize content that is intuitive and supports navigation based discovery
- Provide ability to categorize content that is flexible and non-restrictive
- Leverage the power of AI to help categorize content at scale
- Enable non-technical users to create category based navigation experiences





**Categories**

*or*

---



**Tags**



## Taxonomy: Vocabularies, Categories and Tags

# Taxonomies 101

- **Vocabularies;** think of these as boxes or a filing cabinet that are used to collect and organize categories related to a specific theme or topic
  - e.g. Products, Locations, Topics, etc.
- **Categories;** are like the drawers that represent the specific classifications for the vocabulary
  - e.g. Sunglasses, Lenses, North America, etc.
- Vocabularies sit at the top level while Categories can be nested to provide a logical hierarchy
- Vocabularies can be scoped (internal vs public) and can also be restricted to only being applicable to certain asset types (web content, documents, etc.)

The screenshot shows the 'Clarity Public Enterprise Website' interface with the 'VOCABULARIES' section selected. On the left, a sidebar lists various vocabularies: Global, Topic, Audience, Stage, Clarity Products, Clarity Public Enterprise Website, and FAQ. The 'FAQ' vocabulary is currently active, indicated by a blue bar. Below the sidebar, there are sections for Region, Location, Job Position, Blog Posts, and Articles. The main content area displays a table of categories under the 'FAQ' vocabulary. The table has columns for Category, Description, Usages, Subcategories, and Create Date. The categories listed are: Retail Partners, Products & Services, Pricing & Ordering, and Return and Exchange. Each category row includes a checkbox, a link to the category details, usage count (3), zero subcategories, and a creation date of '16 Days Ago'. A 'New' button is visible at the top right of the table.

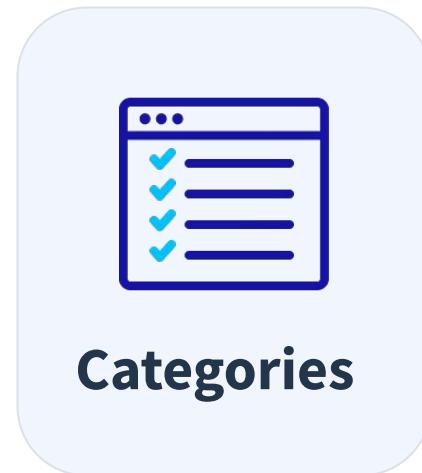
| Category            | Description | Usages | Subcategories | Create Date |
|---------------------|-------------|--------|---------------|-------------|
| Retail Partners     |             | 3      | 0             | 16 Days Ago |
| Products & Services |             | 3      | 0             | 16 Days Ago |
| Pricing & Ordering  |             | 3      | 0             | 16 Days Ago |
| Return and Exchange |             | 5      | 0             | 16 Days Ago |



# Categories

Provide a hierarchical structure for organizing your content, simplifying navigation, improving searchability, and ensuring a user-friendly browsing experience.

- **Content Association:** Categories are primarily used to organize content during creation or editing. They allow for assigning specific classifications to assets.
- **Search and Navigation:** Categories facilitate content search and navigation by allowing users to filter based on assigned categories.
- Categories offer more “controlled” or structured approach with strictly defined terms and hierarchy

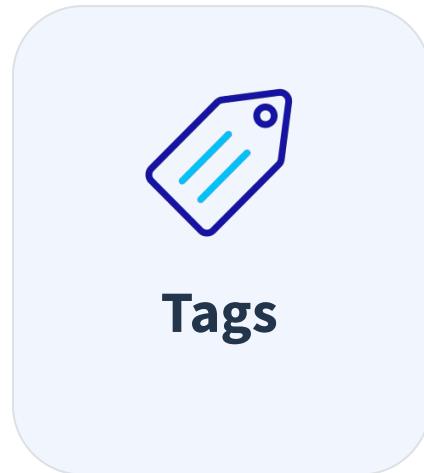


## Taxonomy: Vocabularies, Categories and Tags

# Tags

Tags promote a user driven approach by providing a crowd sourced classification model for content. Tags allow for granular labeling and discovery, enriching content findability and user engagement.

- **Anyone Can Use Them:** Unlike categories, tags can be added by both administrators and users during content creation or editing.
- **Informal Classification:** Tags represent informal keywords or labels associated with content.
- **Discovery and Exploration:** Tags help users discover content through search or browsing based on these user-defined keywords.
- AI Integration supporting auto-tagging of content





## Demo: Working with Taxonomies



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## Exercises #12a - #12b: Structures, Content and Taxonomies

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# Lesson 13

## Understanding Collections

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# Clarity Business Requirements

- Provide a curated list of Helpful Articles on the website home page
- Provide a FAQ page that displays Frequently Asked Questions
- Provide a company blog page that dynamically displays latest blog posts
- Provide a gallery that showcases company leadership





**Asset  
Publishers**

*or*



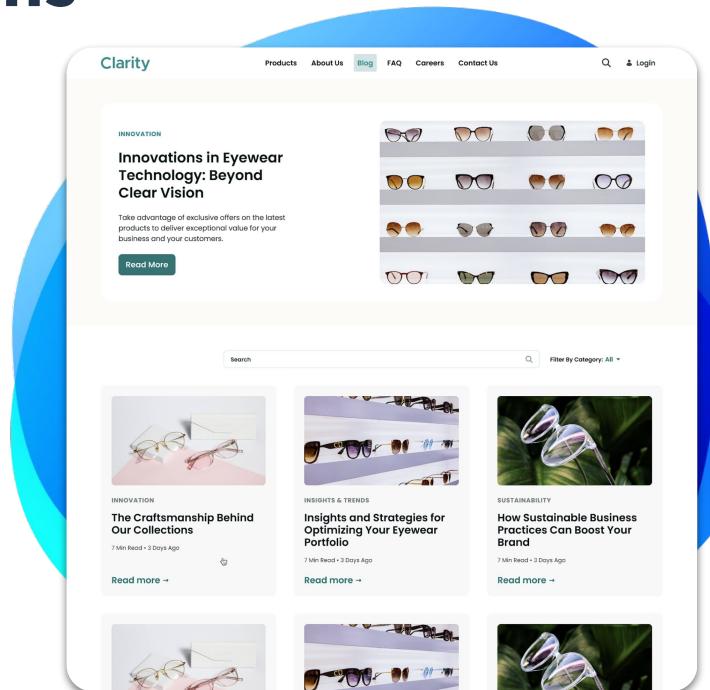
**Collections**



## Content Management in Action

# Asset Publishers AND Collections

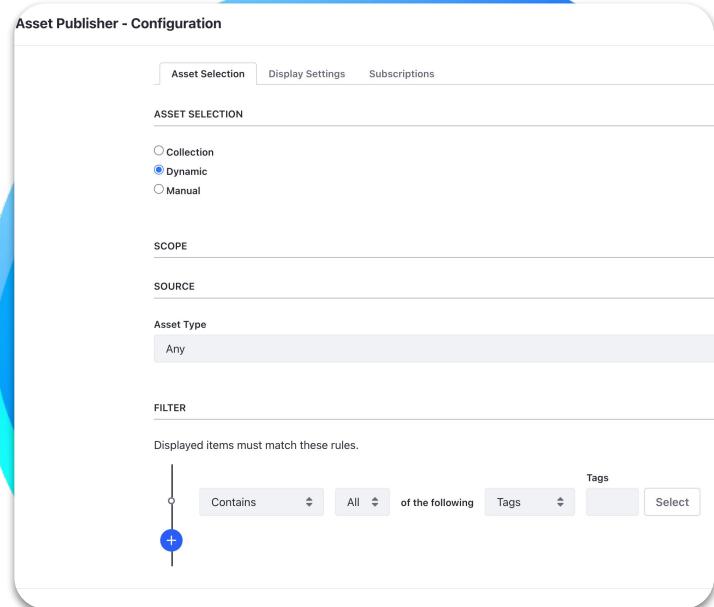
- **Mixed-Content;** can represent all of the same type or a mixed-bag of different types of content
- **Manual or Dynamic;** hand pick the items or allow for selection criteria to choose items on the fly
- **Filter, Sort and Order;** control what and how items are displayed based on different criteria
- **Examples:** Latest news, Resources, Upcoming events, etc.



## Content Management in Action

# Asset Publishers

- **Self Contained;** all details in one place – both the selection criteria as well as how to handle the rendering
- **Supports Complex Templates;** can handle complex templating requirements because presentation layer is driven by *Widget Templates* that use Freemarker
- **Supports Collections;** can have selection criteria directly specified or, preferably, be configured to use a *Collection* to source the data



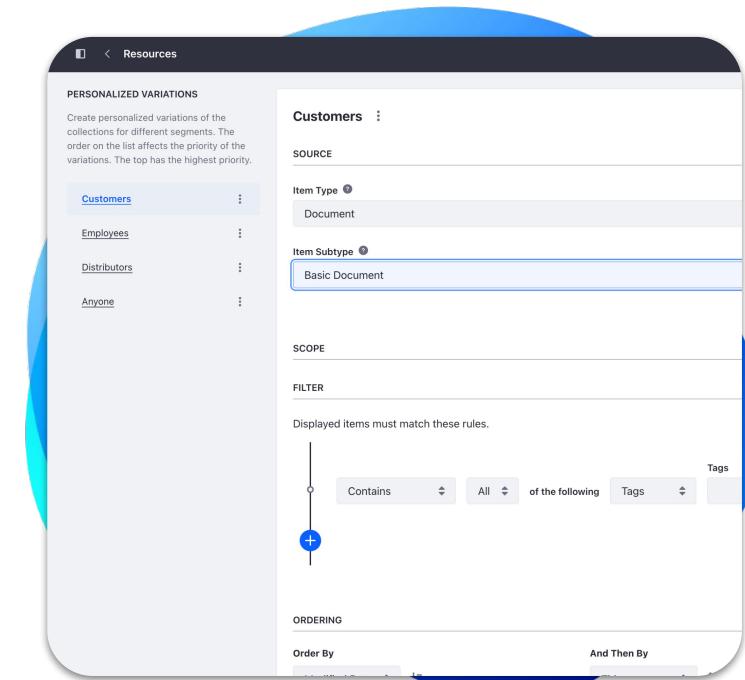
The screenshot shows the 'Asset Publisher - Configuration' dialog box. At the top, there are three tabs: 'Asset Selection' (selected), 'Display Settings', and 'Subscriptions'. Below the tabs is a section titled 'ASSET SELECTION' with three radio button options: 'Collection' (unselected), 'Dynamic' (selected), and 'Manual' (unselected). Further down are sections for 'SCOPE' (empty), 'SOURCE' (empty), and 'Asset Type' (set to 'Any'). A 'FILTER' section follows, containing the text 'Displayed items must match these rules.' and a configuration interface. This interface includes a 'Tags' button, a 'Select' button, and a 'Contains' dropdown menu with options 'All' and 'of the following'. A '+' button is also present in the filter area.



## Content Management in Action

# Collections

- **Separation of Concerns;** collections are meant solely to define the asset selection criteria
- **Reusable;** define them once and then use them on multiple pages either with fragments or to power *Asset Publishers*
- **Personalized;** works with segmentation to allow for personalized collections based on detected user segment
- **Programmatic;** can be created via plugin or automatic collection provider generation via objects framework and blueprints
- **Integrated;** supported by both newer *Page Builder* and fragments as well as older model with *Asset Publishers*

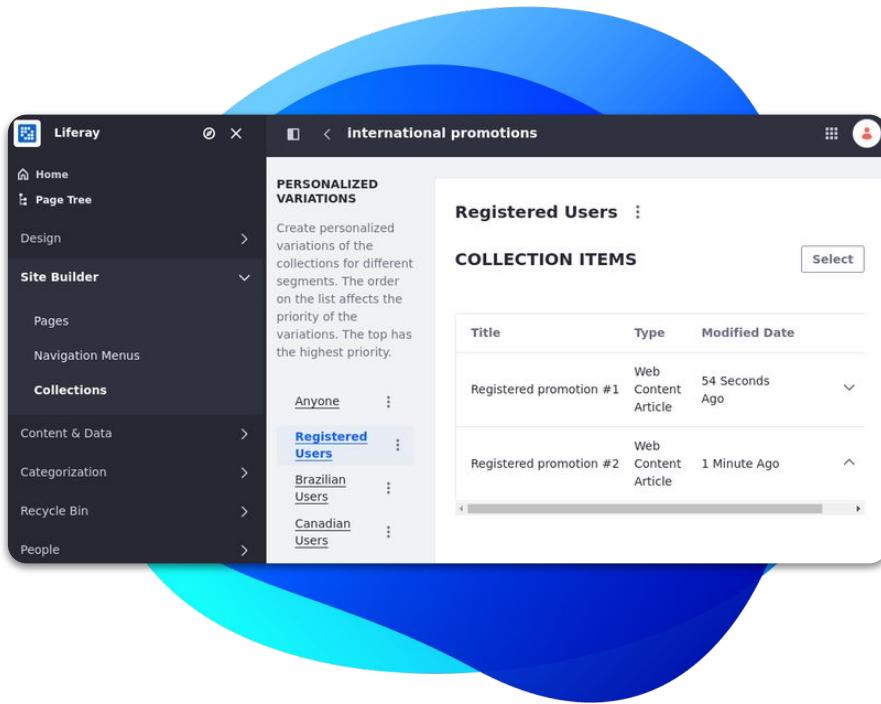


## Content Management in Action

# Personalizing Collections

Deliver targeted content experiences, boosting user engagement and conversion rates by showcasing relevant information to specific audience groups

- Does not require management of multiple pages to deliver personalized experiences
- Create a unique variation of relevant content for any Segment
- Personalized collections are used in exactly the same way as their default variant, in:
  - Asset Publisher, Collection Pages, Fragments, etc.



**Use Collections for asset selection, even if you still  
need an Asset Publisher for complex templating.**



## Demo: Creating Segmented Collections



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## Exercises #13a - #13d: Displaying Content with Collections

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# Lesson 14

## Commerce: Channels, Catalogs and Products

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# Clarity Business Requirements

- Organize products into well defined categories and sub-categories for easy browsing and product discovery
- Provide detailed and engaging product information
- Track product inventory levels in real-time
- Integration with systems (both internal and external) such as inventory management and shipping providers
- Capability to provide direct to consumer (B2C) transactional commerce (future state)
- Easily search and filter products based on various criteria like category, price or specific attributes
- Personalized content by recommending products based on browsing behavior or purchase history



# 22/ Catalogs

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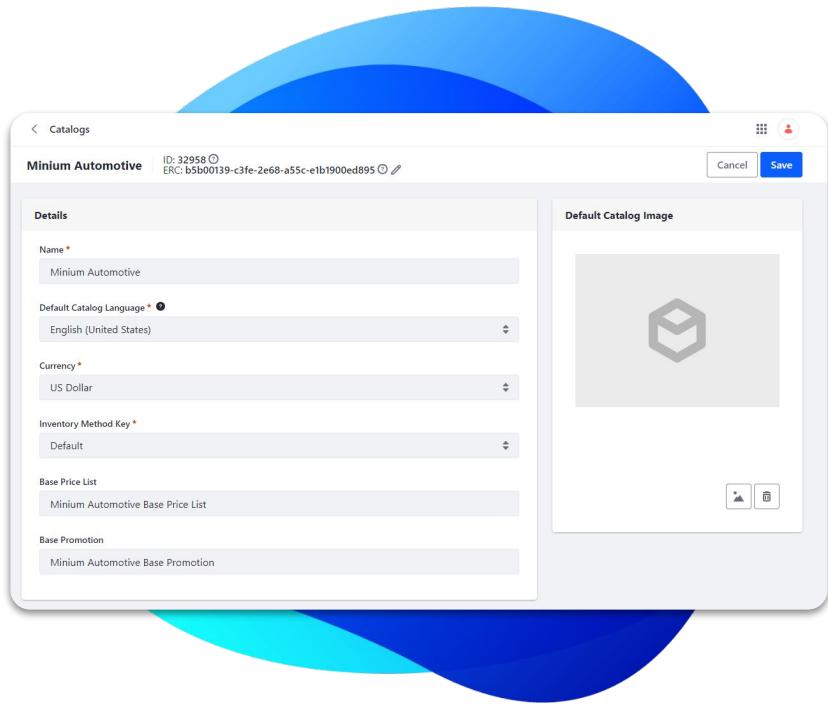


## Commerce: Channels, Catalogs and Products

# Catalogs

A catalog is the complete list of related products that can be displayed on a store site.

- Store administrators can create multiple catalogs (each with their own corresponding currencies) on a single Liferay Commerce instance.
- With each catalog a default catalog language and currency is associated.
- While creating a catalog, Base Price List and Base Promotion list get created
- Products in a catalog that do not have an associated product image use a placeholder image until one is configured. The default placeholder image is defined for each catalog.



# 23/ Products

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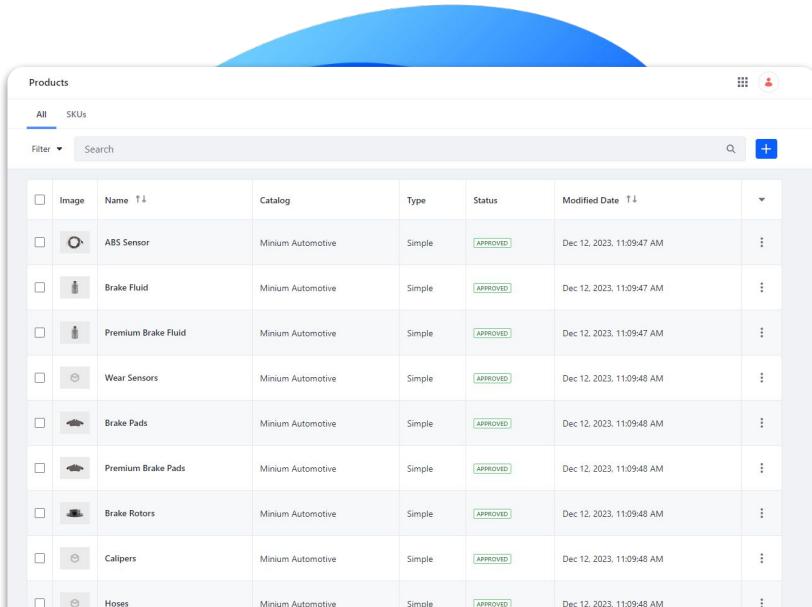
## Commerce: Channels, Catalogs and Products

# Products Overview

Commerce Catalogs provides four out-of-the-box Product types:

Simple, Grouped, Virtual and Diagram.

- **Simple Product:** Any physical product for which inventory is tracked.
- **Grouped Product:** Two or more Products from the Catalog that are packaged together and sold as a single item. Grouped Products are tracked in your inventory and can contain Simple Products, other Grouped Products, or Virtual Products.
- **Virtual Products:** Any non-tangible Product, such as music files, electronic publications, services, and warranties.
- **Shop by Diagram:** These are component parts belonging to a Bill of Materials (BOM) diagram that reference products in the store.



The screenshot shows a user interface for managing products. At the top, there's a navigation bar with tabs for 'All' and 'SKUs'. Below that is a search bar with a magnifying glass icon and a '+' button. The main area is a table titled 'Products' with the following columns: Image, Name, Catalog, Type, Status, and Modified Date. There are nine rows of data, each representing a different product: ABS Sensor, Brake Fluid, Premium Brake Fluid, Wear Sensors, Brake Pads, Premium Brake Pads, Brake Rotors, Calipers, and Hoses. Each row includes a checkbox, an image thumbnail, the product name, its catalog (Minium Automotive), its type (Simple), its status (Approved), and its modified date (Dec 12, 2023, 11:09:47 AM). To the right of the table, there are three decorative semi-circular shapes in blue, teal, and light blue.

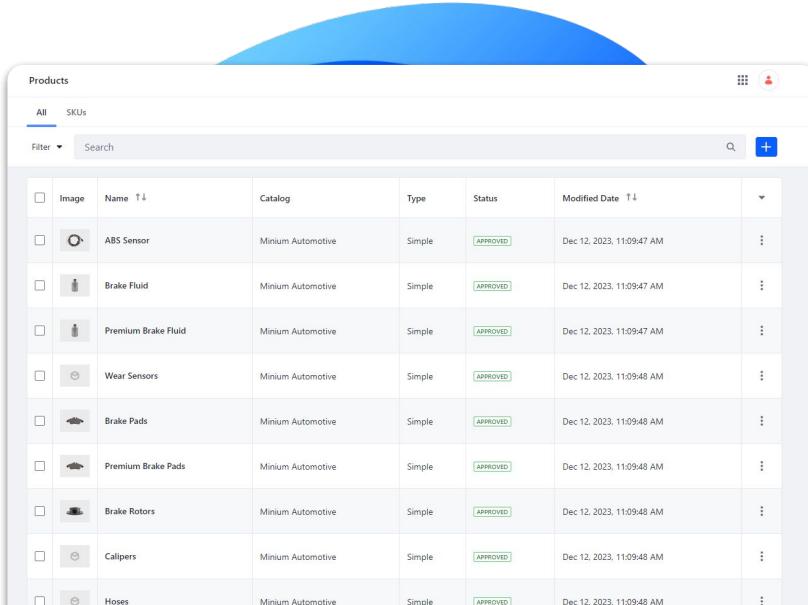
| Image | Name                | Catalog           | Type   | Status   | Modified Date             |
|-------|---------------------|-------------------|--------|----------|---------------------------|
|       | ABS Sensor          | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:47 AM |
|       | Brake Fluid         | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:47 AM |
|       | Premium Brake Fluid | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:47 AM |
|       | Wear Sensors        | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM |
|       | Brake Pads          | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM |
|       | Premium Brake Pads  | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM |
|       | Brake Rotors        | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM |
|       | Calipers            | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM |
|       | Hoses               | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM |



# Additional Benefits of Products

Leveraging *Products* offers more than just a predefined type of content. It also hooks into many additional advanced features to create a first class experience with minimal effort.

- Product details
- Product options
- Units of measure
- Configurable products
- Product media (images, videos, etc)
- Shop by diagram
- Multiple product type support
- Related products
- Downloadable product documents
- Product availability
- Product variants



The screenshot shows a Liferay commerce interface titled "Products". The table has columns for Image, Name, Catalog, Type, Status, and Modified Date. There are 10 rows of data, each representing a different product: ABS Sensor, Brake Fluid, Premium Brake Fluid, Wear Sensors, Brake Pads, Premium Brake Pads, Brake Rotors, Calipers, and Hoses. All products are categorized under "Minium Automotive", are of type "Simple", and have a status of "APPROVED". The modified date for all entries is "Dec 12, 2023, 11:09:48 AM". Each row includes a checkbox and a three-dot menu icon.

| Image | Name                | Catalog           | Type   | Status   | Modified Date             | ⋮ |
|-------|---------------------|-------------------|--------|----------|---------------------------|---|
|       | ABS Sensor          | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:47 AM | ⋮ |
|       | Brake Fluid         | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:47 AM | ⋮ |
|       | Premium Brake Fluid | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:47 AM | ⋮ |
|       | Wear Sensors        | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM | ⋮ |
|       | Brake Pads          | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM | ⋮ |
|       | Premium Brake Pads  | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM | ⋮ |
|       | Brake Rotors        | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM | ⋮ |
|       | Calipers            | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM | ⋮ |
|       | Hoses               | Minium Automotive | Simple | APPROVED | Dec 12, 2023, 11:09:48 AM | ⋮ |

# 24/ Channels

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## Commerce: Channels, Catalogs and Products

# Channels

- Store administrators can create multiple channels, each representing a different customer experience (e.g. B2B, B2C, B2X)
- Channels can be linked to Liferay Sites or you can use Liferay's Headless APIs to create native mobile applications or to integrate with external marketplaces
- Channels define default display languages and currencies, as well as default product display pages and category pages
- For transactional sites, Channels define payment, shipping, and tax configuration

The screenshot shows the 'Channels' configuration page for a channel named 'Clarity Public'. The page is divided into several sections:

- General:** Includes fields for Name (Clarity Public), Currency (US Dollar), and Commerce Site Type (B2C).
- Eligibility:** Fields for Shipping Tax Category (No Tax Category) and Price Type (Net Price).
- Prices:** Fields for Discounts Target Price Type (Net Price).
- Orders:** Fields for Buyer Order Approval Workflow (No Workflow) and Seller Order Acceptance Workflow (No Workflow). There are also toggle switches for Shipping Price Zero (SHOW) and Purchase Order Number (HIDE).

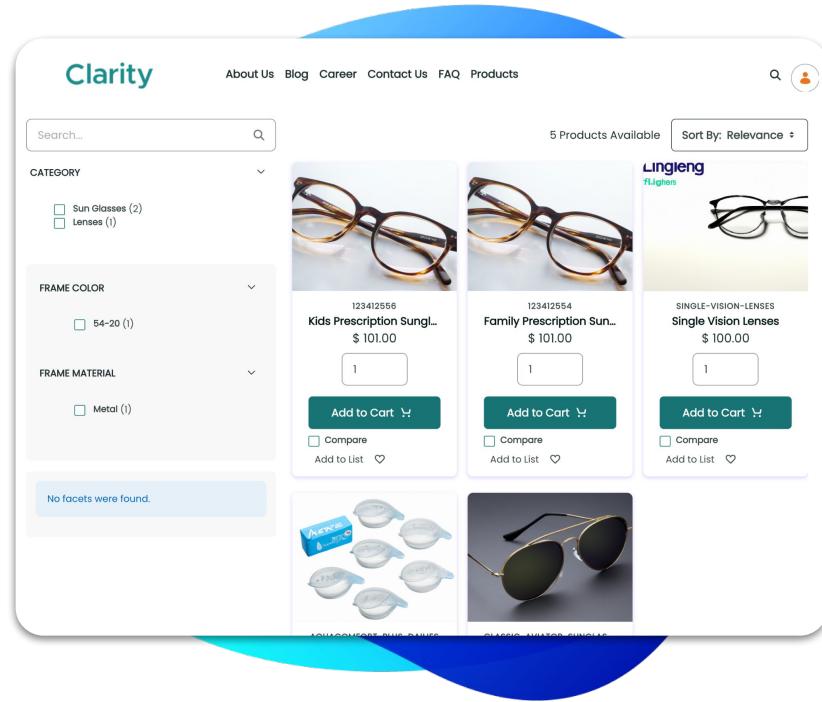
At the top right, there are 'Cancel' and 'Save' buttons.



## Commerce: Channels, Catalogs and Products

# Product Listing Pages

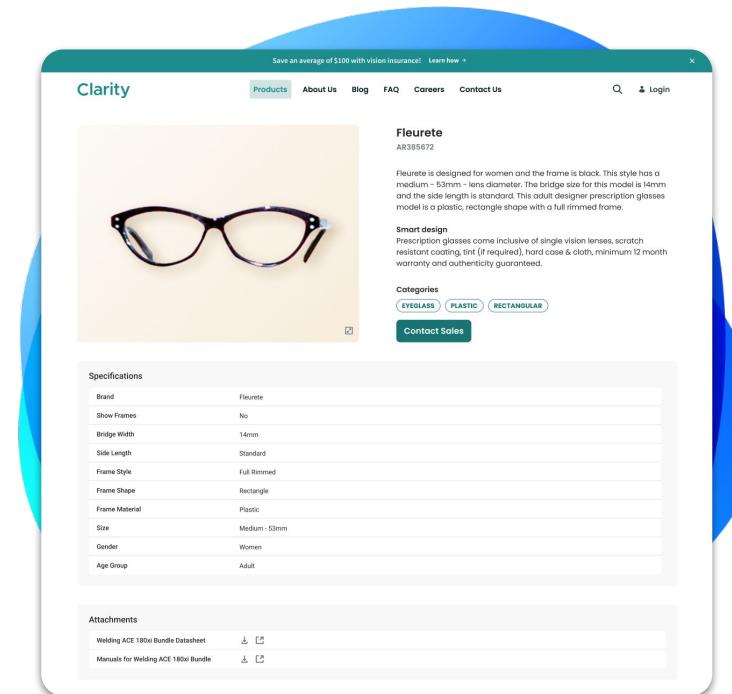
- A product listing page (PLP) is a page on a commerce site that presents a list of products based on a category or search query.
- Sometimes referred to as catalog pages or category pages, they are crucial to successful SEO because they contain a wealth of metadata and links to products
- They address needs of all types of shoppers, both goal-oriented and browsers
- Liferay provides a variety of widgets that allow you to easily compose an effective PLP



## Commerce: Channels, Catalogs and Products

# Product Detail Pages

- A product detail page (PDP) is a page on a commerce site that presents product information such as features, specifications, pricing, images, and related documents
- An effective PDP has a huge effect on both SEO and conversions, turning those browsers into buyers
- PDPs inform and educate your buyers, they help build trust and brand loyalty
- Liferay provides a variety of widgets that allow you to easily compose an effective PDP





## Demo: Quick Tour of Liferay Commerce

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## Exercises #14a - #14e: Commerce Setup and Storefront Buildout

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## Bonus Challenge

### Challenge

Modify the Product Detail Page to reflect the Clarity Vision Solutions design that was shared in the Figma

### Requirements

- Product details, including name, description, specification, and images should be displayed.
- No Add to Cart button should be displayed
- No prices should be displayed

### Success Criteria

Product Detail Page should look like the Figma design



# Lesson 15

## Headless APIs

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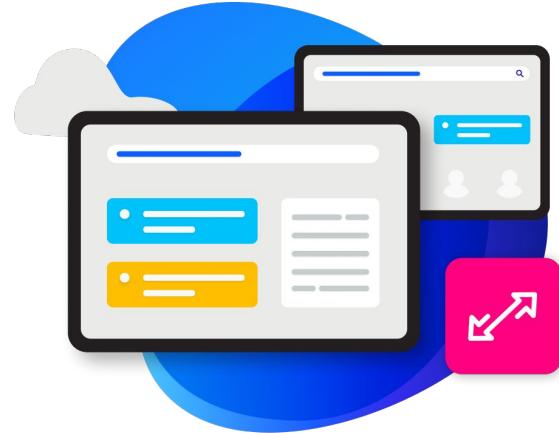
# Clarity Business Requirements

- Migrate content from their legacy content management system
- Import product data from their Product Information Management (PIM) System
- Ensure all imports and exports are done securely



# Introduction to Headless APIs

- Suite of APIs that allow RESTful interaction with Liferay DXP resources
- Promotes decoupling of systems
- Build a UI with any framework while leveraging back-end services
- Easy to consume specification
- Connect securely
- Works naturally with messaging architectures



# Why is Headless Important?

- **Flexibility:** decouple the front-end from the back-end data and logic which allows you to choose the tech you want to work with
- **Performance and Scalability:** lightweight protocols like JSON and GraphQL to get smaller and targeted payloads
- **Omnichannel:** single source of truth for data allowing for content delivery across various channels (web, mobile, etc)
- **Enhanced Developer Experience:** simple to use, well defined interfaces based on open standards leading to less headaches and faster development times
- **Standard Security:** normally leverages OAuth2 which have become the defacto standard for authorizing users



## When are Headless APIs the best option?

# When to use Headless APIs

- Provide services for many of Liferay's key functions (Site Building, Content Authoring and Management, Users and Permissions, etc.)
- Building custom mobile applications
- Migrating data from legacy systems
- Building custom client extensions to interact with Liferay DXP
- Creating automated processes (batch jobs, triggering workflows)
- Requirement for interacting with Liferay DXP from external systems, such as Salesforce or SAP



# **25/ Headless Security**

# Headless Authentication

1

**OAuth2**: supporting password-less access with tokens based on the OpenID connect standards

2

**Basic Authentication**; username and password stored in Liferay. Effective to get up and running quickly but *should not* be used in production

(Not available in Liferay SaaS)



# OAuth2 in Action

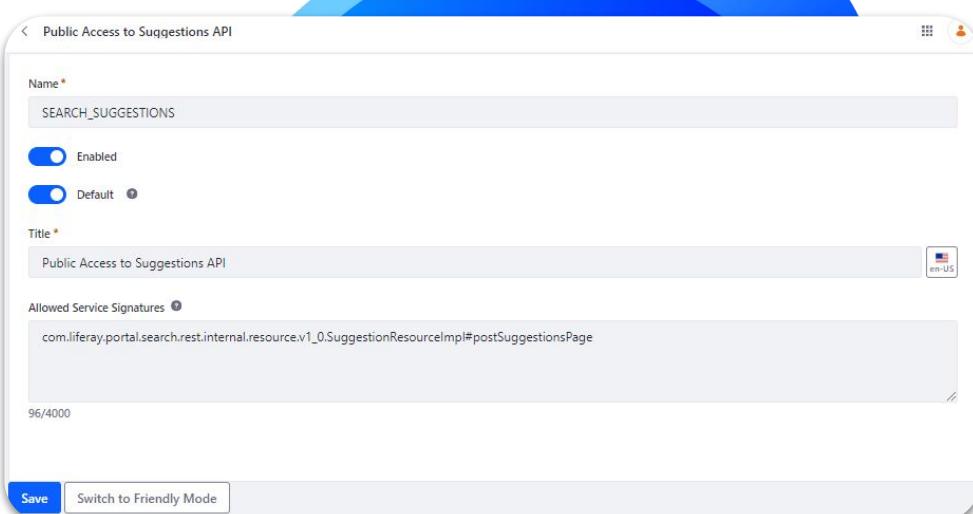
- 1** **Create an OAuth2 Application:** create an application referencing the app that will be accessing the headless API
  
- 2** **Define scopes:** configure the types of access (operations and data) that the application should have access to
  
- 3** **Authorize account:** implement the logic (in the Client Application) to request an authorization (token) from Liferay and use the token to access API



# Guest Access for APIs

Guest allows users to interact with specific APIs without requiring them to login. This can be beneficial for certain scenarios, but it's important to *approach it cautiously* due to security implications.

- By default, Liferay DXP requires authentication to access APIs
- Use **Service Access Policies** to define API access for Guest users
- Specify method signature to allow Guest access in the Allowed Service Signatures





## Exercises #15a - #15b: Configuring OAuth2 for Headless



# **26/ Headless Tools**

# Connecting to Headless

There are no specific software tools explicitly required for connecting to Liferay's headless APIs. However, foundational like network communication, and auth credentials are necessary to interact with the APIs effectively.

- [Liferay's API Explorer](#)
- curl commands
- Postman
- Any other platform tools that provide capability to test RESTful services



## Headless APIs

# Liferay API Explorer

Streamlines API discovery and testing, reducing development time by allowing you to browse functionalities, try API calls, and visualize responses, all within a user-friendly interface.

- Accessible via web browser: `http(s)://[server]:[port]/o/api`
- Request/Response body formats support both JSON and XML
- GET, POST, UPDATE, PATCH, DELETE operations are supported
- All based on OpenAPI standards

The screenshot displays the Liferay API Explorer interface. At the top, a request URL is shown: `http://localhost:8080/o/headless-delivery/v1.0/sites/28119/blog-postings`. Below it, a "Server response" section shows a 200 status code with a JSON response body. The response body contains details about a blog post, including its ID, name, content, and creation date. A large central panel shows a "postSiteBlogPosting" form for creating a new blog post. The form includes fields for "siteId" (a required string parameter) and a "Request body" (application/json type). The "Request body" field is expanded to show a complex JSON schema for a blog post, including fields like "name", "content", and "publishedDate". At the bottom of the form is a blue "Execute" button.

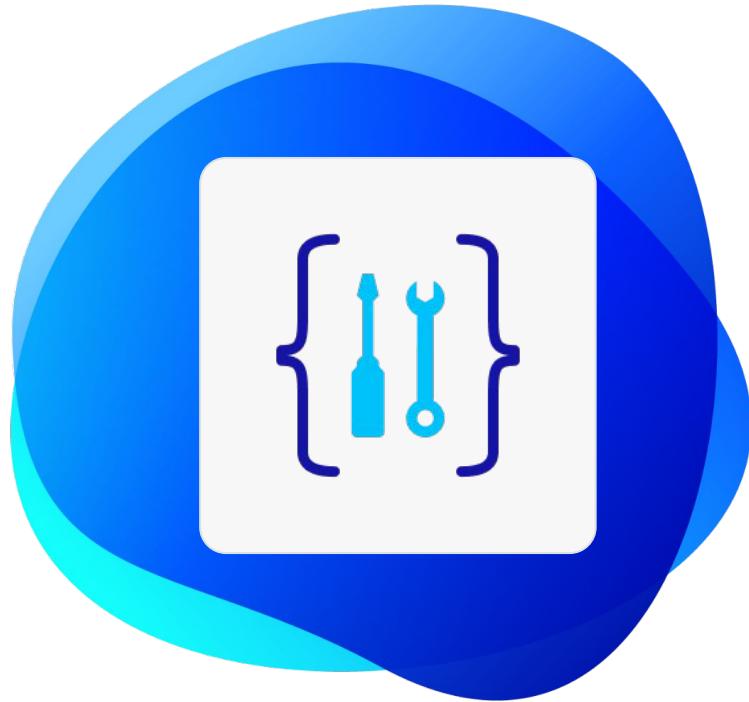


# API Builder

API Builder in Liferay DXP is a feature designed to simplify and streamline the process of creating custom headless APIs without the need to develop or deploy code.

- **API Schema and Endpoint Creation:** define the structure and functionality of your API through user-friendly interfaces
- **Improved Efficiency:** enhance development efficiency by automating code generation and simplifying API definition processes
- **Reduced Coding:** API Builder reduces the need for extensive manual coding compared to traditional API development approaches
- **Currently in BETA**

BETA



# REST Builder vs. API Builder

## REST Builder

- Create -api and -impl projects for the service
- Use configuration files to define the schema and API methods to expose from the service
- Run *buildREST* Gradle task
- REST Builder populates the projects with scaffolding code
- Add implementation logic
- Deploy and test via API Explorer
- **Not supported in Liferay SaaS**

## API Builder

- Access API Builder application via Control Panel
- Click the + button to add a new custom API
- Edit the new custom API and add endpoints
- Specify Retrieve Type, Scope, Path, Description, Schema
- Apply filtering or sorting to the endpoint
- Create the endpoints
- Test via API Explorer
- **Currently behind a Feature Flag**

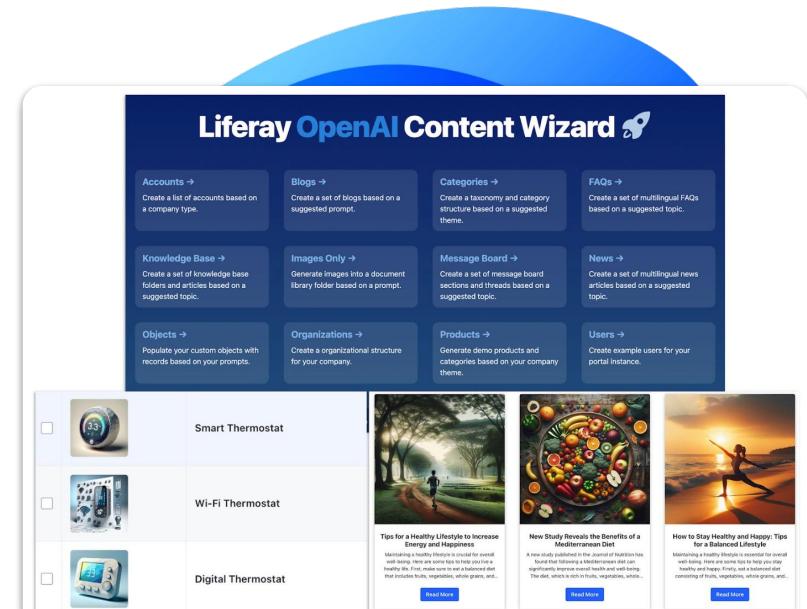


# 27 / Headless in Action

## Headless APIs

# Headless in Action

- External (React) standalone application
- Simple interface allowing users to choose the type of data/content they want to generate
- Input is passed to OpenAI (Chat GPT) which responds with the details
- OpenAI response is then parsed and used in Liferay headless API calls (various endpoints) to load data
- Generate over a dozen content types in Liferay
- FREE - Tool available on Github!



<https://github.com/weskempa-liferay/liferay-openai-demo-wizard>





## Demo: Batch Engine for Importing Content



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Some features may not be available in earlier releases.*



## Exercises #15a - #15d: Importing Data using Headless



# Lesson 16

## Collaborating with Publications and Workflow

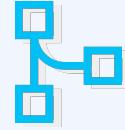
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**Staging**

***or***

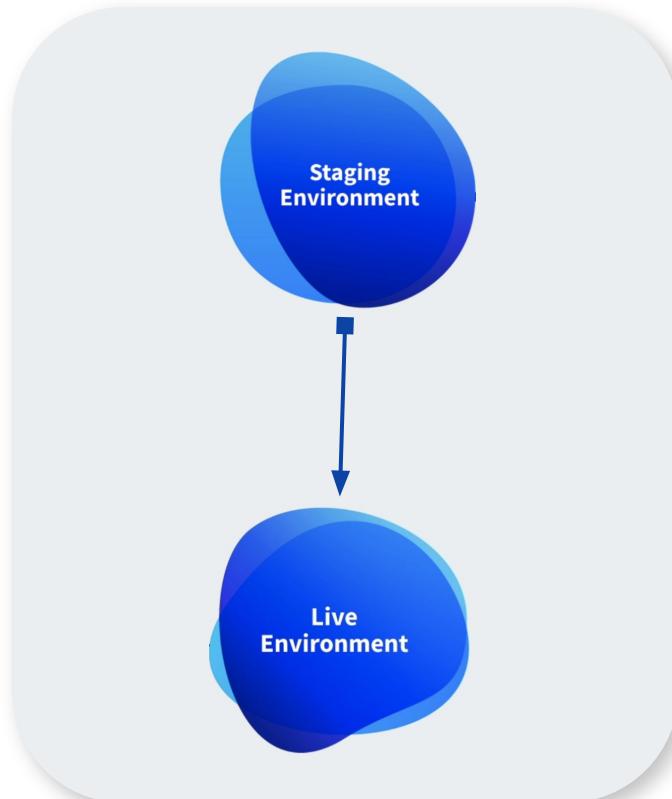


**Publications**



# Providing Staged Content

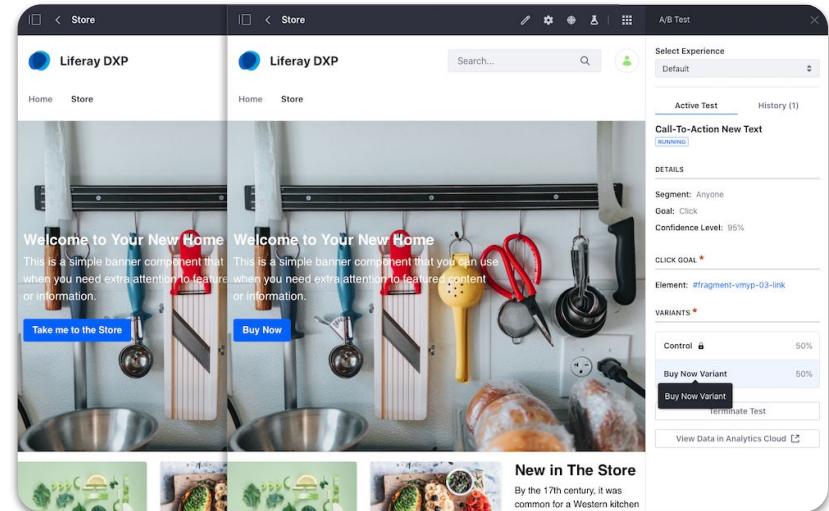
- **Regulatory requirements** that dictate the use of a physically separate environment for testing and publishing content
- **Simple websites with infrequent updates** may benefit from the simpler workflow – basic preview and testing – that comes with *Staging*
- **Inexperience with version control systems and processes** will lead to easier-to-adopt scenarios – however beware that this, as a sole reason, will not age well



## Preview, Collaboration, Publishing and Governance

# Change Management w/ Publications

- Publications should be your first class citizen
- Modern approach that uses a version control-like system that allows branching, merging and tracking changes
- Better collaboration by creating teams (with discrete roles) and tools that foster better communication
- Flexible publishing and streamlined workflow with draft versions, approvals, and scheduling of individual items or entire sets of changes
- Best suited for complex sites with frequent changes managed by multiple teams
- Perfect when granular control over publishing is needed
- Reliable solution for rollback when human error occurs and a revert is necessary



## Preview, Collaboration, Publishing and Governance

# Weighing the Differences

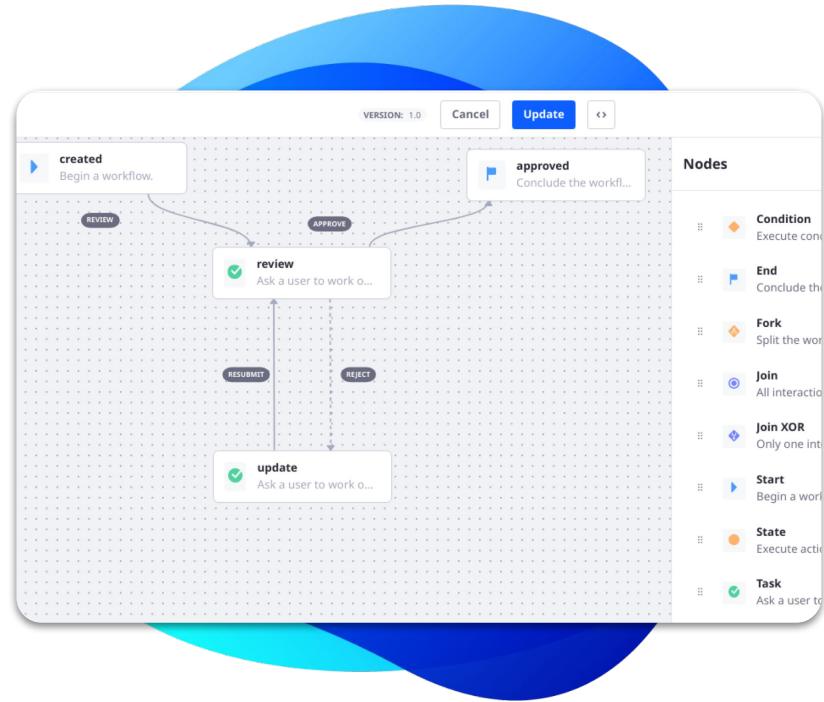
| Capability   | Publications                        | Staging                             |
|--|-------------------------------------|-------------------------------------|
| Host working and production content on separate servers (environments) – security or regulatory requirements | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Create and manage separate working environments for different projects and teams                             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Comment on blocks of changes   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Review differences between working and production environments   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Includes changes from multiple sites or asset libraries in the same working environment                      | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Maintain a detailed history of all published changes   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Revert published changes to content  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Site templates   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |



## Preview, Collaboration, Publishing and Governance

# Workflow

- **Automated tasks;** automate repetitive tasks like approvals, notifications and content routing to save time
- **Reduced errors;** automated steps and rules reduce the risk of human error from manual processes
- **Clear roles and responsibilities;** assign specific tasks and approvals to designated user providing transparency throughout the process
- **Improved communication;** automation of notifications keep stakeholders informed about progress and status
- **Improved review and feedback;** structured review and feedback loops
- **Flexibility;** fully customizable workflows that you can design based on your specific needs
- **Integration;** works seamlessly with other Liferay features including the bulk of Liferay's API.





## Demo: Publications Overview

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## Exercises #16a - #16b: Configuring Publications and Workflow

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# Lesson 17

## Search (Basics)

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# Clarity Business Requirements

- Allow marketing team to design both layout and final rendering of various aspects of the search experience
- Provide a self-service platform for customers to search product documentation, manuals, and troubleshooting guides
- Enable searching content stored in legacy systems that may not be readily accessible
- Deliver personalized search results based on user roles, departments, or previous search history
- Users can refine their searches with filters, facets, and keyword operators



# Search in Liferay

- **API driven feature:** more than one “Search Engine” implementation (or developed as customization)
  - Powerful internal and extensible API used to alter the behavior of indexing actions, queries...
- **Comprehensive Indexing:** supporting wide range of content types
- **Multiple internal (functional) indexes:** to ensure fast results (even with large data sets)
- **Filters, facets and keyword operators:** for highly targeted results
- **Search Bar Suggestions:** Liferay’s Search Bar Suggestions provides search as you type functionality



## Search (Basics)

# Search in Liferay (cont'd)

- **Low-Level Search with Alternate Indexes:** to query external indexes residing in the same cluster and Liferay index
- **Flexible and Template driven UI:**
  - With individual components represent search capabilities to easily design pages
  - Component by component basis to build whatever the business needs
- **Synonyms and Result Rankings:** to configure different terms used to find results and prioritize certain records in result set
- **Blueprints:** to create personalized search results based on user segments



# 28/ Search Pages

## Search (Basics)

# Standard Search in Action

Search Bar

Facets

The screenshot shows a search results page for the term "UV protection". At the top left is a search bar containing "UV protection" with a magnifying glass icon. To its right is a navigation bar with links: Products, About Us, Blog, FAQ, Careers, Contact Us, and a user icon labeled "Login". A pink arrow points from the text "Search Bar" to the search bar. Below the search bar is a facet sidebar titled "Category" with checkboxes for Product, Blog Entry, Job Position, and Documents. A pink arrow points from the text "Facets" to this sidebar. The main content area displays five search results, each consisting of a title ("Search Result Title") and a snippet of text. A pink arrow points from the text "Results Summary" to the first result title. Another pink arrow points from the text "Templated Results" to the second result title.

Global Search

Results Summary

Templated Results



## Search (Basics)

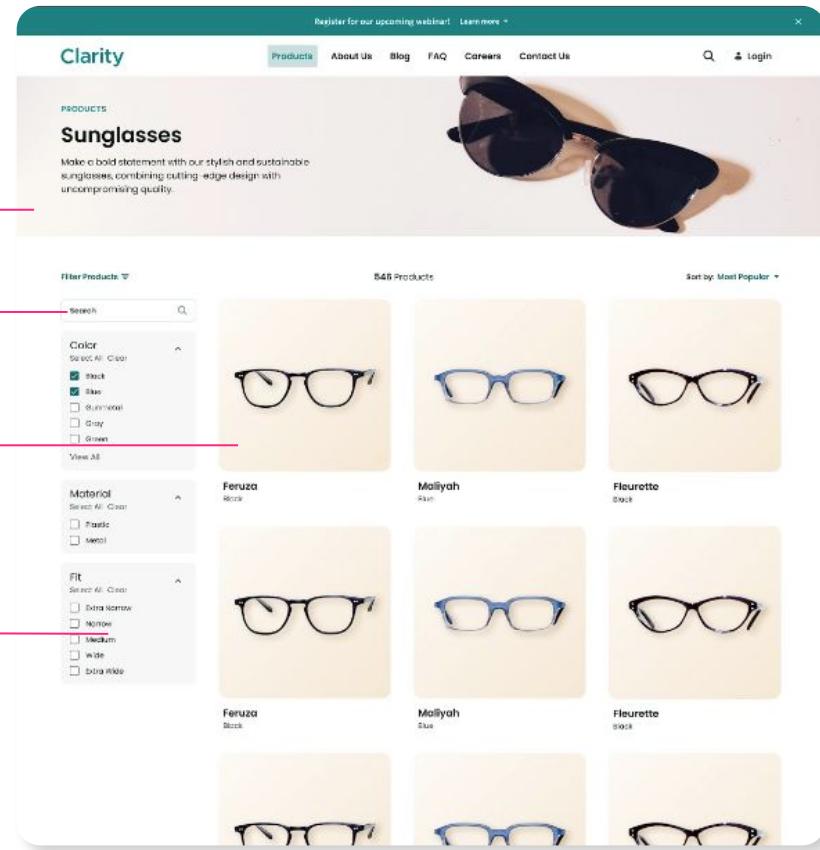
# Specialized Search Pages

Content Placement

Search Bar

Search Results

Facets



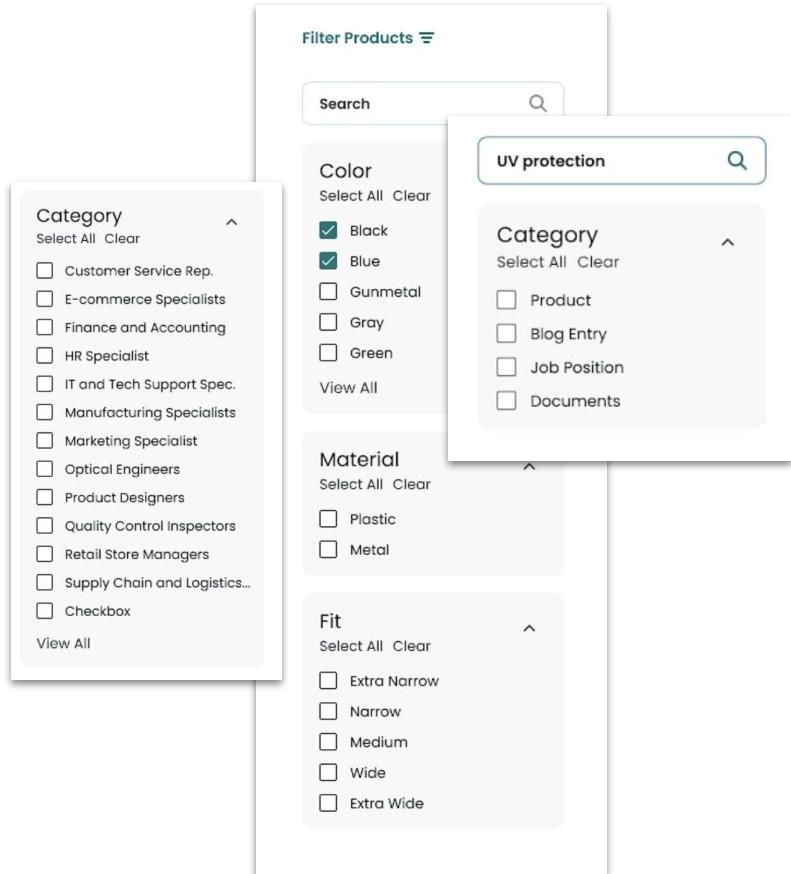
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# 29/ Filtering with Facets

## Search (Basics)

# Facets

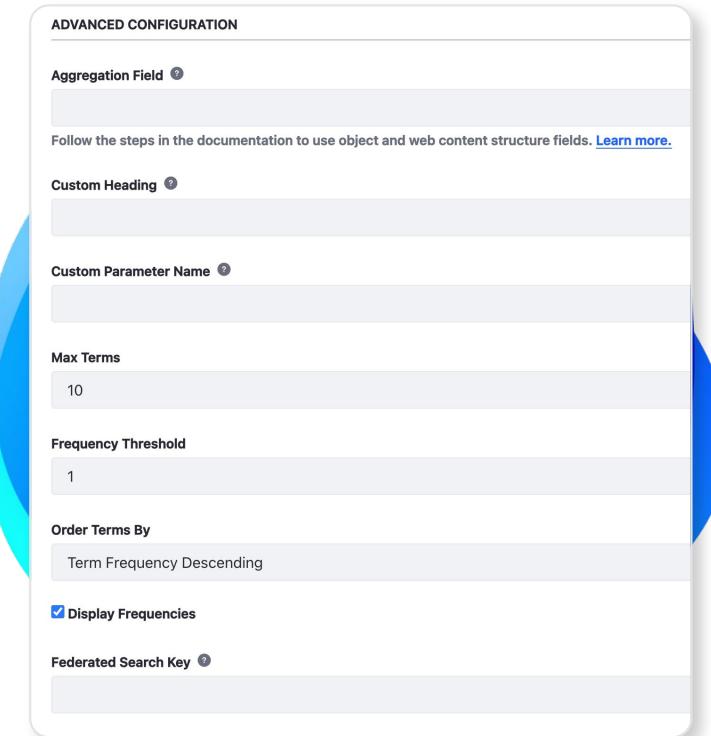
- More than 10 out of the box facets
- Covers most of the common “facet use cases”
  - Eg. Categories, Tags, Dates, Type of Content
- Include several facets related to commerce
- Use Widget configurations to fine tune the values based on business needs
- Support templating engine to allow for custom views



# Custom Facets

Custom facets in Liferay empower you to refine search results beyond predefined options. This fosters deeper content discovery, and enhances the effectiveness of targeted information retrieval.

- Provide a “catch-all” for filters that are not provided out of the box
- Allow Administrators to use advanced configurations to create facets on the fly
- Work with almost any field in the index
- Support templating engine for custom views





## Demo: Using Search & Search Insights





## Exercises #17a - #17c: Building Clarity Search and Job Openings



# Lesson 18

## Search++: Blueprints, Semantics and more

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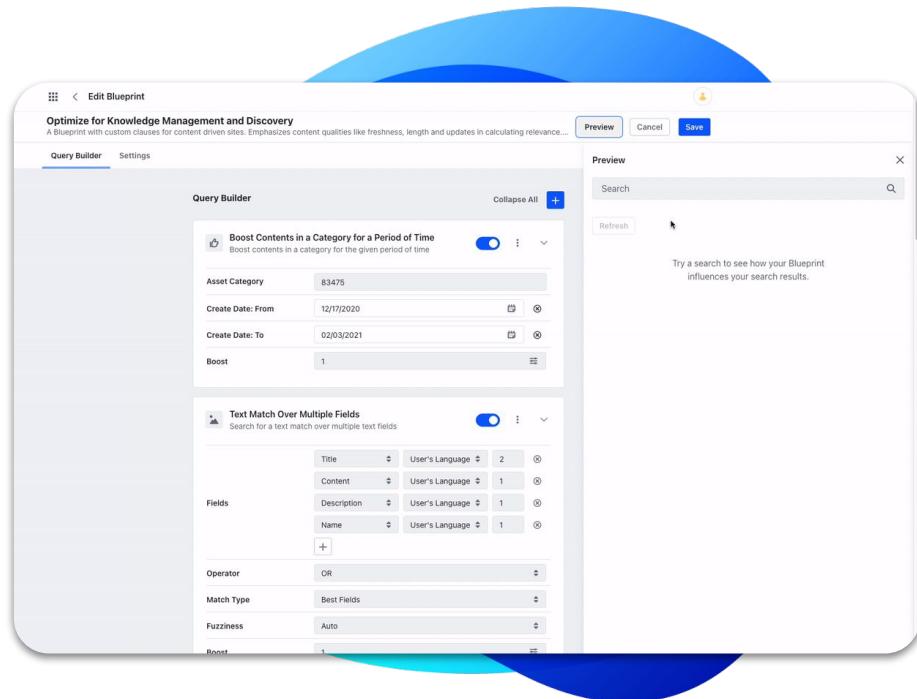


# 30/ Blueprints

# Understanding Search Blueprints

Use Blueprints to tailor the search page experience to your users' needs, without deploying any custom code. Define implicit search criteria that can be added to any User query to delivery the best results, every time.

- Blueprints offers a UI-based configuration experience to create sophisticated custom searches using a no-code approach .
- Magnifies, filters, hides, and displays results on any indexed document field
- Apply different blueprints to each search page or leverage them in Headless API queries



# 31/ Semantic Search

# Search using Content Meaning

Semantic search evaluates the intent behind a searched phrase. Meanwhile, a keyword search matches a searched phrase to the indexed text fields, and cannot produce a match based on meaning.

- Semantic search enables an additional content processing pipeline.
- The platform produces a vector representation of the input text called a text embedding, and stores it in the index document in Elasticsearch.
- At search time, same vectorization and embedding process is performed to provide more meaningfully relevant search results.
- Requires a model trained for your data domain.

## Natural language search phrase

## Regular keyword-based search results

The screenshot shows a search interface with a search bar containing the query "what are the top trending phones". Below the search bar, there are three sections: "SUGGESTIONS", "SEMANTICALLY RELATED", and another unnamed section partially visible. The "SUGGESTIONS" section contains links to news articles about Intel's Unison app and Apple supplier TSMC's sales. The "SEMANTICALLY RELATED" section contains links to news articles about Samsung Galaxy F23 5G and Google's Pixel 7 smartphone launch. A pink vertical line connects the "Natural language search phrase" header to the search bar, and a pink bracket on the right side groups the "SEMANTICALLY RELATED" section under the "Regular keyword-based search results" header.

what are the top trending phones

SUGGESTIONS

Intel's Unison app syncs iOS and Android phones with your PC  
Unison will sync up photos and more. | Image: Intel Intel has announced an intriguing new app called Unison, which aims to "...

Apple supplier TSMC's sales top estimates  
Facial recognition of a sort returned to the latest Google Pixel phones on Thursday after being omitted on previous phones due...

SEMANTICALLY RELATED

This 5G smartphone from Samsung is selling at its 'lowest-ever' price  
Samsung Galaxy F23 5G is a mid-range 5G smartphone powered by Qualcomm Snapdragon 750G chipset. The handset was la...

Google says Pixel 6 and 6a are its 'fastest-selling' phones yet, but Pixel 3 is the best-selling  
Ahead of its Pixel 7 launch yesterday, Google proudly announced that the Pixel 6 with the addition of the Pixel 6a, the series ha...

Google launches £599 Pixel 7 smartphone and £349 Pixel Watch  
Unveiled at its Made By Google event in New York on Thursday, Pixel 7 is Google's "most powerful phone yet", packed with th...

## Semantic results

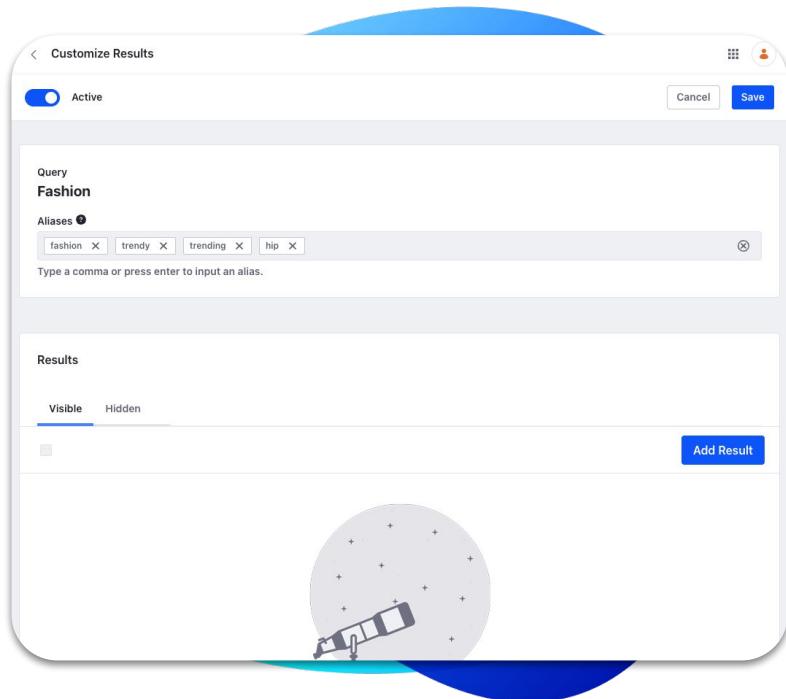


## 32/ Additional Search Tools

# Result Rankings

Result rankings in Liferay allow you to steer users by prioritizing search results for specific keywords, ensuring the most relevant content surfaces first.

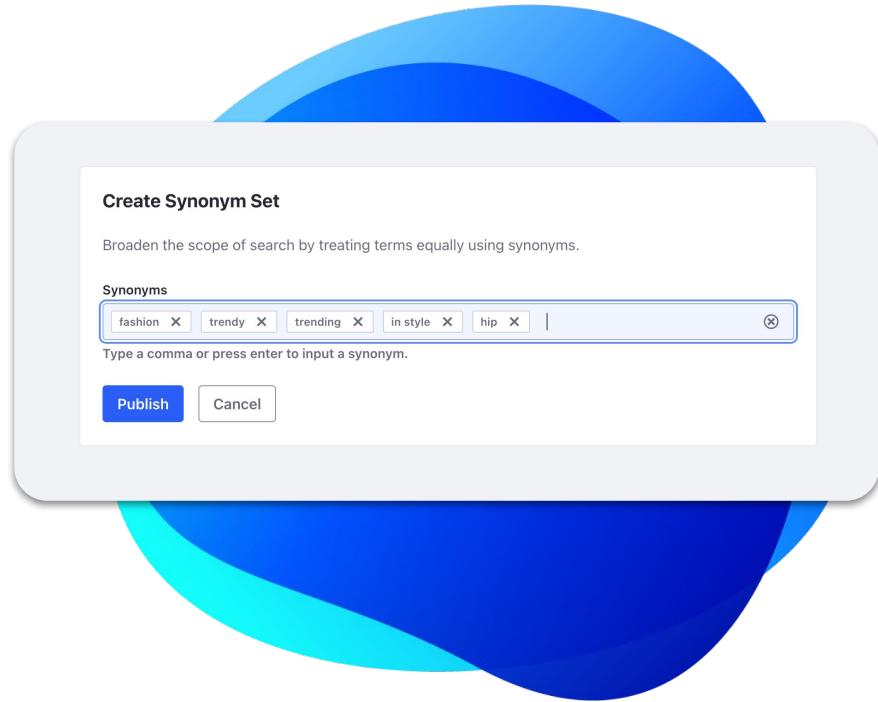
- **Enhanced Content Visibility:** high-priority content, like FAQs, or product information appear at the top of search results.
- **Boosted User Engagement:** Faster discovery of relevant content leads to more engaged users.
- **Targeted Information Delivery:** Result rankings allow you to tailor search results to specific user groups or audiences.



# Synonyms

Synonyms promote information discovery and search reach by capturing variations in user queries. This ensures users find relevant content even if they don't use the exact keywords.

- **Enhanced Search Accuracy:** Synonyms capture variations in user queries, like singular vs. plural forms, abbreviations, or related terms.
- **Reduced Support Costs:** By ensuring users find the information they need through search.
- **Multilingual Support:** Synonyms can be defined for different languages, ensuring users searching in their preferred language still find relevant content.





## Demo: Search Toolkit



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## Exercises #18a - #18c: Search Experiences and Blueprints



# Answers Questions?

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# Next Up

## What's Next?

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