



Day 1 exercises for
**Building Enterprise
Websites with Liferay**

Bootcamp 2024

Exercises for Building Enterprise Websites with Liferay, 2024.Q2 Bootcamp, Day 1

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Exercise 1: Exploring Clarity's Public Enterprise Website

Throughout this training, you'll help build an enterprise marketing website for Clarity Vision Solutions. This site is intended to increase brand awareness, showcase their products, and convert visitors to customers. Instead of starting from scratch, we've provided a Liferay workspace that includes a partially complete version of Clarity's site that you'll finish throughout the training. Along the way, you'll take on different Clarity personas to demonstrate how they can contribute to Clarity's solution.

Before moving on to the next lesson,

1. Review Clarity's [Figma designs](#) to get an idea of the site you're building.
2. Visit <https://clarityvisionsolutions.com> to explore a complete implementation of the site on Liferay.

Exercise 2: Verifying and Launching Liferay Workspace

As you prepare to build Clarity's enterprise website, ensure you've followed the [Enablement Bootcamp Prerequisite](#) to set up the training workspace:

1. Open your terminal and verify you have Java JDK 11.

```
java -version
```

If you don't have Java 11 installed, see [Microsoft OpenJDK installation](#) for instructions according to your OS.

Note: Some students have encountered issues with JDK 11.0.2, so we recommend using an early or later version.

2. (Optional) Verify Liferay Blade CLI is installed:

```
blade version
```

If you don't have Blade installed, run this command:

```
curl -L https://raw.githubusercontent.com/liferay/liferay-blade-cli/master/cli/installers/local | sh
```

Note: Liferay Blade CLI can help simplify terminal commands for Liferay workspaces but is not necessary for this training. You can use Gradle Wrapper commands instead.

3. Verify Git is installed:

```
git version
```

If Git is not installed, see [Git's official documentation](#) for how to install it on your OS ([macOS](#) | [Windows](#) | [Linux/Unix](#)).

4. In your terminal, go to your desired folder and clone the training workspace to your computer:

```
git clone https://github.com/liferay/enablement-bootcamp-clarity.git
```

This saves a copy of the project in your current terminal directory.

Note: If you've cloned the repo previously, ensure your workspace is up to date by running `git pull origin main`.

5. Go to the workspace's root folder in your terminal:

```
cd enablement-bootcamp-clarity/
```

6. Initialize your Liferay bundle:

```
blade server init
```

If you don't have Blade installed, run this command:

- **Unix-based systems:**

```
./gradlew initBundle
```

- **Windows:**

```
.\gradlew.bat initBundle
```

This downloads and builds dependencies for running Liferay, including the Liferay server.

7. Start your Liferay server:

Blade:

```
blade server run
```

- **Unix-based systems:**

```
./bundles/tomcat/bin/catalina.sh run
```

- **Windows:**

```
.\bundles\tomcat\bin\catalina.bat run
```

8. When finished, access your Liferay DXP instance by going to <http://localhost:8080/> in your browser.

9. Sign in using these credentials:

- Username: admin@clarityvisionsolutions.com
- Password: [learn](#)

10. Take some time to explore the site and resources included in the training workspace.

Now you're ready to start contributing to Clarity's public enterprise website!

Exercise 3a: Creating Users

While building the public enterprise website, we'll follow these Clarity personas as they contribute to the final site:

Screen Name	Email	First Name	Last Name	Job Title
christiancarter	christian.carter@clarityvisionsolutions.com	Christian	Carter	Marketing Coordinator
claramurphy	clara.murphy@clarityvisionsolutions.com	Clara	Murphy	Marketing Manager
harperroberts	harper.roberts@clarityvisionsolutions.com	Harper	Roberts	Human Resources Specialist
ianmiller	ian.miller@clarityvisionsolutions.com	Ian	Miller	IT Manager
walterdouglas	walter.douglas@clarityvisionsolutions.com	Walter	Douglas	Web Developer

IT Personas



Ian Miller
ROLE
IT Manager



Walter Douglas
ROLE
Web Developer

Business Personas



Clara Murphy
ROLE
Marketing Manager



Christian Carter
ROLE
Marketing Coordinator



Harper Roberts
ROLE
HR Specialist

The training workspace already includes all of these users except for Christian Carter. Here you'll add him manually as the Clarity Admin user.

Note: In real world scenarios, large organizations like Clarity would benefit from using an identity and access management system (e.g., Okta) to add users to their Liferay instance. For training purposes, you'll create the missing user manually.

To do this,

1. Open the *Global Menu* (grid icon), go to the *Control Panel* tab, and click *Users and Organizations*.

The screenshot shows the Liferay Control Panel interface. At the top, there are tabs for Applications, Commerce, and Control Panel. On the right, there's a sidebar titled 'SITES' with options: Clarity (CURRENT), Clarity, and Global. The main content area has sections for USERS, ACCOUNTS, SECURITY, OBJECT, and SYSTEM. The 'USERS' section is expanded, showing 'Users and Organizations' (which is highlighted with a yellow box), User Groups, Roles, Monitoring, Service Accounts, and Site Templates. The 'ACCOUNTS' section includes Accounts, Account Users, and Account Groups. The 'SECURITY' section lists Audit, OAuth Client Administration, OAuth 2 Administration, Password Policies, SAML Admin, Service Access Policy, and more. The 'OBJECT' section contains Objects, Picklists, and SYSTEM. The 'SYSTEM' section includes Server Administration, Gogo Shell, Virtual Instances, and On-Demand Admin. The 'NOTIFICATIONS' section lists Templates and Queue. The 'MARKETPLACE' section includes License Manager. At the bottom left, it says 'Liferay DXP'.

Here you can view and manage all users for the current Liferay instance. This should include the Clarity Admin user along with Walter Douglas, Ian Miller, Clara Murphy, and Harper Roberts.

The screenshot shows the 'Users and Organizations' list page. At the top, there are tabs for 'Users' (selected) and 'Organizations'. Below that is a search bar with a 'Filter' and 'Order' dropdown, and a 'New' button. The main table has columns: Name, Screen Name, Job Title, Organizations, and User Groups. The table contains five rows, each with a checkbox and three dots at the end. The entire table is highlighted with a yellow box.

Name	Screen Name	Job Title	Organizations	User Groups
<input type="checkbox"/> Clarity Admin	clarityadmin			
<input type="checkbox"/> Walter Douglas	walterdouglas	Web Developer	IT	
<input type="checkbox"/> Ian Miller	ianmiller	IT Manager	IT	
<input type="checkbox"/> Clara Murphy	claramurphy	Marketing Manager		
<input type="checkbox"/> Harper Roberts	harperroberts	Human Resources Specialist	Human Resources	

2. Click *New*.

3. To set the user's profile image, click the *Change Image* button (), click *Select*, navigate to the [repository-folder]/exercises/lesson-3/ folder in the training workspace, select christian-carter.png, and click *Done*.

USER DISPLAY DATA



Image

christian-carter.png

4. Enter these details for Christian Carter:

Field	Value
Screen Name	christiancarter
Email Address	christian.carter@clarityvisionsolutions.com
Job Title	Marketing Coordinator
First Name	Christian
Last Name	Carter

Screen Name *

Email Address *

PERSONAL INFORMATION**Language**

English (United States)

Job Title

Marketing Coordinator

Prefix**Birthday**

01/01/1970

First Name *

Christian

Middle Name**Last Name ***

Carter

5. Click *Save*.

You can now access additional configuration options for Christian Carter.

6. In the left menu, click *Password*.

7. Enter **Learn** for his password.

The screenshot shows the 'Edit User Christian Carter' page in Liferay. The left sidebar has tabs for General, Contact, Preferences, and a highlighted Password tab. The main content area is titled 'Password'. It contains fields for 'New Password *' and 'Reenter Password *', both of which are highlighted with a yellow box. Below these fields is a checkbox for 'Require Password Reset'. Further down is a 'WEBDAV PASSWORD' section with a note about generating a password, a 'Generate WebDAV Password' button, and 'Save' and 'Cancel' buttons.

8. Click *Save*.

Great! You've added Christian Carter to Clarity's Liferay instance. Next you'll create a user group to help organize and manage Clarity's users.

Exercise 3b: Creating and Assigning User Groups

In a real-world scenario, organizations like Clarity have hundreds of users, and managing them individually is impossible. To help reduce the burden of user management, Liferay provides user groups for easily assigning roles to related users. The next exercise will explore roles in more detail.

To begin with, Clarity needs these user groups:

Group Name	Description
Human Resources	Members of the human resources department at Clarity.
IT	Members of the IT department at Clarity.
Marketing	Members of the marketing department at Clarity.

The training workspace includes both the IT and Human Resources user groups. Here you'll create and assign Clarity's *Marketing* user group as the Clarity Admin user.

To do this,

1. Open the *Global Menu* (grid icon), go to the *Control Panel* tab, and click *User Groups*.

User Groups		
<input type="checkbox"/> <input type="button" value="New"/>		Search for
User Groups		
Name	Description	Users
<input type="checkbox"/> Human Resources	Members of the human resources department at Clarity	1 <input type="button" value="More"/>
<input type="checkbox"/> IT	Members of the IT department at Clarity.	2 <input type="button" value="More"/>

2. Click *New*.

3. Enter these details for the user group:

Field	Value
Name	Marketing
Description	Members of the marketing department at Clarity.

< New User Group

Name*
Marketing

Description
Members of the Marketing department at Clarity
46/4000

4. Click *Save*.

This creates the user group, so you can now add Clarity's marketing users to it.

5. Click the *Marketing* user group.

6. Click *New*.

7. Select *Christian Carter* and *Clara Murphy*.

Name	Screen Name
<input type="checkbox"/> Clarity Admin	clarityadmin
<input checked="" type="checkbox"/> Christian Carter	christiancarter
<input type="checkbox"/> Walter Douglas	walterdouglas
<input type="checkbox"/> Ian Miller	ianmiller
<input checked="" type="checkbox"/> Clara Murphy	claramurphy
<input type="checkbox"/> Harper Roberts	harperroberts

20 Entries ▾ Showing 1 to 6 of 6 entries.

8. Click *Add*.

Great! Now any roles assigned to the Marketing user group are automatically assigned to all team members. Next, you'll learn how to define and assign custom roles for Clarity.

Exercise 3c: Creating and Assigning User Roles

Each Clarity persona belongs to different teams with different responsibilities. You can use Liferay roles to model this structure. A role is a list of permissions that empower users to perform specific actions within the Liferay instance.

While Clarity can leverage many of Liferay's OOTB roles, they also want these custom roles:

Type	Title	Description
Regular	Content Manager	Clarity role for those managing content on Liferay.
Regular	IT Manager	Clarity role for a manager within the IT department.
Regular	Web Developer	Clarity role for a front end developer within the IT Department.
Regular	Marketing Coordinator	Clarity role for an individual contributor from the marketing team.
Site	Site Content Contributor	Site based role for those contributing to the Clarity site.

The training workspace includes all of these roles except for Marketing Coordinator. Here you'll create and assign the Marketing Coordinator role as the Clarity Admin user.

To begin,

1. Open the *Global Menu* (grid icon), go to the *Control Panel* tab, and click *Roles*.
2. Click *New*.
3. Enter these details for the role:

Field	Value
Type	Regular
Title	Marketing Coordinator
Description	Clarity role for an individual contributor from the marketing team.
Key	Marketing Coordinator

New Role

Type: Regular

Title: Marketing Coordinator

Description: Clarity role for an individual contributor from the marketing team.

Key: Marketing Coordinator

Save Cancel

4. Click *Save*.

This creates the role, so you can add permissions and assign it to users. Since this role should apply to all marketing team members, you can assign it to the Marketing user group.

5. Go to the *Assignees* tab and click *User Groups*

Marketing Coordinator

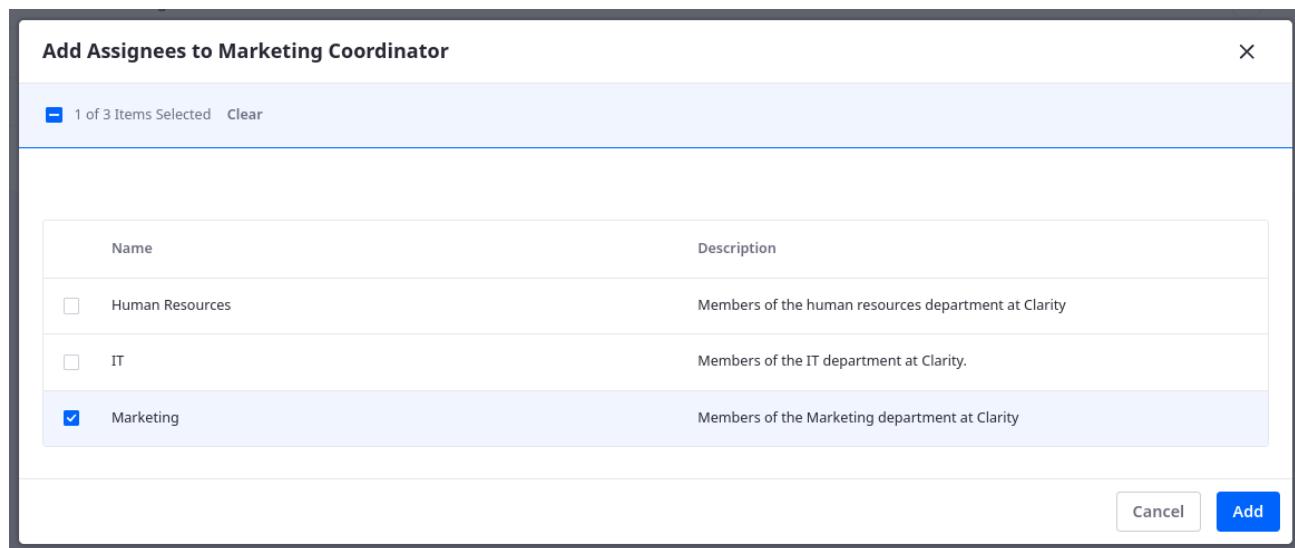
Details Define Permissions Assignees

Users Sites Organizations User Groups Segments

Search for New

6. Click *New*.

7. Select *Marketing*.



8. Click *Add*.

Great! You've created and assigned a role to Clarity's marketing users. However, the role doesn't have any permissions yet. Next, you'll add permissions to the role. This enables anyone with the role to fulfill their responsibilities in the Clarity website.

Exercise 3d: Defining Role Permissions

Permissions grant the ability to access data and perform specific actions in a Liferay instance. Now that you've created the Marketing Coordinator role, you'll start adding specific permissions associated with the role as the Clarity Admin user.

Throughout this process, you'll impersonate Christian Carter to see the practical effect of granting the Marketing Coordinator role additional permissions.

To do this,

1. Open the *Global Menu* (grid icon), go to the *Control Panel* tab, and click *Users and Organizations*.
2. Click *Actions* (grid icon) for Christian Carter and select *Impersonate User*.

Name	Screen Name	Job Title	Organizations	User Groups
<input type="checkbox"/> Clarity Admin	clarityadmin			
<input type="checkbox"/> Christian Carter	christiancarter	Marketing Coordinator		Marketing
<input type="checkbox"/> Walter Douglas	walterdouglas	Web Developer		
<input type="checkbox"/> Ian Miller	ianmiller	IT Manager		
<input type="checkbox"/> Clara Murphy	claramurphy	Marketing Manager		
<input type="checkbox"/> Harper Roberts	harperroberts	Human Resources Specialist		

Edit Permissions Deactivate Delete Personal Data Export Personal Data

This opens a new tab where you can view the Liferay instance using Christian Carter's permissions.

Notice how he doesn't have access to any of the applications or resources he needs as a marketing coordinator.

The screenshot shows a Liferay DXP application interface. At the top left is the Liferay logo. To its right is a search bar with placeholder text "Search..." and a magnifying glass icon. Further right is a user profile icon. Below the header, the word "Home" is visible. The main content area features a large, stylized blue tree illustration with various icons (charts, play button, document) integrated into its branches. To the left of the tree, the text "Welcome to the Enablement Bootcamp" is displayed, followed by the subtitle "Building Enterprise Websites with Liferay DXP". In the bottom right corner of the main content area, there is a small note: "Clarity needs all Marketing Coordinators to have access to assets in the team's asset library." The overall theme is digital marketing and website development.

Clarity needs all Marketing Coordinators to have access to assets in the team's asset library.

3. Return to the Clarity Admin tab, go to the *Roles* application, and click the *Marketing Coordinator* role to begin editing it.
4. Go to the *Define Permissions* tab.
5. In the left menu, go to *Applications Menu* → *Content* → *Asset Libraries*.

Tip: Enter "Asset Libraries" into the search bar to quickly locate this section.

6. Select these permissions:

Section	Permission
Application Permissions	Access in Control Panel
Application Permissions	View
Resource Permissions > Asset Library Entry	View Site and Asset Library Administration Menu

7. Click *Save*.

This updates the Marketing Coordinator role's permissions.

Note: Liferay automatically assigns the **Portal: View Control Panel Menu** permission when you grant the **Access in Control Panel** permission.

8. Refresh the tab where you're impersonating Christian Carter.

Now he can access the Asset Libraries application in the Global Menu (grid icon).

9. Go to the *Asset Libraries* application.

Although Christian Carter can access the application, he cannot view or access any libraries included in the bootcamp workspace:

- Error Pages
- HR
- Leadership
- Legal
- Marketing Assets
- Product Images

Since Christian Carter and other marketing team members need access to the Marketing Assets library, let's grant them membership using the Marketing user group.

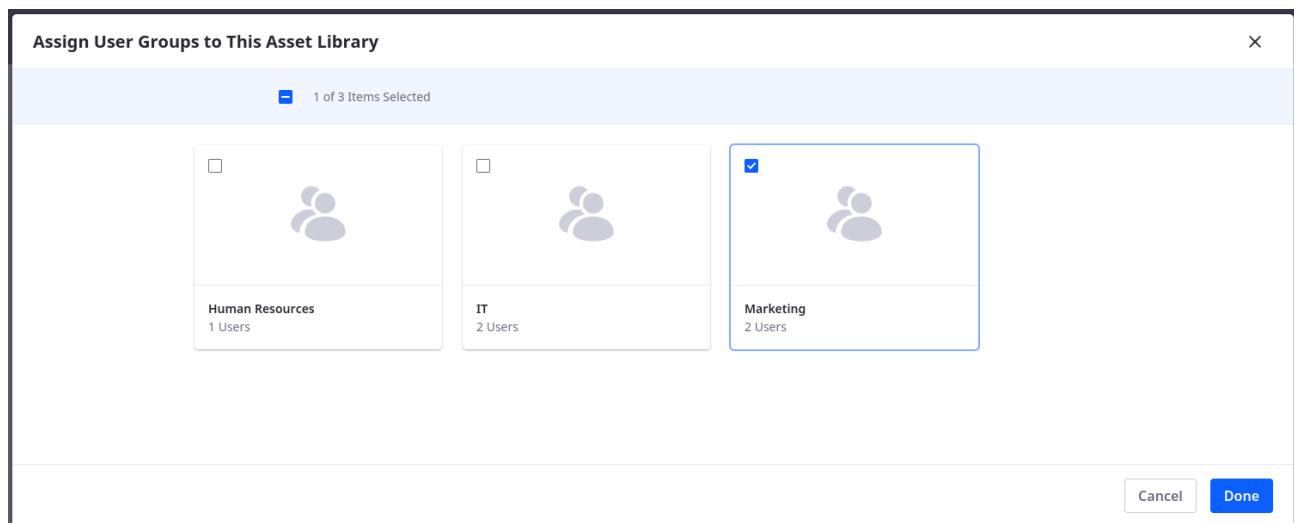
10. Return to the Clarity Admin tab.

11. In the Global Menu, go to *Asset Libraries* and click *Marketing Assets*.

12. Click *Memberships* and go to the *User Groups* tab.

13. Click *New*.

14. Select *Marketing* and click *Done*.



15. Refresh the tab where you're impersonating Christian Carter.

Now he can access the Marketing Assets library, but he still cannot access the library's applications or data.

To solve this, let's assign the default Asset Library Administrator role to the Marketing user group.

16. Return to the Clarity Admin tab.

17. Click *Actions* () for the Marketing user group and select *Assign Roles*.

The screenshot shows the 'Memberships' section of the Liferay Admin interface. A table lists a single membership entry for 'Marketing'. The 'Roles' column shows 'Asset Library Administrator'. A context menu is open next to the entry, with the 'Assign Roles' option highlighted by a yellow box.

Here you can select from available asset library roles. These roles grant permissions for individual libraries.

18. Select the *Asset Library Administrator* role and click *Done*.

19. Refresh the tab where you're impersonating Christian Carter.

Now he can access the library's applications.

The screenshot shows the 'Marketing Assets' library interface. It displays three application tiles: 'Web Content', 'Documents and Media', and 'Translation Processes'. Below these is a 'SITE BUILDER' section containing a 'Collections' tile.

Although Christian Carter can access the library's applications, he doesn't have the application permissions necessary for fulfilling his responsibilities (e.g., uploading documents, editing articles).

Let's add these permissions to the Marketing Coordinator role.

20. Return to the Clarity Admin tab, go to the *Roles* application, and click the *Marketing Coordinator* role to begin editing it.

21. Go to the *Define Permissions* tab.

22. In the left menu, go to *Site and Asset Library Administration* → *Content & Data* → *Documents and Media*.

Note: If you search "Documents and Media," two options appear with the same name. Select the option under Content & Data.

23. Select these permissions:

Section	Permission
General Permissions	Access in Site and Asset Library Administration

Section	Permission
General Permissions	View
Resource Permissions > Documents	Add Document
Resource Permissions > Documents	Add Folder
Resource Permissions > Documents	Update
Resource Permissions > Documents	View
Resource Permissions > Documents Folder	View

24. Click *Save*.

25. In the left menu, go to *Site and Asset Library Administration* → *Content & Data* → *Web Content*.

Note: If you search "Web Content," two options appear with the same name. Select the option under Content & Data.

26. Select these permissions:

Section	Permission
General Permissions	Access in Site and Asset Library Administration
General Permissions	View
Resource Permissions > Web Content	Add Folder
Resource Permissions > Web Content	Add Structure
Resource Permissions > Web Content	Add Template
Resource Permissions > Web Content	Add Web Content
Resource Permissions > Web Content	Update
Resource Permissions > Web Content	View
Resource Permissions > Web Content Article	Update
Resource Permissions > Web Content Structure	View
Resource Permissions > Web Content Template	View

27. Click *Save*.

28. In the left menu, go to *Site and Asset Library Administration* → *Categorization* → *Categories*.

29. Select these permissions:

Section	Permission
Resource Permissions > Asset Categories	Add Category
Resource Permissions > Asset Categories	Add Vocabulary

30. Refresh the tab where you're impersonating Christian Carter.

He can now perform all content actions necessary for his responsibilities (e.g., create and edit web content). Next, marketing coordinators need the ability to update site pages.

31. Return to the Clarity Admin tab.

32. In the left menu, go to *Site and Asset Library Administration* → *Site Builder* → *Pages*.

Action	Scope
<input type="checkbox"/> Access in Site and Asset Library Administration	All Sites and Asset Libraries <input type="checkbox"/> Change
<input type="checkbox"/> Add to Page	All Sites and Asset Libraries <input type="checkbox"/> Change
<input type="checkbox"/> Configuration	All Sites and Asset Libraries <input type="checkbox"/> Change
<input type="checkbox"/> Permissions	All Sites and Asset Libraries <input type="checkbox"/> Change
<input type="checkbox"/> Preferences	All Sites and Asset Libraries <input type="checkbox"/> Change
<input type="checkbox"/> View	All Sites and Asset Libraries <input type="checkbox"/> Change

33. Select this permission.

Section	Permission
Resource Permissions > Page	Update

34. Click *Save*.

35. Refresh the tab where you're impersonating Christian Carter.

Notice that he can now access edit tools for site pages.

Well done! Now all members of the Marketing user group have the correct base permissions. By assigning additional roles, Clarity can ensure they have access to the applications and data they need.

Next, you can opt to learn more about roles and user permissions by creating a manager role. Otherwise, you can move to Lesson 4 and explore how to create and configure sites.

Exercise 3e: Fine Tuning Manager Permissions (Bonus)

So far you've been using the Clarity Admin user to make changes. This user is the omni-administrator and has all Liferay permissions. In real world scenarios, companies should strictly guard access to this user and greatly restrict which users have full admin privileges. Companies like Clarity should set up manager roles that only have the permissions necessary for their responsibilities.

Here you'll set up a management group that has authority to configure permissions for their team members, without granting them full admin privileges as the Clarity Admin user.

To do this,

1. Go to the *User Groups* application in the Global Menu.
2. Create a **Marketing Managers** user group.
3. Add Clara Murphy to the group.
4. Go to the *Roles* application in the Global Menu.
5. Create a **Marketing Manager** role.
6. While editing the *Marketing Manager* role, go to the *Define Permissions* tab.
7. In the left menu, go to *Control Panel* → *Users* → *User Groups*.
8. Select this permission:

Section	Permission
Application Permissions	Access in Control Panel

9. Click *Save*.
10. In the left menu, go to *Control Panel* → *Users* → *Users and Organizations*.
11. Select this permission:

Section	Permission
Resource > User	View

12. Click *Save*.
13. Go to the *Assignees* tab and assign this role to the *Marketing Managers* user group.

These permissions grant the ability to view the User Groups application and view users. Next, you'll give the Marketing Manager role permission to view and add members for the Marketing user group.

14. Go to the *User Groups* application in the Global Menu.
15. Click *Actions* () for the Marketing user group and select *Permissions*.

The screenshot shows the Liferay User Groups application. On the left, there's a list of user groups: 'Marketing' (selected), 'Marketing Managers', and 'Marketing Managers at Clarity'. The 'Marketing' group is highlighted with a yellow box. On the right, a context menu is open for the selected group, with 'Permissions' highlighted by a yellow box and an arrow pointing to it.

16. For the Marketing Manager role, select these permissions and click *Save*:

Role	Permission
Marketing Manager	Assign Members
Marketing Manager	View Members
Marketing Manager	View

Role	Delete	Permissions	Assign Members	View Members	Manage Announcements	Update	View
Analytics Administrator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content Manager	<input type="checkbox"/>						
Guest	<input type="checkbox"/>						
IT Manager	<input type="checkbox"/>						
Marketing Coordinator	<input type="checkbox"/>						
Marketing Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Owner	<input checked="" type="checkbox"/>						
Portal Content Reviewer	<input type="checkbox"/>						

17. Go to the *Users and Organizations* application in the Global Menu.

18. Impersonate Clara Murphy to verify the Marketing Manager role permissions.

Clara should see the Marketing user group. She should also be able to view members of the user group and add new members to the group.

The screenshot shows the Liferay Users and Organizations application. At the top, there's a search bar and a 'New' button. Below that, the 'User Groups' section is shown, with 'Marketing' selected. The table lists two users: 'Christian Carter' and 'Clara Murphy', each with their respective screen names and edit options.

Name	Screen Name	More Options
Christian Carter	christiancarter	⋮
Clara Murphy	claramurphy	⋮

Note: This is just an example of the types of permissions you can assign to manager roles.

Great! For now, you've finished setting up Clarity's users, user groups, and roles. Next, we'll turn our attention to Clarity's website.

Exercise 4a: Creating a Site

When you create a site, you can start from scratch or select from available templates and initializers. The training workspace includes a prebuilt site, Clarity Public Enterprise Website. However, to see what the site creation process looks like, let's create a new test site as Ian Miller.

To do this,

1. Sign in as Ian Miller, Clarity's IT manager.
 - Username: `ian.miller@clarityvisionsolutions.com`
 - Password: `learn`

Note: So far we've used Clarity's administrator user, which has complete control over the Liferay instance. In practice, it's best to limit the use of such high-level accounts to ensure optimal security.

2. Open the *Global Menu* (), go to the *Control Panel* tab, and click *Sites*.
3. Click *New*.
4. Select the *Blank Site* template.
5. Enter `Clarity Distributor Portal` for name.
6. Click *Add*.

This creates a new empty site and redirects you to its configuration page.

Clarity could use this site to build a channel for selling products to their distributors. But for this course, we'll focus on optimizing the *Clarity Public Enterprise Website*.

Next, you'll learn about site membership and how you can grant users site specific roles.

Exercise 4b: Adding Users to a Site

By default, when you create a public site, all unauthenticated visitors can view its public pages and content. For authenticated site members, you can grant additional privileges using site-scoped roles. While most users in your training workspace are already members of the enterprise website, Christian Carter and Harper Robert are not.

Here you'll add them to the site as Ian Miller.

To do this,

1. Open the *Global Menu* ()) and select *Clarity Public Enterprise Website* in the right panel.
2. Open the *Site Menu* (), expand *People*, and select *Memberships*.
3. Click *New*.
4. Select *Christian Carter* and *Harper Roberts*.

5. Click *Done*.

Great! Now both users are members of the site and you can assign site roles to them.

User	Profile Picture	First Name	Last Name	Username
Clarity Admin		Clarity Admin		clarityadmin
Christian Carter		Christian	Carter	christiancarter
Walter Douglas		Walter	Douglas	walterdouglas
Ian Miller		Ian	Miller	ianmiller
Clara Murphy		Clara	Murphy	claramurphy
Harper Roberts		Harper	Roberts	harperroberts

6. Click *Actions* (⋮) for Christian Carter and select *Assign Roles*.

7. Select the *Site Content Contributor* role and click *Done*.

This enables Christian Carter to make contributions to the Clarity's website content.

8. Repeat steps 6-7 to assign the Site Content Contributor role to Harper Roberts as well.

Next, you'll begin configuring Clarity's enterprise website to ensure it is public and accessible to their target audience.

Exercise 4c: Configuring the Site

As mentioned previously, the purpose of Clarity's site is to increase brand awareness, showcase their products, and convert visitors to customers. To this end, Clarity wants to

- Allow guest users to freely register as site members.
- Set their site's virtual host.
- Configure their language settings.
- Enable Liferay's OOTB accessibility tools.

Here you'll configure these settings as Clarity's IT Manager, Ian Miller.

To do this,

1. Ensure you're in the *Clarity Public Enterprise Website*.

2. Open the *Site Menu* (☰), expand *Configuration*, and select *Site Settings*.

The screenshot shows the Site Settings page in a Liferay application. On the left, there is a sidebar with various menu items: Home, Page Tree, Design, Site Builder, Content & Data, Categorization, Recycle Bin, People, Configuration, Site Settings, Redirection, Workflow, and Publishing. The 'Configuration' item has a dropdown arrow indicating it has sub-items. The 'Site Settings' item is highlighted with a yellow border. In the main content area, there is a search bar at the top. Below it, there are two sections: 'COMMERCE' and 'PLATFORM'. The 'COMMERCE' section contains icons for Catalog, Orders, Payment, and Shipping. The 'PLATFORM' section contains icons for Accessibility, Accounts, Analytics, Cookies, Infrastructure, Localization, Maps, Site Configuration, Third Party, and Users.

3. Go to *Site Configuration* → *Details*.

4. Add this description:

Elevate Your Brand with Premium Eyewear: Discover premium craftsmanship, innovative lenses, and designs that help your brand stand out.

5. For Membership Type, select *Open*.

This allows guests to freely become site members and access the site's public pages and content.

SITE SCOPE

Details

Site Settings > Site Configuration

Details

Site ID: 32106

Name *: Clarity Public Enterprise Website (en-US)

Description: Elevate Your Brand with Premium Eyewear: Discover premium craftsmanship, innovative lenses, and designs that help your brand stand out. (en-US)

135/4000

Active (checked)

Parent Site: (empty input field) [Clear] [Change]

Membership Type: Open

Allow Manual Membership Management (checked)

Save [Cancel]

6. Click **Save**.

7. Go to the *Site URL* tab.

8. Set the friendly URL to [/clarity](#).

This URL is used by site pages and is appended to <http://localhost:8080/web>.

9. Set the site's virtual host for the default language to [www.clarityvisionsolutions.com](#).

Setting the virtual host connects a domain name (e.g., [www.helloworld.com](#)) to a site.

Note: Before setting the virtual host in Liferay, you must contact your provider and set the DNS name to point to the IP address for your Liferay DXP instance.

10. Click **Add** (+) to add an extra virtual host for Spanish with the URL [www.solucionesdeclaridad.com](#).

This way their Spanish speaking audience can access the site using a localized domain name.

The screenshot shows the 'Site URL' configuration page under 'Site Settings > Site Configuration'. The 'Site URL' tab is selected. A yellow box highlights the 'Friendly URL' input field containing '/clarity'. Another yellow box highlights the 'PAGES' section, which contains two entries: 'Virtual Host' (www.clarityvisionsolutions.com) mapped to 'Language' (Default Language) and 'Virtual Host' (www.solucionesdeclaridad.com) mapped to 'Language' (Spanish (Spain)). Both sections have a '+' button to add more mappings. At the bottom are 'Save' and 'Cancel' buttons.

11. Click **Save**.

12. Return to the *Site Settings* page and go to *Localization*.

13. Click *Define a custom default language* and use the *left arrow* button (◀) to remove all languages except for English and Spanish.

For now, Clarity only wants to support English (United States) and Spanish (Spain) for content localization on their site.

Tip: To select multiple languages at a time, hold the CTRL key.

Use the default language options.
 Define a custom default language and additional available languages for this site.

Default Language

English (United States)

AVAILABLE LANGUAGES

Available	Current
Arabic (Saudi Arabia)	English (United States)
Chinese (China)	Spanish (Spain)
Dutch (Netherlands)	
Catalan (Spain)	
French (France)	
German (Germany)	

Save **Cancel**

14. Click **Save**.

15. Return to the *Site Settings* page and go to *Accessibility*.

16. Check the box to enable the accessibility menu.

This means users can press Tab twice and hit Enter to access a menu for configuring their accessibility settings.

Enable Accessibility Menu

Enable the accessibility menu which can be accessed by tabbing focus to the quick access menu. When enabled, users are able to save their accessibility settings in the browser local storage when not signed in and in the database when signed in.

Update **Cancel**

17. Click **Save**.

Together, these configurations help Clarity's enterprise website fulfill its intended purpose: promoting their products to their international audience. Liferay provides many other site configurations, including cookie handling, session timeouts, and SEO. For now, these configurations satisfy Clarity's basic needs.

Before moving further, let's update the default home page and landing page for Clarity's instance.

Configuring the Instance's Default Home and Landing Pages

Currently, when you visit <http://localhost:8080/>, you're directed to the default Clarity Vision Solutions site, instead of Clarity Public Enterprise Website. Here you'll update the default home and landing pages for your instance as the Clarity Admin user.

To do this,

1. Sign in as the Clarity Admin user:

- Username: admin@clarityvisionsolutions.com
- Password: [learn](#)

2. Open the *Global Menu* (), go to the *Control Panel* tab, and click *Instance Settings*.

3. Under Platform, click *Instance Configuration* and go to the *General* tab.

4. For Home URL, enter </web/clarity>.

This sets the default page displayed when you access <http://localhost:8080/>.

5. For Default Landing Page, enter </web/clarity>.

This specifies the default page to which users are redirected after logging in.

6. For Default Logout Page, enter </web/clarity>.

This defines the default page to which users are redirected after signing out.

The screenshot shows the 'Instance Settings' interface with the 'General' tab selected. In the 'Navigation' section, the 'Home URL' is set to '/web/clarity', the 'Default Logout Page' is set to '/web/clarity', and the 'Default Landing Page' is also set to '/web/clarity'. A yellow box highlights this section.

7. Click *Save*.

Great! Now when users visit <http://localhost:8080/> and log out or log in, they're directed to the home page for Clarity's public enterprise website.

Next, you'll learn about how Analytics Cloud can help businesses like Clarity enhance their digital strategy and support data-driven workflows.

Exercise 5: Analytics Cloud

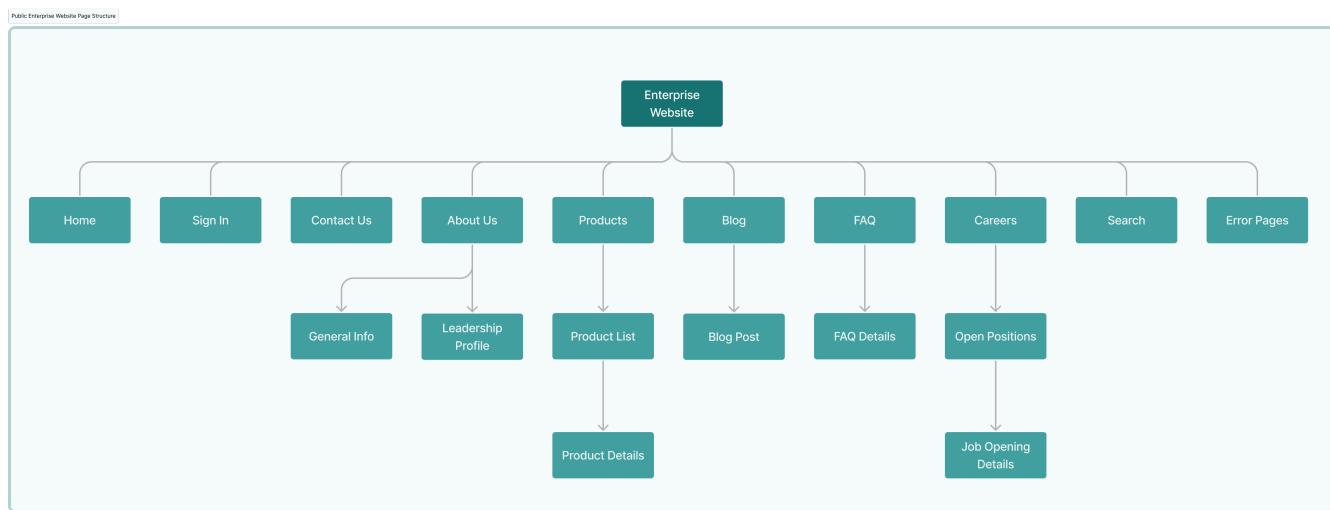
Liferay Analytics Cloud is a cloud-based analytics service that integrates with Liferay DXP to gain insights into user behavior for optimizing digital experiences. With it, businesses like Clarity can enhance their digital strategy and support data-driven workflows.

This training does not include exercises for Analytics Cloud.

Next, you'll finish implementing Clarity's enterprise website structure.

Exercise 6a: Adding Content Pages

As previously mentioned, Clarity wants to implement this page hierarchy for their enterprise website:



Some parts of this structure should be implemented as content pages, while others should be display pages or utility pages. The training workspace includes most of these pages, though it is missing the *FAQ* content page and the *Leadership Profile* display page.

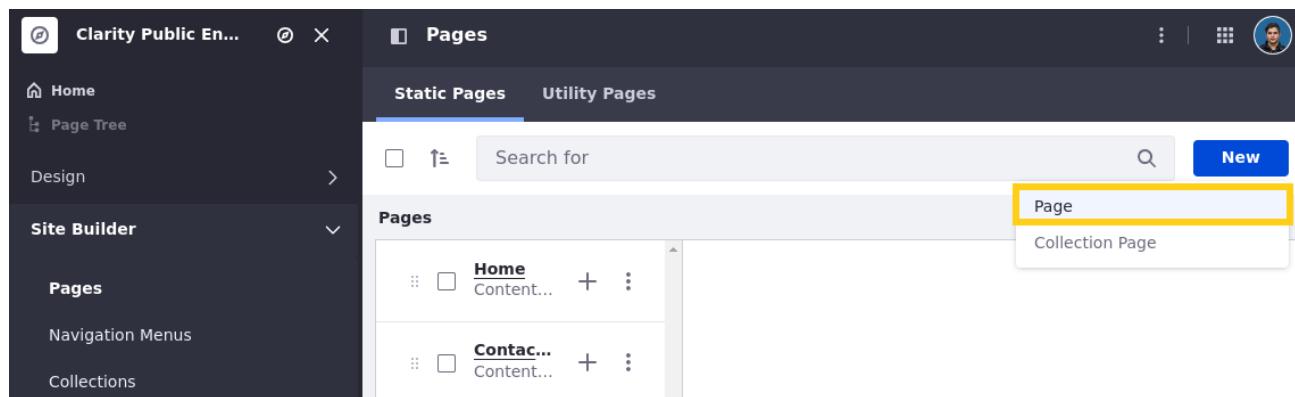
Here you'll add the missing content page as Clarity's web developer, Walter Douglas.

To add the FAQ content page,

1. Sign in as Walter Douglas.
 - Email: walter.douglas@clarityvisionsolutions.com
 - Password: [learn](#)

Note: As a web developer, Walter Douglas has the site administrator role and perform most actions within the enterprise website.

2. Open the *Site Menu* (grid icon), expand *Site Builder*, and click *Pages*.
3. In the Static Pages tab, click *New* and select *Page*.



4. Select the *Primary Master Page* template.

Note: This applies an incomplete template provided by the training workspace. You'll complete this template in later exercises.

5. For name, enter **FAQ** and click *Add*.

This creates a blank content page and directs you to Liferay's page editor UI. Here you can access all page building tools and configuration options.

6. For now, leave the page blank and click *Publish*.

This is the final content page that Clarity needs for their site structure. But they need to reorganize some pages to create the desired hierarchy.

7. Drag and drop *Product Detail* onto *Product List* and then drag and drop *Product List* onto *Products*.

This creates a hierarchical relationship between these pages.

The screenshot shows the Liferay Site Structure interface. On the left, there's a tree view of pages under 'Products'. The 'Product List' and 'Product Detail' pages are highlighted with yellow boxes. The 'Products' page at the bottom is also highlighted with a yellow box.

8. Drag and drop *Open Positions* onto *Careers*.

With these pages in place, let's create the final part of Clarity's site structure: a display page for their leadership profiles.

Exercise 6b: Adding Display Page Templates

Display page templates define structures for displaying content at a dedicated URL. When you create or upload content items, Liferay generates a unique friendly URL for accessing it. However, you can only use this URL to view the content if you create one of these templates for displaying it. Display pages are built using the same UI and features as content pages.

The training workspace includes all necessary display pages except for the *Leadership Profile* template. Here you'll add this missing template as Walter Douglas.

To do this,

1. Open the *Site Menu* (grid icon), expand *Design*, and click *Page Templates*.
2. Go to the *Display Page Templates* tab.
3. Click *New*.
4. Select *Blank*.
5. For Name, enter **Leadership Profile**.
6. For Content Type, select *Web Content Article*.
7. For Subtype, select *Leadership Profile*.

Note: The Leadership Profile subtype was provided by the training workspace. You'll learn more about web content types in a later lesson.

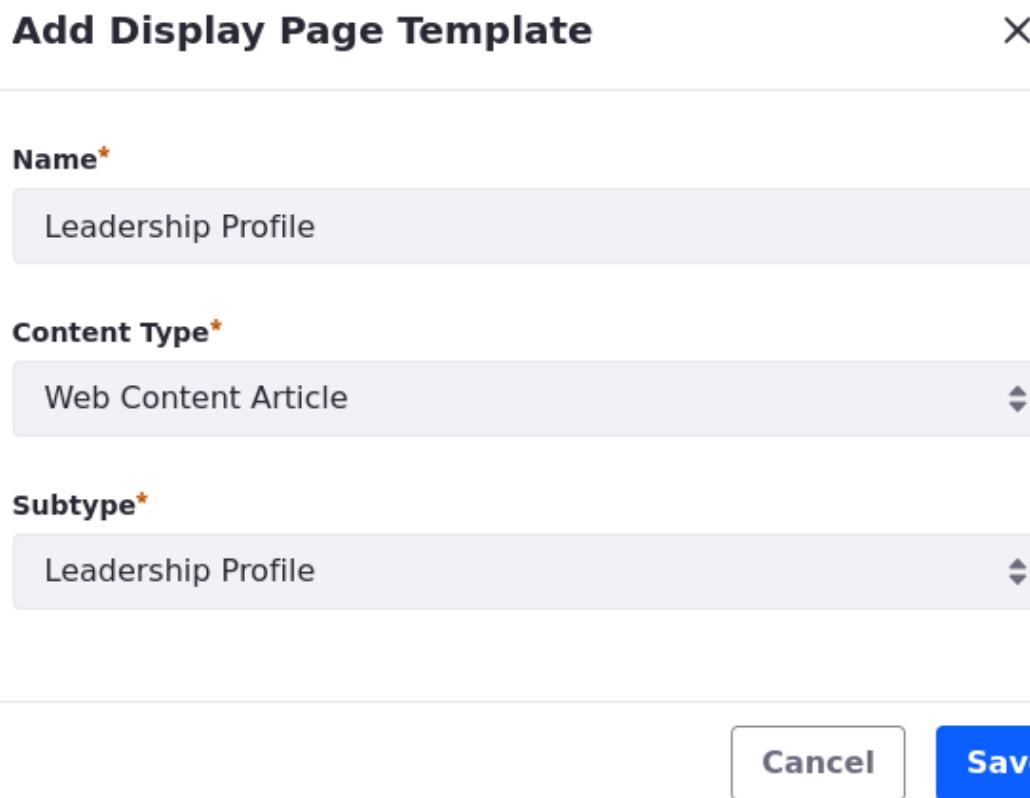
Add Display Page Template

Name*
Leadership Profile

Content Type*
Web Content Article

Subtype*
Leadership Profile

Cancel **Save**



8. Click *Save*.

This creates a blank display page template that's linked to the selected content type. Each template has the same page building tools and configuration options as content pages.

9. For now, leave the template blank and click *Publish*.

10. Click *Actions* (⋮) for the Leadership Profile template and select *Mark as Default*.

This ensures leadership profile articles use this template.

The screenshot shows the 'Page Templates' application in Liferay. The top navigation bar includes tabs for 'Masters', 'Page Templates', and 'Display Page Templates'. Below the navigation is a search bar and a 'New' button. The main area, titled 'DISPLAY PAGES', contains a grid of eight page templates. Each template card includes a checkbox, a file icon, a blue circular status indicator, and a title with a brief description and an 'APPROVED' button. The 'Leadership Profile' template is highlighted with a yellow border.

Template	Description	Status
Blog Post	Blogs Entry	APPROVED
General Info	Web Content Article - Basic	APPROVED
FAQ Detail	Web Content Article - FAQ	APPROVED
Job Opening Detail	Web Content Article - Job L...	APPROVED
Legal	Web Content Article - Legal	APPROVED
Article	Web Content Article - Article	APPROVED
Leadership Profile	Web Content Article - Lead...	APPROVED

For now, we'll leave this template blank, but we'll revisit it in a later exercise. With Clarity's page structure complete, let's finish designing the header for Clarity's pages.

Exercise 6c: Designing Clarity's Master Pages

In Liferay, designing page headers and footers involves creating master page templates. These templates are designed using the same tools and elements as pages.

The training workspace provides the *Primary Master Page* template. While this template includes the footer, it does not include a header. Here you'll add the header as Walter Douglas.

To do this,

1. While in the Page Templates application, go to the *Masters* tab.
2. Click the *Primary Master Page* template to begin editing it.
3. Open the *Fragments and Widgets* tab (+) in the left side panel.
4. Drag and drop a *Container* fragment to the top of the template. This container is for the page header.

Note: When designing a page, it's recommended to always put elements into their own containers. This can help provide more control over styling.

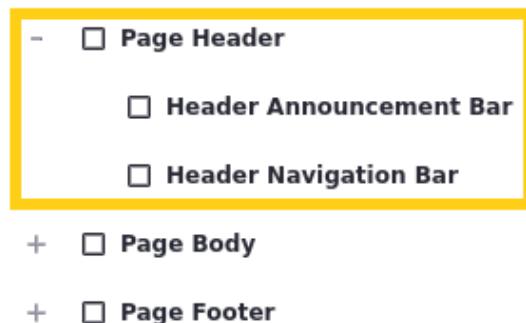
5. Go to the *Browser* tab in the side panel (≡), double-click the name of the container and rename it **Page Header**.

Note: Naming fragments adds a custom `data-name` attribute to the `<div>` that you can use in your JavaScript and CSS. This can help bring clarity to complex page structures and provide more control over your site.

6. Add two separate containers to the Page Header container and name them **Header Announcement Bar** and **Header Navigation Bar**.

- **Header Announcement Bar:** This container is for displaying Clarity's announcements.
- **Header Navigation Bar:** This container is for essential elements, including Clarity's logo, main navigation menu, search bar, and user menu.

Tip: To duplicate a page element while editing, press CTRL + D.



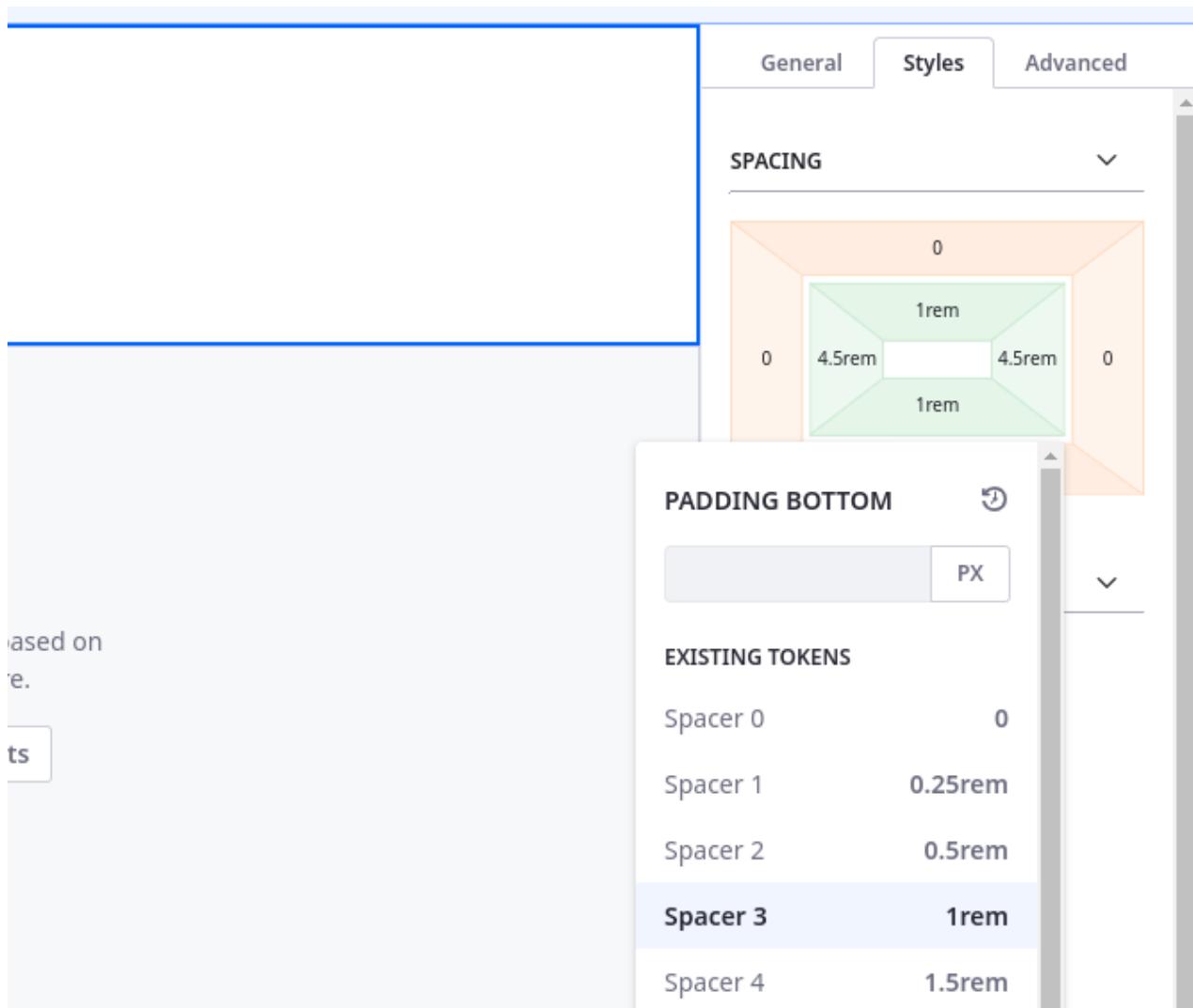
Note: Use the green boxes to add padding. This adds space between the container and its contents.

You'll see these settings take effect when you add page elements to the container.

For now, leave this container empty and toggle its visibility (); you'll revisit it in a later exercise.

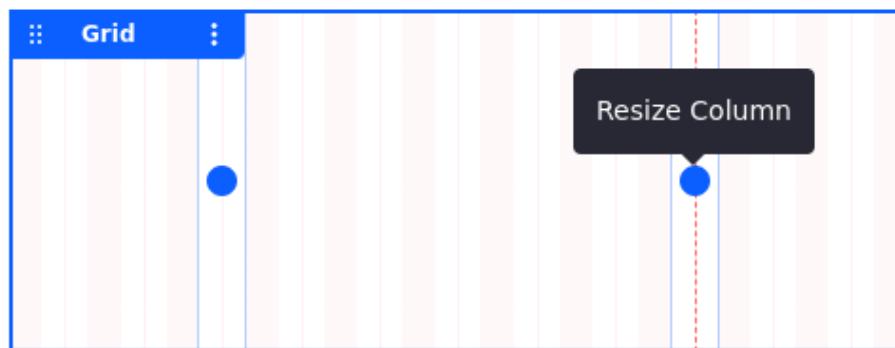
8. Select the *Header Navigation Bar* container and configure these settings:

Tab	Setting	Value
General	Container Width	Fixed Width
Styles	Spacing > Padding	Spacer 3 (top and bottom) Spacer 6 (left and right)



9. Add a *Grid* element to the Header Navigation Bar container.

10. Widen the center module by dragging the dividers outward one space on each side.



11. Select the grid and configure these settings:

Tab	Setting	Value
General	Vertical Alignment	Middle
General	Overflow	Visible

12. Add a container to each grid area and name them Header Branding, Header Navigation, and Header User Actions.

- **Header Branding:** This container is for Clarity's logo.
- **Header Navigation:** This container is for the page navigation menu.
- **Header User Actions:** This container is for the search bar and user login/menu.

The screenshot shows the Liferay Page Editor interface. On the left is a tree view of the page structure:

- Page Header
 - Header Announcement Bar
 - Header Navigation Bar
 - Grid (highlighted with a yellow box)
 - Module
 - Header Branding (selected, highlighted with a blue box)
 - Module
 - Header Navigation
 - Module
 - Header User Actions
- Page Body
- Drop Zone
- Page Footer

The right side of the screen is a large empty content area with a blue border, representing the placeholder for the selected 'Header Branding' module.

13. Select the *Header Branding* container and configure these settings:

Tab	Setting	Value
General	Content Display	Flex Row
General	Align Items	Center
General	Justify Content	Start

14. Select the *Header Navigation* container and configure these settings:

Tab	Setting	Value
General	Content Display	Flex Row
General	Align Items	Center
General	Justify Content	Center

15. Select the *Header User Actions* container and configure these settings:

Tab	Setting	Value
General	Content Display	Flex Row
General	Align Items	Center
General	Justify Content	End

16. Add these fragments to the containers:

Container	Fragment
Header Branding	Image
Header Navigation	Menu Display
Header User Actions	Login and User Menu

Note: The "Login and User Menu" fragment is a custom fragment provided in the Clarity Components fragment set. In a later lesson, you'll create a custom fragment for the header's search button.

For now, this completes the wireframing for the primary master page. You'll revisit it again in the following lessons to update its menus and add the search bar. Next, you'll configure the template's allowed fragments.

Exercise 6d: Configuring Allowed Fragments

When editing a master page template, you can configure which fragments are allowed in pages that use the template. This helps ensure consistent design and prevents users from adding incorrect elements to pages that

use the template.

To ensure users only add the appropriate fragments to pages with the Primary Master Page template, Clarity wants to limit the available fragments. Here you'll configure the allowed fragments for the Primary Master Page template as Walter Douglas.

To do this,

1. While editing the Primary Master Page template, click *Configure Allowed Fragments* in the Page Body container.
2. Uncheck these fragments to prevent users from adding them to pages using the template:
 - Account (fragment set)
 - Cart (fragment set)
 - Footers (fragment set)
 - Navigation Bars (fragment set)
 - Knowledge Base Navigation (fragment)
 - Add to Cart (fragment)

Allowed Fragments X

Specify which fragments a page author is allowed to use within the drop zone when creating a page from this master.

- All Fragments
 - Basic Components
 - Content Display
 - Account
 - Cart
 - Cookie Banner
 - Featured Content
 - Footers
 - Navigation Bars
- Menu Display
 - Knowledge Base Navigation
 - Menu Display
- Product
 - Image Gallery
 - Add to Cart
 - Product Card

Select New Fragments Automatically

CancelSave

3. Click *Save*.
4. Click *Publish Master*.
5. Click *Ok* in the popup stating:

Changes made to this master are going to be propagated to all page templates, display page templates, and pages using it. Are you sure you want to proceed?

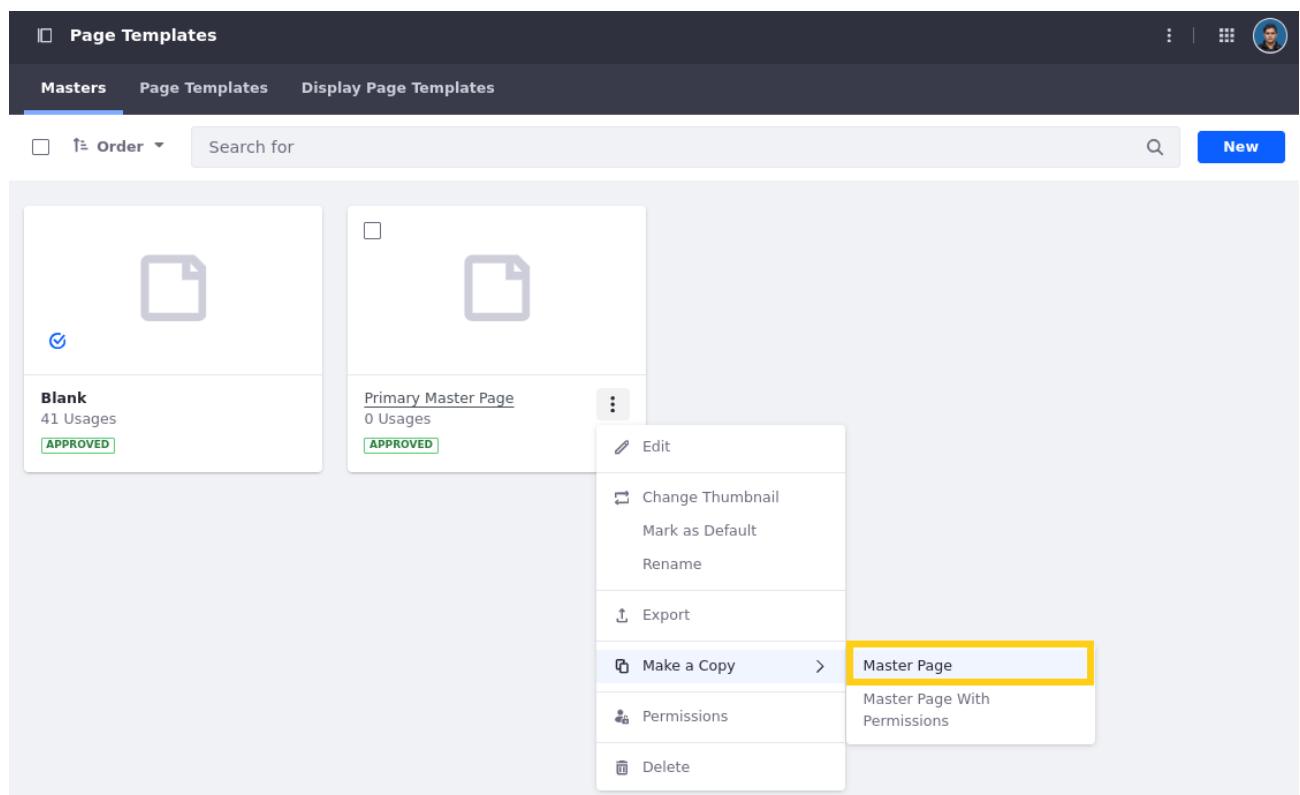
Now when the template is applied to a page, users can only add the allowed fragments to the page. But before we apply the template to any pages, let's create the secondary master page that Clarity wants to use for their sign in and utility pages.

Exercise 6e: Creating a Secondary Master Page

Clarity needs a simplified master page for pages that shouldn't include the announcement banner and detailed footer. Here you'll create that template as Walter Douglas.

To do this,

1. While in the Masters tab of the Page Templates application, click *Actions* (⋮) for the Primary Master Page and select *Make a Copy* → *Master Page*.



2. Click *Actions* (⋮) for the copy and select *Rename*.
3. Enter **Secondary Master Page** and click *Save*.
4. Begin editing the template and remove these containers:

- Header Announcement Bar
- Footer Branding
- Footer Navigation

5. Click *Publish Master*.

Great! Clarity now has both a primary and secondary master page template. You can now apply both master pages to their respective pages.

Exercise 6f: Applying the Master Pages

When you create a content page or display page template, you must select a master page. While most pages in your training workspace already use the correct master page, several pages do not.

Here you'll configure these pages assigning them the correct master page as Walter Douglas.

To do this,

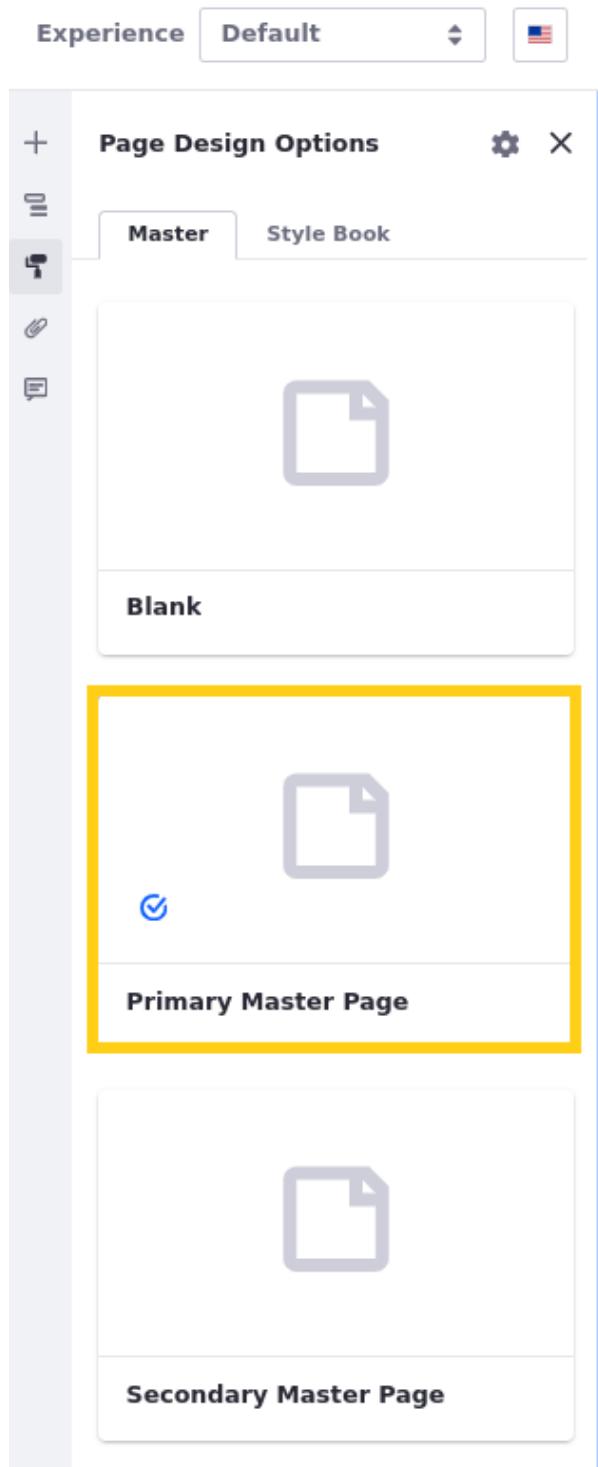
1. Begin editing one of these pages.
 - Home (Content Page)
 - Sign In (Content Page)
 - Leadership Profile (Display Page Template)

To access the display page template, open the *Site Menu* (grid icon), expand *Design*, click *Page Templates* and go to the *Display Page Templates* tab.

2. Go to the *Page Design Options* tab (gear icon) in the left side panel.

3. Select the appropriate *master page*.

- **Home:** Primary Master Page
- **Sign In:** Secondary Master Page
- **Leadership Profile:** Secondary Master Page



4. Click *Publish*.

5. Repeat this process until you've finished applying the master pages.

Once finished, each page should be linked to the correct master page template. Now any changes made to the templates are automatically applied to each page using it.

Next, you'll create custom navigation menus and use them for these master page templates so they only include the desired pages.

Exercise 7a: Creating Navigation Menus

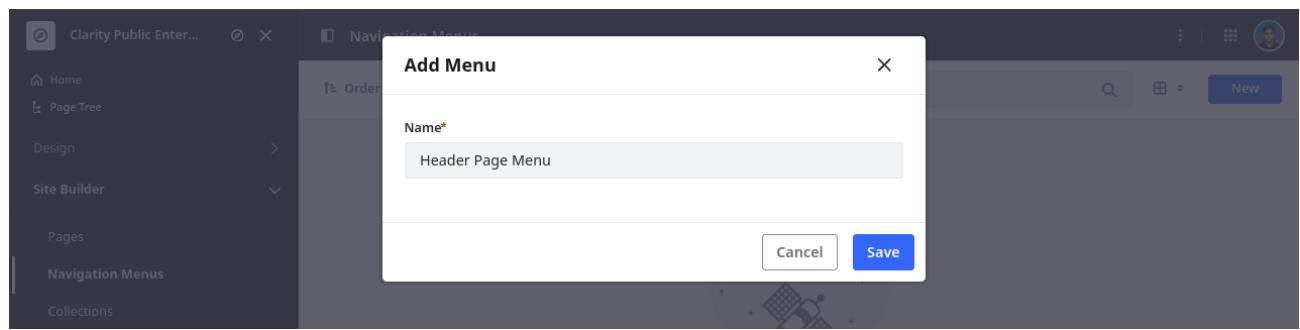
Navigation is an integral part of designing a clear and intuitive user experience. In Liferay, setting up navigation involves creating menus and then adding them to pages using widgets or fragments.

Most of the custom navigation menus that Clarity needs are provided in the training workspace. However, they still need a menu for their page header that only includes these pages: Products, About Us, Blog, FAQ, Careers, and Contact Us.

Here you'll create this custom navigation menu as Walter Douglas.

To do this,

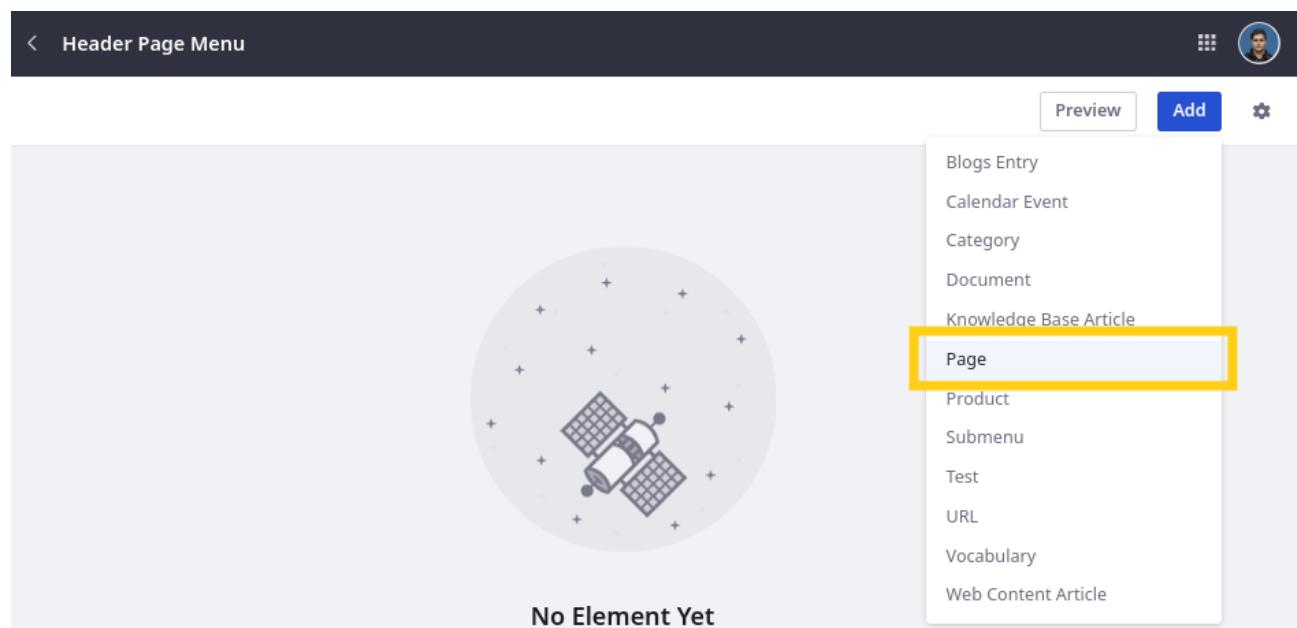
1. Open the *Site Menu* (grid icon), expand *Site Builder*, and click *Navigation Menus*.
2. Click *New*.
3. For Name, enter **Header Page Menu**.



4. Click *Save*.

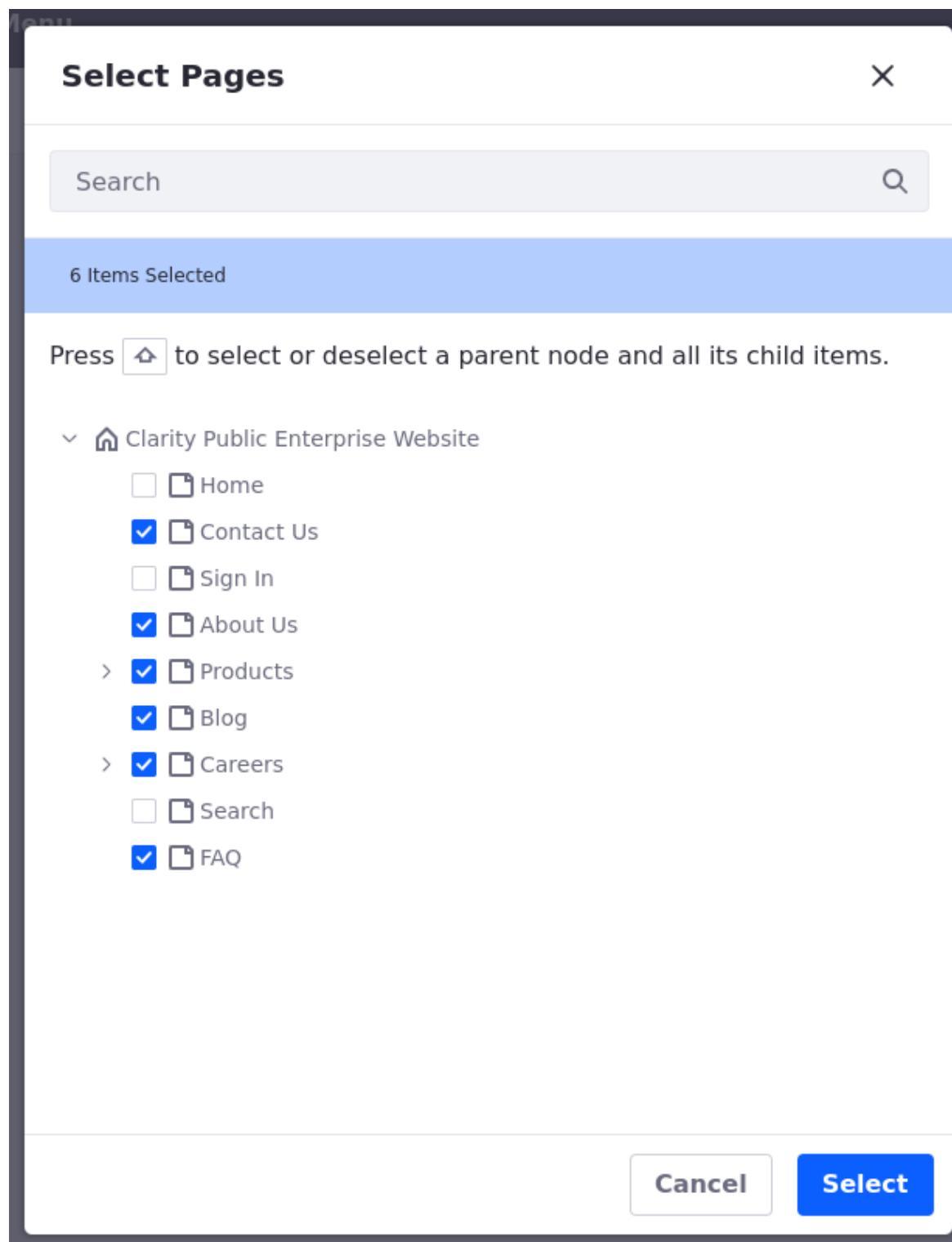
This creates a blank menu and directs you to its edit page. Now you can add pages to it.

5. Click *Add*. This displays a list of available types of items you can add to the menu.
6. Select the *Page* item type.



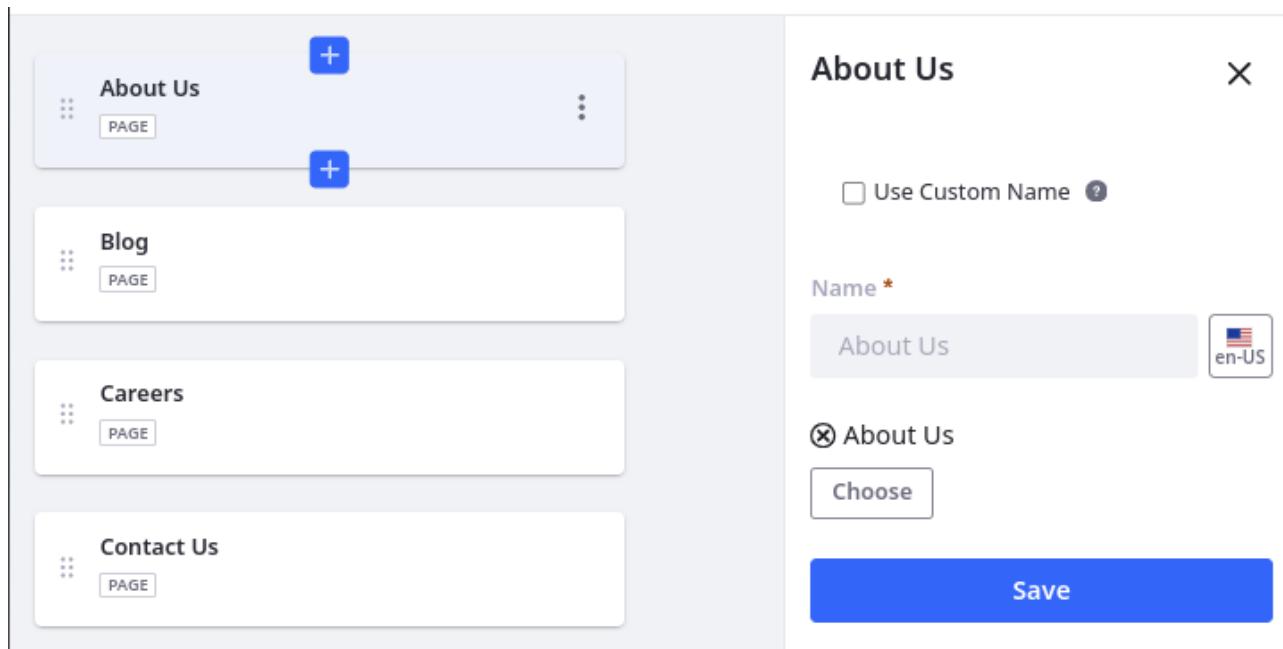
7. Check these pages:

- About Us
- Blog
- Careers
- Contact Us
- FAQ
- Products



8. Click *Select*. This saves your changes to the menu.

9. Click *Actions* () for one of the menu items and select *View Info*. This opens a side panel where you can update its display name if desired.



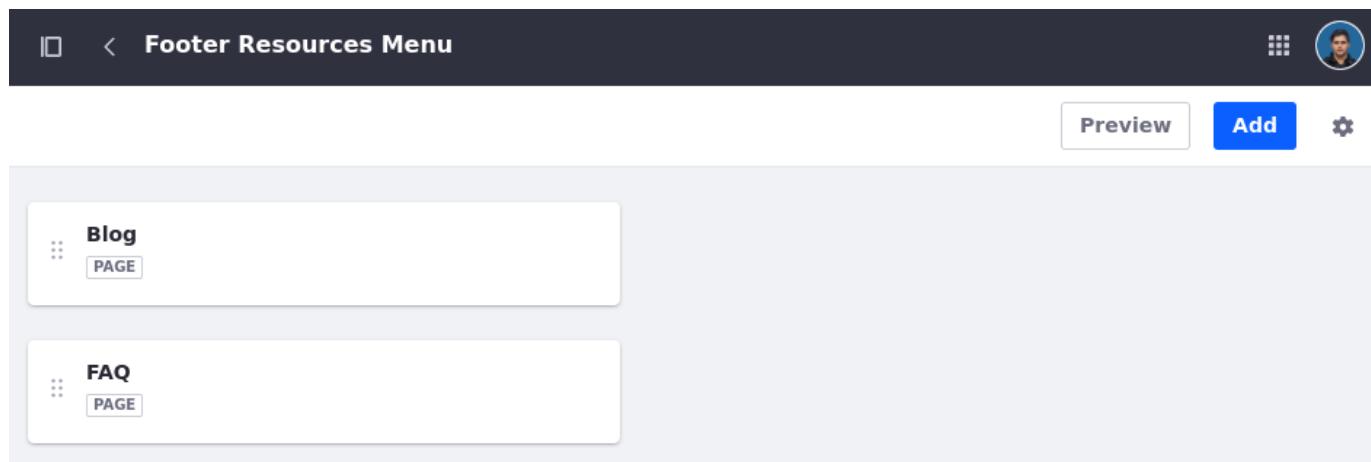
10. Drag and drop the pages into this order:

- Products
- About Us
- Blog
- FAQ
- Careers
- Contact Us

These changes are saved automatically, so the menu is ready to use.

Now that the header page menu is defined, you can update the menu display fragment in each master page's header to use it. But before returning to Clarity's master pages, let's update their Footer Resource Menu to include the recently created FAQ page.

1. Return to the *Navigation Menus* overview page.
2. Select *Footer Resources Menu*.
3. Click *Add*.
4. Select the *Page* item type.
5. Check *FAQ*.
6. Click *Select*.



The screenshot shows the 'Footer Resources Menu' configuration screen. It displays two menu items: 'Blog' and 'FAQ'. Each item has a small icon and a 'PAGE' button below it. At the top right, there are buttons for 'Preview', 'Add', and settings. The 'Add' button is highlighted in blue.

With Clarity's navigation menus complete, let's return to Clarity's master page templates and update their header menu displays to use the correct navigation menu.

Exercise 7b: Updating Menu Display Fragments

When you add a menu display fragment or widget to a page, you can determine which menu to display. Here you'll update the header menu display fragment in Clarity's master pages as Walter Douglas.

To do this,

1. Begin editing the *Primary Master Page* template.
2. Select the *menu display* fragment in the header.
3. In the configuration side panel, click *Change Source* (↗) for the menu's source.
4. Click *Header Page Menu* and click *Select This Level*.



The screenshot shows the Liferay DXP configuration interface. It displays a header with a 'Menu Display' fragment containing 'FAQ', 'Careers', and 'Contact Us' links. To the right is a configuration sidebar with sections for 'Gene...', 'Sty...', and 'Advan...'. Under 'MENU DISPLAY OPTIONS', the 'Source' section is highlighted with a yellow box, showing 'Header Page Menu' selected. Below it, the 'Display Style' is set to 'Horizontal'.

5. Click *Publish Master*.
6. Repeat this process to update the Secondary Master Page's menu display fragments.

Once finished, navigate to the Home page to see how your changes to the template were automatically applied to the connected pages.

The screenshot shows the homepage of the Clarity Bootcamp website. At the top, there's a dark header bar with a 'Home' button and several icons. Below the header is a light blue navigation bar with links for 'Products', 'About Us', 'Blog', 'FAQ', 'Careers', and 'Contact Us'. To the right of the navigation bar is a circular profile picture of a person. The main content area features a large, bold heading 'Welcome to the Clarity Bootcamp!' above a decorative graphic of stylized blue leaves and a white curved shape. A small 'Edit' icon is located near the bottom left of the main content area.

Clarity's master pages are nearly done. Now they just need a custom Search Button fragment to add to the header.

Exercise 8a: Creating Custom Fragments

Page fragments are reusable drag-and-drop elements for designing page layouts, displaying content, building forms, and more. They are built using HTML, CSS, and JavaScript and can provide both structure and functionality to pages. Liferay provides a variety of fragments out-of-the-box, but you can develop your own.

The training workspace includes a set of custom fragments called Clarity components. While this fragment includes most of what Clarity needs, they still need a custom Search Button fragment. Here you'll create it as Walter Douglas.

To do this,

1. Open the *Site Menu* (grid icon), expand *Design*, and click *Fragments*.
2. Under Fragment Sets, click *Clarity Components*.
3. Click *New*, select *Basic Fragment*, and click *Next*.
4. Enter *Search Button* and click *Add*.
5. Go to the *Configuration* tab and copy the contents of the `search-button-configuration.json` file into the editor. This file is in the `[repository-folder]/exercises/lesson-8/` folder.

JSON

Add the JSON configuration:

```

1+ {
2+   "fieldSets": [
3+     {
4+       "fields": [
5+         {
6+           "dataType": "string",
7+           "defaultValue": "search",
8+           "label": "icon-name",
9+           "name": "iconName",
10+          "type": "text"
11+        },
12+        {
13+          "dataType": "string",
14+          "defaultValue": "1rem",
15+          "label": "icon-size",
16+          "name": "iconSize",
17+          "type": "select",
18+          "typeOptions": [
19+            {
20+              "validValues": [
21+                {
22+                  "value": "1rem"
23+                },
24+                {
25+                  "value": "1.5rem"
26+                },
27+                {
28+                  "value": "2rem"
29+                },
30+                {
31+                  "value": "2.5rem"
32+                },
33+                {
34+                  "value": "3rem"
35+                }
36+              ]
37+            }
38+          ]
39+        }
40+      ]
41+ }

```

This defines two configuration options for the fragment: `iconName` and `iconSize`. You can reference these options in the fragment's code.

6. Return to the *Code* tab and replace the contents of the *HTML* window with the contents of the `search-button.ftl` file. This file is also in the `[repository-folder]/exercises/lesson-8/` folder.

HTML

```

1+ <div class="component-button text-break">
2+   <a
3+     class="btn"
4+     data-lfr-editable-id="link"
5+     data-lfr-editable-type="link"
6+     href="#"
7+     id="fragment-${fragmentEntryLinkNamespace}-link"
8+   >
9+     <span style="font-size: ${configuration.iconSize}">
10+       [@clay["icon"] symbol="${configuration.iconName}"]
11+     </span>
12+   </a>
13+ </div>

```

Notice this includes references to the configuration options you defined in the previous step: `${configuration.iconSize}` and `${configuration.iconName}`. This way you can configure the icon's name and size when you add the fragment to a page.

7. Click *Publish*.

You can now add this fragment to Clarity's master pages. But before you do this, let's import some additional fragments that you'll use throughout the following exercises.

Exercise 8b: Importing Fragments

When building pages with fragments, you can save any container and its contents as a composition for reuse. Clarity's team has provided some fragments to wireframe the Home page, FAQ page, and Leadership Profile display page. To use these fragments, you must first import them to your site as Walter Douglas.

While in the Fragments application,

1. Under Fragment Sets, click *Clarity Page Compositions*.
2. Click *Actions* (⋮) for the fragment set and select *Import*.

The screenshot shows the Liferay Fragments application interface. On the left, there is a sidebar titled 'FRAGMENT SETS' with a list of available sets. The 'Clarity Page Compositions' set is selected and highlighted with a blue background. In the main area, there is a grid of compositions. Each composition has a preview icon, a title, a modified date, and a status indicator (e.g., APPROVED). At the top right of the main area, there is a toolbar with several actions: 'Edit', 'Export', 'Import' (which is highlighted with a yellow box), 'Search for', 'Delete', and 'New'. Below the toolbar, there is a search bar labeled 'Search for' and a 'Order' dropdown.

3. Click *Select File*, navigate to the [repository-folder]/exercises/lesson-8/ folder in the training workspace, and select *page-composition-faq.zip* file.

4. Click *Import*.

5. Click *Done* when finished.

This adds the FAQ Page composition to the current fragment set. You can now import the display page composition.

6. Repeat the above steps to import these compositions:

Fragment Set	File
Clarity Page Compositions	page-composition-faq.zip
Clarity Display Compositions	display-composition-leadership-profile.zip

Great! Now that you've created and imported Clarity's custom fragments, you can add them to pages.

Exercise 8c: Adding Custom Fragments to Master Pages

After creating the Search Button fragment, you'll add it to the primary and secondary master pages as Walter Douglas.

To do this,

1. Open the *Page Templates* application and begin editing *Primary Master Page*.
2. Add the *Search Button* fragment to the Header User Actions container.



3. In the Browser side panel (≡), select the *link* sub-element for the Search Button fragment.
4. In the configuration side panel, go to the *Link* tab and configure these settings:

Tab	Setting	Value
Link	Link	Page
Link	Page	Search

Now when users click the button, they're directed to Clarity's Search page.

5. Click *Publish Master*.
6. Click *Ok* in the popup.
7. Repeat these steps to update *Secondary Master Page*.

Great! Next, let's add the imported fragment compositions to Clarity's pages.

Exercise 8d: Adding Fragment Compositions to Pages

Fragment compositions are reusable arrangements of page elements saved within a fragment container. You can use them to quickly duplicate layouts between site pages to accelerate development and achieve a more consistent design.

Here you'll add the fragment compositions to their corresponding pages as Walter Douglas.

To do this,

1. Begin editing one of these pages or display page:
 - Home (Content Page)

- FAQ (Content Page)
- Leadership Profile (Display Page Template)

2. Drag and drop the corresponding fragment composition into the page's central content area.

Note: For the Home page, remove its default content before adding the fragment composition.

The screenshot shows the Liferay Site Builder interface for editing the 'FAQ' page. The left sidebar lists 'CLARITY PAGE COMPOSITIONS' with options like 404 Error Page, 500 Error Page, About Us Page, Blog Page, Careers Page, Contact Us Page, FAQ Page, Home Page, Open Positions Page, Product Details Page, Product Lists Page, Products Page, Search Page, and Signin Page. The 'FAQ Page' is selected and highlighted with a yellow box and arrow. The main content area displays the page structure with sections for Products (Eyeglasses, Sunglasses, Contacts, Lenses), About Us (Leadership, Our Impact, Contacts), Resources (Blog, FAQ), and Get In Touch (Contact Us). A large dashed blue box indicates the area where fragments or widgets can be placed.

3. Click *Publish*.

4. Repeat this process until you've finished adding the page compositions to the other pages.

Congratulations! You've finished wireframing Clarity's pages. Next, you'll apply their branding to the site.

Exercise 8e: Updating Clarity's Default Theme, Favicon, and Logo

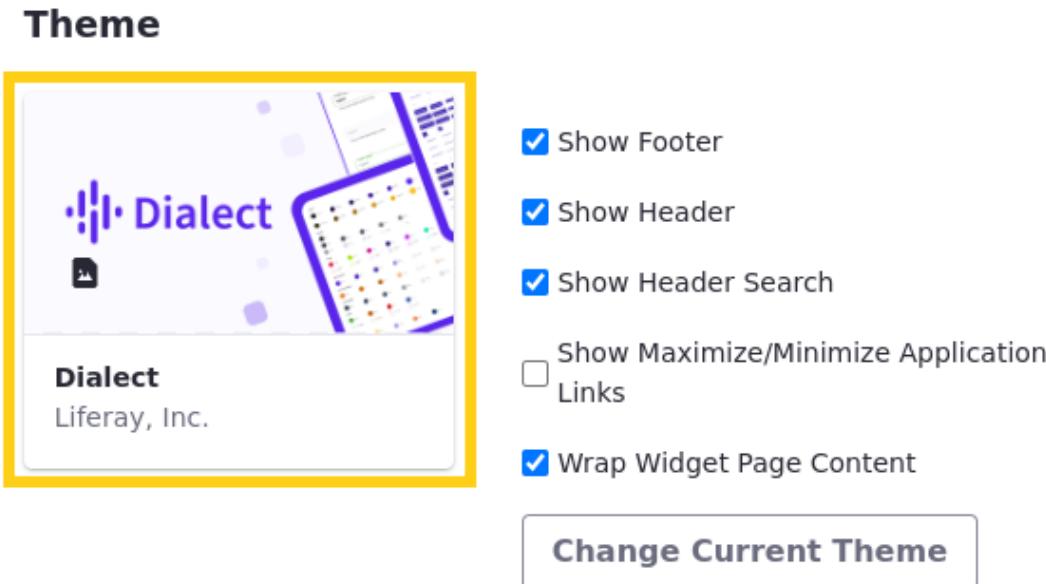
Liferay empowers users with a set of powerful styling tools for both technical and non-technical users, ensuring a consistent visual identity and user experience across your website. So far, we've used the classic theme's default styling options.

Here you'll use the Theme CSS client extension to overwrite these options as Walter Douglas. You'll also update the site's favicon and logo to make the platform align more closely with Clarity's branding.

To do this,

1. Open the *Site Menu* (), expand *Site Builder*, and click *Pages*.
2. Click *Actions* () in the Application Bar and select *Configuration*.

3. Click *Change Current Theme* and select *Dialect*.



Note: Themes determine the baseline look and feel for your website, including color schemes, typography, spacing, and other styling options. They serve as the starting point for additional configurations that you can make using style books and frontend client extensions.

4. Under Basic Settings, click *Select Favicon* (☞) and add the `clarity-favicon.svg` file found in the `[repository-folder]/exercises/lesson-8/` folder.

Note: Favicons are images used to identify sites in browser tabs.

5. Click *Change Logo* (☞) and select the `clarity-logo-c.png` file.

Note: The logo determines the image used to identify the site in the Liferay UI.

Basic Settings

FAVICON



Favicon

clarity-favicon.svg



LOGO

Upload a logo for pages that is used instead of the default enterprise logo.



Logo

clarity-logo-c.png



Show Site Name

6. Scroll down to the bottom and click *Save*.

You can now explore site pages to see how these configurations have affected the site. Next, you'll deploy a client extension to apply Clarity's styling on top of the Dialect theme.

Exercise 8f: Deploying and Applying Clarity's Theme CSS Client Extension

Liferay offers frontend client extensions to provide a flexible and secure way to customize the appearance of your website. With them, you can inject design assets directly into your site pages, empowering you to achieve the desired look and feel without modifying Liferay's core code.

The training workspace includes a theme CSS client extension for overriding the current theme's CSS files. Here you'll deploy it as Walter Douglas.

To deploy Clarity's theme CSS client extension:

1. Open a new terminal window and go to the `liferay-clarity-theme-css` folder in your local copy of the training workspace (i.e., `[repository-folder]/client-extensions/liferay-clarity-`

theme-css)

2. Run this command to build and deploy the client extension:

Blade:

```
blade gw clean deploy
```

Unix-based systems:

```
.../.../gradlew clean deploy
```

Windows:

```
...\\..\\gradlew.bat clean deploy
```

3. Verify the command executes successfully in your instance logs.

```
2024-05-09 16:17:41.233 INFO [fileinstall-directory-watcher]  
[BundleStartStopLogger:68] STARTED liferayclaritythemecss*7.4.13 [1449]
```

Now that you've deployed the client extension, you can apply it to your pages.

4. In Clarity's site, open the *Site Menu* (□), expand *Site Builder*, and click *Pages*.
5. Click *Actions* (☰) in the Application Bar and select *Configuration*.
6. Under Customization, click *Plus* (+) for Theme CSS and select *Liferay Clarity Theme CSS*.

The screenshot shows the 'Customization' section of the Liferay Clarity theme settings. At the top, there are tabs for 'CSS' and 'JavaScript'. Below them, a section titled 'THEME CSS CLIENT EXTENSION' is expanded. It contains a note about replacing default CSS and overriding design tokens. A yellow box highlights the 'Theme CSS' input field, which currently contains 'Liferay Clarity Theme CSS'. To the right of the input field are two small icons: a refresh symbol and a trash symbol. Below this section, another section titled 'CSS CLIENT EXTENSIONS' is collapsed.

7. Click *Save*.

This applies the theme to all of Clarity's pages.

Note: After applying the client extension, you may need to clear your browser cache for the pages to appear as intended.

You can now explore Clarity's site to see how applying the theme has updated the styling of page elements.

The screenshot shows a website layout. At the top, there's a dark header bar with a 'Home' button and several icons. Below the header, a large blue banner features the text 'Elevate Your Brand with Premium Eyewear'. Underneath, a smaller text block says 'Discover premium craftsmanship, innovative lenses, and designs that help your brand stand out.' A green button labeled 'Start Your Journey' is visible. To the right of the banner is a large, solid blue rectangular area. Below the banner, a teal-colored section contains the heading 'See Further with Clarity Vision Solutions' and a paragraph about exclusive offers. A 'Learn More' button is also present in this section.

Congratulations! You've finished setting up Clarity's site architecture and styling. Next, you'll begin adding content.

Exercise 9a: Creating Asset Libraries

Asset libraries are spaces for storing documents, media, and web content articles. You can connect each library to multiple sites, enabling you to share your resources across multiple contexts.

The training workspace already includes multiple libraries for Clarity's assets. Here, you'll create a library for branding assets as Walter Douglas.

To do this,

1. Open the *Global Menu* (grid icon), go to the *Applications* tab, and click *Asset Libraries*.
2. Click *New* and enter the name **Clarity Branding and Logo**.
3. Click *Save*. This creates a library and redirects you to its configuration page.

Now you can link the library to Clarity's site.

4. Go to the *Sites* tab in the sidebar menu.
5. Click *Add* and select *Clarity Public Enterprise Website*.

Clarity Branding and Logo

General

Sites

Languages

Sites

An asset library can be connected to multiple sites. Please add those sites here.

CONNECTED SITES			
Name	Searchable Content ⓘ	Structures and Types ⓘ	
Clarity Public Enterprise Website	Yes	No	⋮

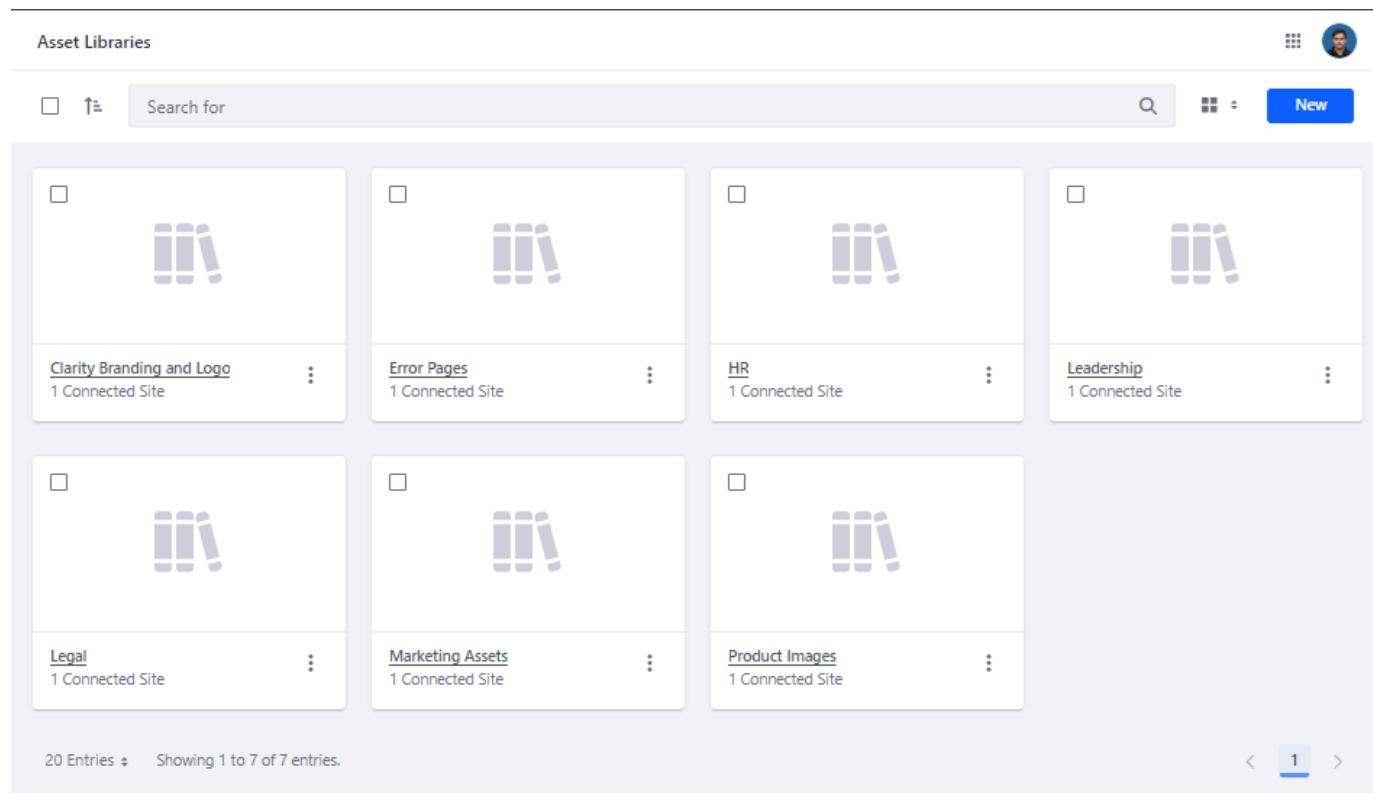
Add

This enables users in the site to access content in the asset library. Next, add content to the library.

6. Return to the *Asset Libraries* overview page.
7. Click *Clarity Branding and Logo* to access its applications and begin adding content.
8. Select *Documents and Media*.
9. Click *New* and select *Multiple Files Upload*.
10. Select all images from the [\[repository-folder\]/exercises/lesson-9/resources](#) folder.
11. Click *Publish*.

After completing this exercise, you should have seven asset libraries with images and content that you can use in Clarity's website:

- Clarity Branding and Logo
- Error Pages
- HR
- Leadership
- Legal
- Marketing Assets
- Product Images



The screenshot shows the 'Asset Libraries' interface in a web application. At the top, there's a search bar with a placeholder 'Search for' and a magnifying glass icon. To the right of the search bar are three icons: a grid, a user profile, and a 'New' button. Below the search bar is a grid of eight library items, each represented by a book icon and a title. The titles and their descriptions are:

- Clarity Branding and Logo
1 Connected Site
- Error Pages
1 Connected Site
- HR
1 Connected Site
- Leadership
1 Connected Site
- Legal
1 Connected Site
- Marketing Assets
1 Connected Site
- Product Images
1 Connected Site

At the bottom left, it says '20 Entries' and 'Showing 1 to 7 of 7 entries.' On the bottom right, there are navigation arrows and a page number '1'.

Next, you'll return to Clarity's master pages and use the imported branding images.

Exercise 9b: Adding Clarity's Logo to the Master Pages

Clarity's master page templates are mostly complete. However, we still need to add Clarity's logo to the header and footer. Here you'll add these images as Walter Douglas.

To do this,

1. Go to *Clarity Public Enterprise Website*.
2. Open the *Site Menu* (grid icon), expand *Design*, and select *Page Templates*.
3. In the *Master* tab, click *Primary Master Page* to begin editing it.
4. Double click the header's *Image* fragment.

This selects the fragment's *image-square* sub-element and opens its configuration options.

5. In the configuration side panel, click *Select Image* (+).
6. Click *Sites and Libraries* in the breadcrumb menu.

7. Go to the *Asset Library* tab.

You should now see all asset libraries connected to this site.

8. Select *Clarity Branding and Logo*.

9. Select `logo-name-vector` to add the image to the header.

Tip: If you're having difficulty finding the image, use the search bar.

10. In the configuration side panel, go to the *Link* tab and configure these settings for the image-square element:

Tab	Setting	Value
Link	Link	Page
Link	Page	Home

Now when users click the header image, they're directed to Clarity's Home page.

11. Repeat these steps for the footer image fragment, selecting the `logo-full-name-vector` instead.

12. Click *Publish Master* to save your changes to the master page template.

All pages using the master page are now automatically updated.

Important: If the image does not update for you, you must clear the Liferay server's cache. To do this, sign in as the Clarity Admin user, open the *Global Menu* (grid icon), go to the *Control Panel* tab, and click *Server Administration*. Then, click *Execute* for the "Clear content cached across the cluster" operation.

13. Repeat steps 4-10 to update the header image in the *Secondary Master Page* template to use [logo-name-vector](#).

Great! So far you've learned how to create asset libraries, import content, and display it in pages. Next, you'll create a unique web content structure.

Exercise 10a: Creating Web Content Structures

Web content articles are content items that you can create, edit, and manage through Liferay's built-in content management system (CMS). You can also define structures for web content to create different types of content with different fields.

The training workspace includes most of the custom web content structures Clarity needs. Here you'll add the Announcements structure as Christian Carter.

To do this,

1. Sign in as Christian Carter.
 - Email: christian.carter@clarityvisionsolutions.com
 - Password: [learn](#)
2. Open the *Global Menu* (), go to the *Applications* tab, and click *Asset Libraries*.
3. Select the *Marketing Assets* library and *Web Content*.

4. Go to the *Structures* tab and click *New*.
5. Enter **Announcements** for the title.
6. From the *Builder* sidebar, drag and drop a *Text* field into the structure.
7. Select the *Text* field and configure these options:

Tab	Field	Value
Basic	Label	Message
Basic	Required Field	Yes
Advanced	Field Reference	message

8. Click the *back arrow* (◀) to return to the Builder sidebar menu.
9. Drag and drop another *Text* field just below the first one.
10. Select the *Text* field and configure these options:

Tab	Field	Value
Basic	Label	Link Text
Basic	Required Field	Yes
Advanced	Field Reference	linkText

11. Return to the Builder sidebar menu.
12. Drag and drop a *Link to Page* field on top of the *Link Text* field.

This creates a *Fields Group* that contains both *Link Text* and *Link to Page*.
13. Select the *Link to Page* field and configure these options:

Tab	Field	Value
Advanced	Field Reference	linkPage

14. Click *Save*.

The screenshot shows the Liferay 'New Structure' interface for creating a new structure named 'Announcements'. The 'Message' field is empty. The 'Link Text' field is also empty. The 'Link to Page' field has a placeholder 'Select' and is currently empty.

Users can now create web content articles using the Announcements structure. Next, you'll create some web content articles.

Exercise 10b: Creating Web Content Articles

The training workspace includes some web content articles. However, Clarity also needs some FAQ and announcement articles. Here you'll create them as Christian Carter.

To do this,

1. Open the *Global Menu* (grid icon), go to the *Applications* tab, and click *Asset Libraries*.
2. Select the *Marketing Assets* library and click *Web Content*.
3. Click *New*, select *Folder*.
4. Enter these values:

Field	Value
Name	Announcements
Description	Stores announcement articles for the page header.

Tip: It's best practice to organize your web content into folders instead of adding it to the home folder.

5. Click *Save*.
6. Click the *Announcements* folder.
7. Click *New* and select *Announcements*.
8. Enter these values:

Field	Value
Title	Product Innovations
Message	See Clarity's latest eyewear innovations!
Link Text	Learn more
Link to Page	Products

Note: When selecting the page, click the *Sites and Libraries* in the breadcrumb menu and select *Clarity Public Enterprise Website*.

The screenshot shows the 'New Web Content' creation interface. At the top, there is a header bar with a back arrow and the text 'New Web Content'. Below the header, the title 'Product Innovations' is displayed next to a small American flag icon and a 'Cancel' button. The main form area contains several input fields and sections:

- Message ***: A text input field containing the message "See Clarity's latest eyewear innovations!".
- FIELDS GROUP**: A section header.
- Link Text ***: A text input field containing the link text "Learn more".
- Link to Page**: A section header. Below it, a dropdown menu shows "Pages > Products" and two buttons: "Select" and "Clear".

9. Click *Publish*.
- Next, you'll add some missing web content articles.
10. Click *Web Content* in the breadcrumb menu.
11. Go to *FAQ* folder → *Retail Partners* subfolder.
12. Create these FAQ articles:

Title (Question)	Answer
Can I become a retail partner?	Yes, we are always looking to expand our network of retail partners. If you are interested in stocking our eyewear, please contact our sales team for more information.

Title (Question)	Answer
Do you have retail partners where I can try on your eyewear?	Yes, we have partnered with various optical shops where you can try on our eyewear. Please visit our website to find the nearest location.
What types of eyewear do you offer?	We offer a wide range of eyewear including prescription glasses, sunglasses, and contact lenses. We also have a collection of designer frames to suit different styles and preferences.

The screenshot shows a Liferay DXP interface for managing web content. At the top, there are tabs for 'Web Content', 'Structures', and 'Templates'. Below the tabs is a toolbar with icons for 'Filter', 'Order', a search bar labeled 'Search for', and a 'New' button. The main content area displays a list of three items under the heading 'Home > FAQ > Retail Partners'. Each item has a checkbox, a preview icon, a title, a modification timestamp, the author's name, and a green 'APPROVED' button. The titles are: 'What types of eyewear do you offer?', 'Do you have retail partners where I can try on your eyewear?', and 'Can I become a retail partner?'. Each item also includes a 'More' button represented by three dots.

Great! You should have all the web content Clarity needs for their pages. Next, you'll map some content to fragments on Clarity's home page.

Exercise 10c: Mapping Content to Fragments

Many fragments include sub-elements with their own configuration options, which depend on the sub-element's type. Available types include

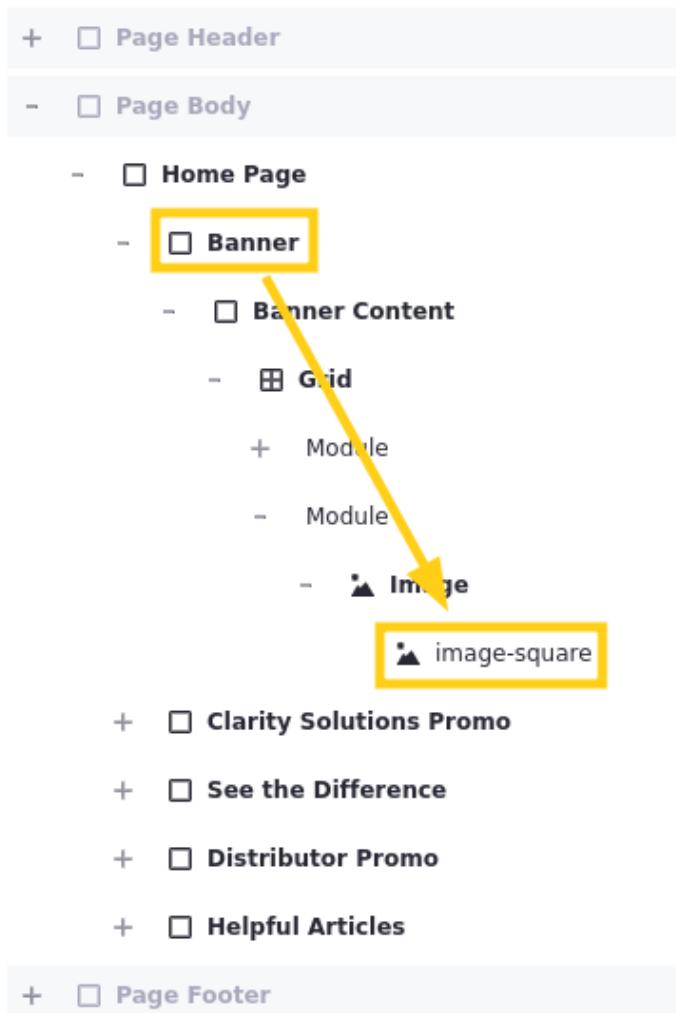
- Simple Text Element
- Rich Text Element
- Link Element
- HTML Element
- Image Element

You can set each sub-element's content directly, or you can map them to existing content items so that they update dynamically. Here you'll map some image elements in the Home page to asset library images as Walter Douglas.

To do this,

1. Sign in as Walter Douglas.
 - Email: walter.douglas@clarityvisionsolutions.com
 - Password: [learn](#)
2. Begin editing Clarity's *Home* page.
3. In the Browser side panel (), select the *Banner* container.

4. Select the *Image* fragment in the *Banner* container. Notice that the fragment includes an image-square sub-element.
5. Select the fragment's *image-square* sub-element to access its mapping options.



6. For Source Selection, select *Mapping*.
7. For Item, click *Select Item* (+).
8. Go to the *Documents and Media* tab and click *Sites and Libraries* in the breadcrumb menu.

Web Content

Documents and Media

Blogs
Categories
Knowledge Base Articles
Products

Documents and Media

Filter Order Search for New

Sites and Libraries > Clarity Public Enterprise Website

Drag & Drop Your Files or Browse to Upload

9. Go to the *Asset Library* tab, select *Marketing Assets*, and select the image named **home-banner-narrow-no-background**.

10. For Field, select *File URL*. The image should appear in the Home page banner.

About Us Blog FAQ Careers

image-square

Image Source Link

Source Selection: Mapping

Item: home-banner-nar...

Content Type: Document
Subtype: Basic Document

Field: File URL

Field Type: Image

Resolution: Auto

Width: 640px
File Size: 227.00kB

11. Repeat steps 4-9 for the *Image* fragment in the Clarity Solutions Promo container and select the **sunglasses-on-shelves** image from the Marketing Assets asset library.
12. In the Browser side panel (), select the *Content Wrapper* container in the Clarity Solutions Promo container.

Here you'll use a background image instead of an image sub-element.

13. In the configuration side panel, go to the *Styles* tab.
14. Under Background, set Image Source to *Mapping* and select the **gradient-overlay** image from the Marketing Assets asset library.
15. For Field, select *File URL*. The texture should overlay the gradient promotion.

16. Repeat steps 12-14 for the *Distributor Promo* container and select the **home-promotion** image from the Marketing Assets asset library.

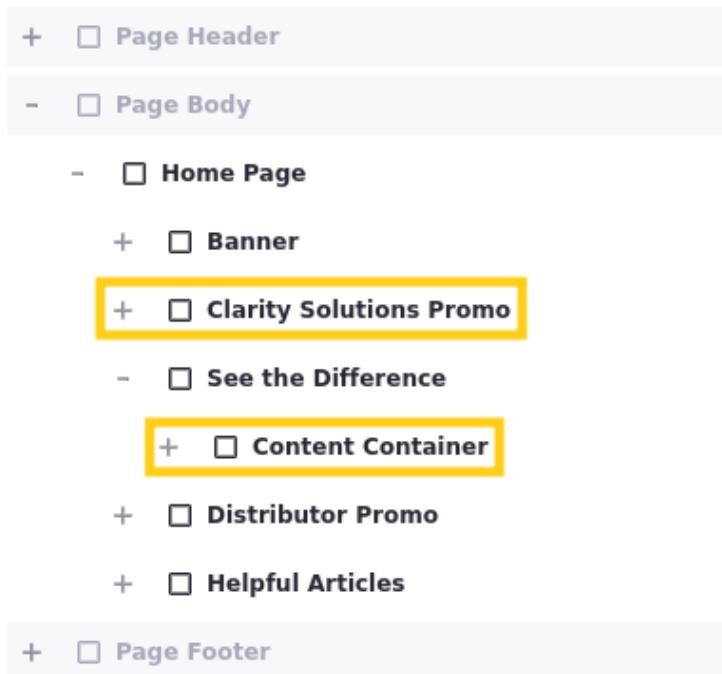
Once you've finished, you may notice that the image dimensions don't match Clarity's Home page design. Let's fix this.

17. Select the *Banner Content* container and configure this setting:

Tab	Setting	Value
General	Container Width	Fixed Width

18. Repeat the previous step for these containers

- *Clarity Solutions Promo*
- *Content Container* (under See the Difference)
- *Helpful Articles*



Now the contents of these containers should be fixed and the dimensions should better resemble Clarity's designs.

You have now mapped content from Clarity's asset libraries to the image fragments on their Home page. In later lessons, you'll map content fields to additional types of fragment sub-elements. But for now, you've completed all exercises for day one of Building Enterprise Websites!

Clarity

Products About Us Blog FAQ Careers Contact Us

Elevate Your Brand with Premium Eyewear

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Start Your Journey

See Further with Clarity Vision Solutions

A paragraph is a self-contained unit of a discourse in writing dealing with a particular point or idea. Paragraphs are usually an expected part of formal writing, used to organize longer prose.

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