Gather and Analyze Data with Liferay DXP

Lecture Script

# Introduction

Slide 1:

Hello, my name is [a first name you are comfortable with sharing] and I will be teaching you how to gather and analyze data with forms using Liferay DXP 7.4. Let us begin.

Slide 2:

The key takeaways from this module are:

* Forms are a versatile tool that can be used to gather both internal and external feedback.
* Form entries can be viewed and analyzed within the Liferay UI, exported as a CSV file, and edited or deleted as needed.
* Forms and Workflows can be combined using Kaleo Forms Process to create form-based business processes.

Slide 3:

Before beginning the exercises for this module, you will need to have:

* Java JDK installed to run Liferay DXP
* Unzipped module exercise files in the following folder structure:
  + Windows: C:\liferay
  + Unix Systems: [user-home]/liferay
* A running instance of Liferay DXP or CE 7.4
* The Marvin Robotics Site created using the Minium Site Accelerator

The download link shown on screen directs you to download Java JDK 8. While it is possible to run Liferay DXP on more recent versions of Java JDK, it may occasionally result in some errors.

Slide 4:

Our Use Case for this module is Marvin Robotics. Marvin Robotics is a manufacturing company that produces industrial robots that is using Liferay DXP to create both a B2B ecommerce store and a customer-facing Main Site for their business.

* Marvin Robotics needs to collect feedback in several areas and wants to create customer satisfaction for products and services, as well as RSVPs for special events, webinars, and prereleases.
* Marvin Robotics also has various internal processes that require forms that can be easily filled out and transferred directly to the appropriate personnel, such as work and service orders, that they’d like to replicate within their platform.

Slide 5:

*~[Continuation of list from previous slide, continue reading without break]~*

* Marvin Robotics also has various internal processes that require forms that can be easily filled out and transferred directly to the appropriate personnel, such as work and service orders, that they’d like to replicate within their platform.

Slide 6:

The relevant Key Performance Indicators that we will be focusing on for the Marvin Robotics platform are:

* Increase level of customer feedback gathered
* Improve the efficiency of internal processes that rely on forms
* Reduce form abandonment rates

# Gathering Feedback

Slide 7:

In this section we will look at some methods of gathering feedback within Liferay DXP.

Slide 8:

* In Liferay DXP, forms are entities that are created to gather data
* Forms can be used for a wide variety of applications including:
  + Surveys
  + Work Orders
  + RSVP Forms
  + Invoices
  + Registration Forms
* The Forms application is quite versatile and can enable many actions within a form itself, including:
  + Populate a field with a REST Data Provider
  + Add extra pages
  + Enable CAPTCHA
  + Store results in JSON
  + Enable workflows
  + Redirect to a different URL after a successful form submission
  + Send an email notification to administrators whenever a form is submitted
  + Provide a default value or a placeholder value for each field
  + Validate fields
  + Redirect users to a success page after form submission
  + Define Form Rules to create dynamic form behavior
  + Translate the form text into any supported language
  + Create partial forms and save them for reuse
  + Drag and drop fields onto the form layout
  + Duplicate a form instead of starting a similar form from scratch

Like many businesses, Marvin Robotics has many ways in which they can utilize the Forms application both internally, with employee surveys and maintenance request forms, and externally, with customer satisfaction surveys and order cancellation forms.

Slide 9:

* Forms are made up of a combination of fields
* Within Liferay DXP, the out-of-the-box field types are as follows:
  + *Paragraph* - A static text block with no user input that’s useful for adding titles and descriptions to a form.
  + *Text Field* – A single line or multiline area where users input text that’s useful for open-ended prompts like Name or Address.
  + *Select from List* – Users select one or more options from a list of choices that can be entered manually or populated by a data provider.
  + *Single Selection* – Users choose a single option from a list using a radio button. This is useful for fields that include a short list of options that require a single answer, such as selecting a meal option for a catered event.
  + *Date* – Users select a date using a date picker.
  + *Multiple Selection* – Users select one or more options from checkboxes or toggles.
  + *Grid* – Users select options from a matrix. This is useful for surveys that require responses on a scale of 1 to x or similar formats.
  + *Numeric* – Users input an integer or decimal. This field will automatically invalidate any non-numeric responses.
  + *Upload* – Allows users to upload files via Documents or Media. This field is useful if a form requires complementary documentation such as a resume, insurance information, or pictures.
  + *Confirmation* – Requires users to re-input information from another field such as a password or email address.
  + *Boolean* – Allows users to receive a quick direct answer by limiting a question to two choices such as true or false.
  + *Search Location* – Allows users to select their location using Google Maps. This field is useful if a form requires geographical data such as an accident location for a car insurance claim.

Marvin Robotics can combine the available fields to create a number of different useful forms. For example, they can create a Customer Survey where the Text Field is used to collect names, the Single Selection to ask for a 1-5 satisfaction rating, and the Multiple Selection to ask what products were purchased.

Slide 10:

* Form Rules enable form fields to be trained to perform specific actions. They consist of one or more conditions and actions.
  + *Conditions* determine whether any actions are executed
  + *Actions* determine what happens when a condition is met
* Conditions and actions are linked via AND/OR logic.
  + If OR is selected, the action is triggered if any of the specified conditions are met.
  + If AND is selected, the action is triggered only if **all** the specified conditions are met.
* It’s important to note that Form Rules can only be created after the form they will be used on has been created and its layout established.
* Form Rules are also one of Liferay DXP’s extension points, which means that custom rules can be created and implemented alongside those available out-of-the-box.

Marvin Robotics has the option of enabling Form Rules to remove the need for those completing a form to fill out unnecessary and/or irrelevant fields. This both saves time and lessens frustration while filling out the form, making it more likely that those filling out optional forms, such as Marvin Robotics’ customer satisfaction survey, will complete them.

Slide 11:

* When building a rule, you must specify a field (for example, *Are you over 18?*), a condition (*Is equal to*), and the Value (*Yes/ No*) to be compared against. If the condition’s *if statement* is *true*, the action is triggered. If it is *false*, nothing happens.
* These *if statements* can be used to check whether a particular field:
  + *Is equal to* a specified value or another field’s value
  + *Is not equal to* a specified value or another field’s value
  + *Contains* a specified value or another field’s value
  + *Does not contain* a specified value or another field’s value
  + *Is empty*
  + *Is not empty*

Marvin Robotics can utilize conditions in their forms to enable several different actions which will be covered in the following slides. For example, in an RSVP form for a special event, they could use the *Is equal to* condition to enable fields that only appear if the respondent sets the *Attending* field to *Yes*.

Slide 12:

* The **show and hide** action can be used to display or hide certain fields based on user input
* For example, a permission form that shows a *Legal Guardian Email* field if the user filling out the form is under 18 could hide that same field if the respondent selects a value of *Yes* for the *I am 18 Years Old or Older* field.

Marvin Robotics can utilize the *show and hide* action in an RSVP form for a special event to hide a field asking for food selection if the respondent answers *No* to the *Attending* field.

Slide 13:

* The **require** action can be used to make certain fields mandatory, depending on user input
* For example, a permission form could set a requirement for a legal guardian’s contact information if the user filling out the form is under 18.

Marvin Robotics can utilize the *require* action in their Customer Satisfaction Survey to require certain Contact Information fields if the respondent selects *Yes* to a field asking if they would like to receive regular updates from Marvin Robotics about new offers and products.

Slide 14:

* The **enable and disable** action allows certain fields to allow or disallow user input
* For example, a medical release form that asks the participant to list any known allergies could have two fields, a Single Selection labeled *Do you have any known allergies?* and a Text field for listing known allergies.
  + If the Single Selection’s value is *Yes*, the Text Field is enabled, and the participant can list their known allergies.
  + If the Single Selection’s value is *No*, the Text Field is disabled, and the participant can move on to other fields in the form.

Marvin Robotics can utilize the *enable and disable* action in their annual Employee Satisfaction Survey to disable irrelevant fields for certain types of employees such as fields related to the state of their manufacturing plant if the respondent works in their corporate office.

Slide 15:

* The **jump to page** action automatically navigates to a specific page of the form based on user input. This is useful for forms that contain pages that are not applicable to all users and will skip all sections, including those marked as required, on the skipped pages. As you might guess, this means that the *jump to page* action can only be used on multi-page forms.
* For example, a membership form that includes pages that are only applicable to new members could include a field that asks whether the individual is a returning member; if the answer is *Yes*, then the form could skip over pages that pertain only to new members.

Like the *enable and disable* action, Marvin Robotics will use the Jump to Page action to help respondents skip through unnecessary or irrelevant sections, though at a larger scale in terms of fields that are bypassed. Utilizing this action within relevant forms will make respondents more likely to complete the forms since it removes the hassle of filtering through irrelevant sections.

Slide 16:

* The **autofill** action changes the selection options of another field based on the user input of a related field. This related field is populated with output from a data provider which must be set up before configuring an *autofill* action.
* For example, an interest survey that matches prospective guests with resorts based on their travel preferences could be created with a data provider that is set up to populate the options for a Select From List field with resorts that are offering special discounts if a field labeled *Traveling on a Budget?* has a value of *Yes*.
* For instructions on setting up a data provider in Liferay DXP, visit the *Data Providers* section under *Forms* on learn.liferay.com.

Marvin Robotics can utilize the Autofill action to recommend certain products based on the responses of individuals filling out a Product Interest Form that matches an industrial robot with a potential customer’s manufacturing needs and specifications.

Slide 17:

* The **calculate** action automatically populates a Numeric field by calculating its value based on other fields.
* For example, an order form could be created using a *calculate* action to automatically calculate the order’s total price based on the items selected.

Marvin Robotics will generally not use the Calculate action within its forms simply because the B2B tools within Commerce will perform any relevant calculations much more accurately and efficiently for their use case. That said they could potentially use this action within the Product Interest form to give prospective buyers an idea of the cost of their recommended product.

Slide 18:

* **Element sets** are reusable sets of fields that also include the layout and configuration of those fields. They are created using an identical process to creating forms but cannot be published by themselves. They can, however, be combined with other fields and element sets to create forms and are added to a form in the same way as other form elements.
* Much like templates for Web Content, Pages, and Sites, element sets are most useful for quickly generating new forms. One advantage they have over other template types is that they can be combined with other fields and element sets to create more robust forms that go beyond the scope of the set itself.

Marvin Robotics can utilize element sets in the creation of several of their business-process related forms, such as an Item Description set that includes fields for item description, quantity, and price, which could be used for forms ranging from invoices to packing slips.

Slide 19:

* There are many other useful features of forms that all act in the interest of either expediting or improving the process of creating and filling out forms including:
  + Translating forms
  + Adding form success pages
  + Adding help and placeholder text
  + Providing predefined values
  + Autosaving an in-progress form
  + Autocompleting text in a text field, and
  + Duplicating forms and form fields

Since Marvin Robotics does some business in the EU, they will utilize the form translation feature to cater to their non-English speaking customers.

Slide 20:

* **Dynamic data lists** display forms from field sets called *data definitions* which consist of a form’s field types and those fields’ labels and settings.
* Dynamic data lists provide a tool within the UI for building reusable forms and list-based applications intended for display on pages through the use of templates.
* While they have a number of different practical applications, dynamic data lists are used primarily in the following situations:
  + You need a way for users to enter data that will be displayed in the UI
  + You need to style lists and forms with templates
  + You need to utilize Color, Geolocation, Web Content, or Link to Page fields
* A key advantage of dynamic data lists is the fact that they are flexible, meaning you don’t have to restrict dynamic data lists to a simple input. You could create something as complex as an entire data entry system for real estate listings, or any other simple list-based application you can dream up. While creating data definitions and data lists doesn’t require any coding, additional formatting can be added with FreeMarker Templates.

Marvin Robotics can create a Dynamic Data List for their Product Interest form, enabling potential customers to enter their manufacturing needs within the UI and receive a product recommendation.

Slide 21:

So, what does this mean for Marvin Robotics?

Marvin Robotics plans to utilize the Forms application to create the following:

* An Element Set for webinar RSVPs
* A Customer Satisfaction form to be administered to new customers
* A New Product Interest form to gauge customer interest in new product types

Slide 22:

Now it’s time for a knowledge check on what we’ve learned about forms.

* [pause for fill-in-the-blank] created for Marvin Robotics could potentially range in complexity from a single field response to a multi-page questionnaire about customer satisfaction.
* Form rules enable fields to perform specific tasks and consist of at least one [pause for fill-in-the-blank] and one [pause for fill-in-the-blank], for example, a response of “No” triggering a jump to the final page of an RSVP form created for a Marvin Robotics webinar.
* Should Marvin Robotics wish to develop a template for use in future form creation, they should develop an [pause for fill-in-the-blank], a group of fields and their associated configurations which can be reused across various forms.

Now take some time to pause the video and fill in the blanks.

Slide 23:

And here are the answers to the knowledge check: [read bullet points]

* **Forms** created for Marvin Robotics could potentially range in complexity from a single field response to a multi-page questionnaire about customer satisfaction.
* Form rules enable fields to perform specific tasks and consist of at least one **action** and one **condition**, for example, a response of “No” triggering a jump to the final page of an RSVP form created for a Marvin Robotics webinar.
* Should Marvin Robotics wish to develop a template for use in future form creation, they should develop an **element set**, a group of fields and their associated configurations which can be reused across various forms.

**Slides 24 - 27 [skip]**

# Addressing Feedback

Slide 28:

In this section we will explore our options for addressing the feedback we receive from forms in Liferay DXP.

Slide 29:

* In Liferay DXP we refer to completed and submitted form responses as **form entries.**
* There are four potential actions that can be taken once our form entries have been submitted:
  + View
  + Edit
  + Export
  + Delete
* To prevent tampering with results, the ability to edit form entries should be restricted to a minimal number of users and should primarily be used to correct errors in submissions.

Slide 30:

* As users fill out forms, they are generating data that can be viewed and analyzed. These form entries can be viewed collectively or individually, should specific entries need to be viewed.
* To deter automated form submissions, and thereby remove unhelpful or irrelevant data, CAPTCHA can be enabled for form submissions.

While they generally export form data for easier analysis, Marvin Robotics will view form entries within the Liferay DXP UI, particularly when referencing information for forms used within their Kaleo Forms process, which will be discussed in the next section.

Slide 31:

* Form entries can be exported to a spreadsheet to assist with data analysis.
* These entries can be exported as a CSV file, which requires system level approval from an administrator, or as a JSON, XLS, or XML file.
* Once the form entries have been exported, they can be deleted either collectively or individually from the instance.

Slide 32:

So, what does this mean for Marvin Robotics?

Marvin Robotics will do the following with their form entries:

* Export Customer Satisfaction surveys for further analysis into how to better serve their customers
* View RSVP responses to special events and webinars
* Export and store internal forms used in regular business process such as order processing and management

Slide 33:

Now it’s time for a knowledge check on what we’ve learned about form entries.

* Once form entries have been submitted, Marvin Robotics has the ability to [pause for fill-in-the-blank], [pause for fill-in-the-blank], [pause for fill-in-the-blank], and [pause for fill-in-the-blank] them.
* Should Marvin Robotics decide to [pause for fill-in-the-blank] their form entries to a CSV file, they will need to have an administrator enable the option at a [pause for fill-in-the-blank] level.

Now take some time to pause the video and fill in the blanks.

Slide 34:

And here are the answers to the knowledge check:

* Once form entries have been submitted, Marvin Robotics has the ability to **view**, **edit**, **export**, and **delete** them.
* Should Marvin Robotics decide to **export** their form entries to a CSV file, they will need to have an administrator enable the option at a **system** level.

**Slides 35-38: [skip]**

# Creating a Kaleo Forms Process

Slide 39:

In this section we will look at how we combine workflows with forms to model business processes in Liferay DXP.

Slide 40:

* **Kaleo Forms** combine the features of the *Workflow Designer* and *Dynamic Data Lists* to create form-based business processes. A form is associated with each task of a workflow at which point the completion and submission of the form becomes the condition by which the workflow continues to the next task.
* Within a Kaleo Forms process, you can either use existing forms and workflows or create new ones.
* To initiate a Kaleo Forms process, one must:
  + Open the *Site Menu*, and go to *Content & Data* → *Kaleo Forms Admin*.
  + Click on the *Kaleo Forms process* you want to use, and then click on the *Add* button. This redirects you to the initial form for the selected process.
  + Fill out the initial form and click *Save* to complete the first workflow task.
* Once saved, the workflow engine implements the prescribed process, and users assigned to subsequent workflow tasks are notified. These tasks can be viewed under *My Workflow Tasks* in the *Personal Menu*. From here, you can click on the process to complete your assigned task, editing, rejecting, or approving the designated task form to move the process forward to resolution. Available options and conditions are defined by the selected Kaleo Forms process.

There are several B2B processes that Marvin Robotics can model using a Kaleo Forms Process, including work/service orders, order management (which will be used as an example on the following slides), and raw material orders.

Slide 41:

So, what does this mean for Marvin Robotics?

Pictured here is the workflow for a Kaleo Forms Process designed to reflect the process by which Marvin Robotics processes and manages orders. While Liferay Commerce does have a built-in order management system and can be integrated with existing order management systems, the addition of a Kaleo Forms process allows Marvin Robotics employees to generate things like invoices, purchase orders, and packing slips throughout the process, notifying the proper Users at each stage.

Slide 42:

This is the form associated with the first task of the Kaleo Forms Process. At this stage, the order has just been placed by a customer and the Account Manager for that customer creates a purchase order. The workflow now splits, with one branch headed towards Financial and the other towards the Manufacturing Floor.

Slide 43:

This is the form associated with the task in the right branch of the Kaleo Forms Process. At this stage, the order has been received by Marvin Robotics’ Financial Department and an invoice is being created to be sent to the customer.

Slide 44:

This is the form associated with the task in the left branch of the Kaleo Forms Process. At this stage, the order has been fulfilled by Marvin Robotics and a packing slip is being created to be sent along with the shipment.

Slide 45:

Now it’s time for a knowledge check on what we’ve learned about Kaleo Forms.

* Kaleo Forms combine the qualities of the [pause for fill-in-the-blank] and [pause for fill-in-the-blank], enabling businesses like Marvin Robotics to mimic their real-world business processes.
* When creating Kaleo Forms, Marvin Robotics can utilize the following types of forms and workflows within their structures:
  + [pause for fill-in-the-blank]
  + [pause for fill-in-the-blank]

Now take some time to pause the video and fill in the blanks.

Slide 46:

And here are the answers to the knowledge check:

* Kaleo Forms combine the qualities of the **Workflow Designer** and **Dynamic Data Lists**, enabling businesses like Marvin Robotics to mimic their real-world business processes.
* When creating Kaleo Forms, Marvin Robotics can utilize the following types of forms and workflows within their structures:
  + **Existing**
  + **Newly Created**

**Slides 47-50: [skip]**

# Gather and Analyze Data with Liferay DXP Summary

Slide 51:

Now it is time to go over what we have learned about Gathering and Analyzing Data with Liferay DXP.

* Forms are a versatile tool within Liferay DXP that enable businesses to gather both internal and external feedback.
* Form rules enable fields to be trained to perform specific tasks based on user input and consist of at least one action and condition.
* Forms contain numerous useful features that assist in their creation and submission, including element sets, predefined values, and localization features.

Slide 52:

* Submitted forms are referred to as form entries, which can be viewed, exported, or deleted.
* Kaleo Forms can be used to create form-based business processes, combining the Workflow Designer with Dynamic Data Lists.

Slide 53:

Check out learn.liferay.com for more information on using forms and Kaleo Forms Processes in Liferay DXP, as well as other Liferay products.