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Lab Guide

Creating Custom Applications from Scratch

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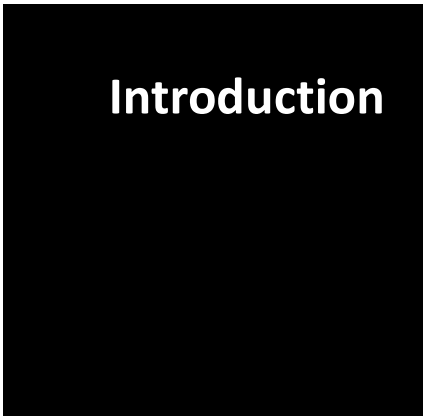
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Introduction



ServiceNow Powers Enterprise Service Management

Every person in the enterprise is a service provider. Service relationships are well defined and automated within IT; however, they are often inefficient, unstructured, or nonexistent in other enterprise service domains. Savvy IT leaders view this as an opportunity to help their business peers replace inefficient email-based service request and fulfillment processes with a proven IT service model.

The ServiceNow Service Automation Platform is designed to enable rapid development of such applications. The platform empowers you to build custom functionality and incorporate mobile and collaboration elements with little to no coding.

Context for Workshop Application

In the following tutorials, you build an event management application for a fictitious company called Gumball Tech. Gumball Tech is a large high-tech firm based in Silicon Valley. Its Marketing department conducts many marketing events around the world.

The event coordinators struggle with organizing the events and managing equipment like computers and projectors. They also need to manage the attendee lists and notifications to attendees.

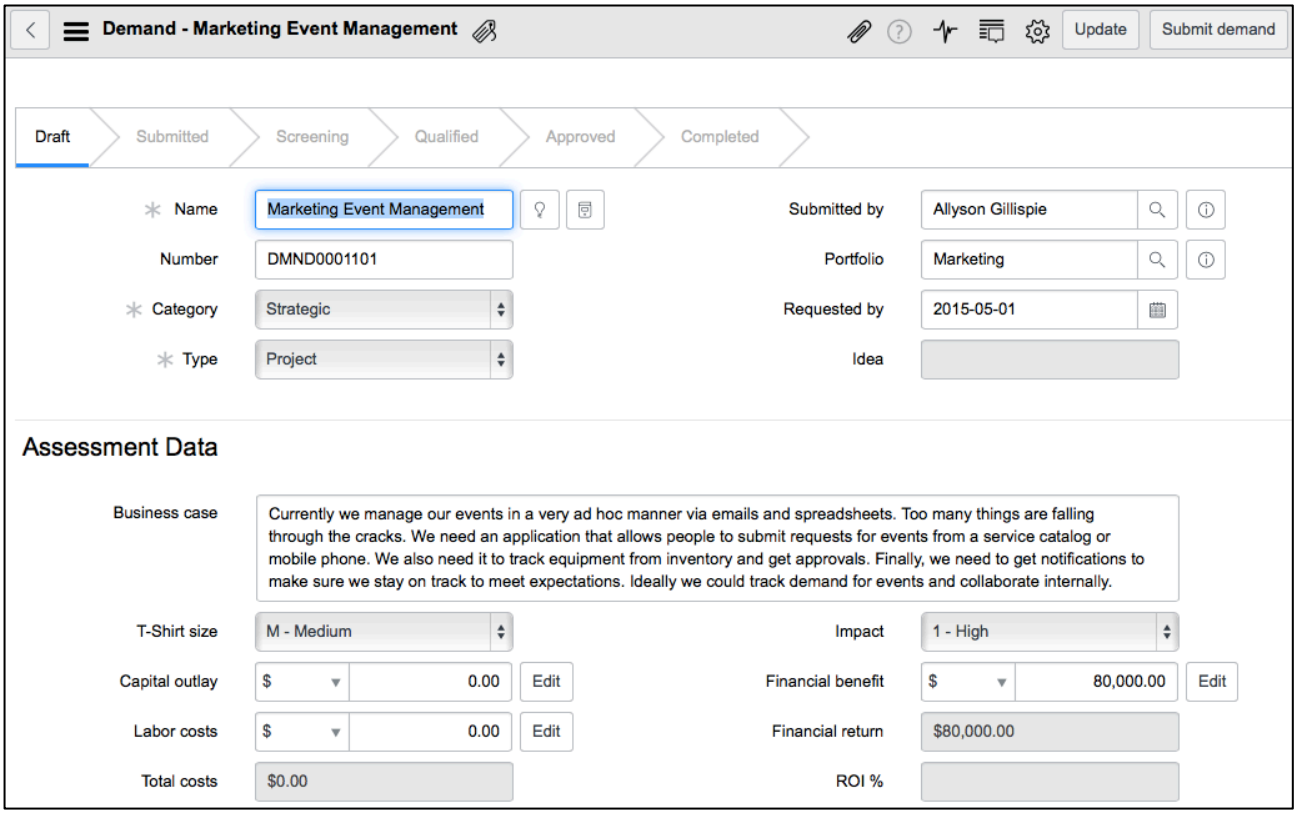
Currently, Gumball Tech manages events with a combination of Excel, e-mail, and phone calls. One of the marketing groups in Europe is also using a document stored in a personal Google Docs account. This has IT worried about security since that document includes a list of prospect names.

This fragmented approach means that event managers do not always have completely accurate lists of the attendees contacted by sales. It is also common to have a critical piece of equipment missing on the day of a show. Marketing executives do not have visibility into the performance of the events because the report from each event manager has a different format and the numbers shown are sometimes not trustworthy.

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Application's Value to the Business

The marketing VP approached the IT department to build a new application on the ServiceNow platform by entering a new demand in the Demand Management application.



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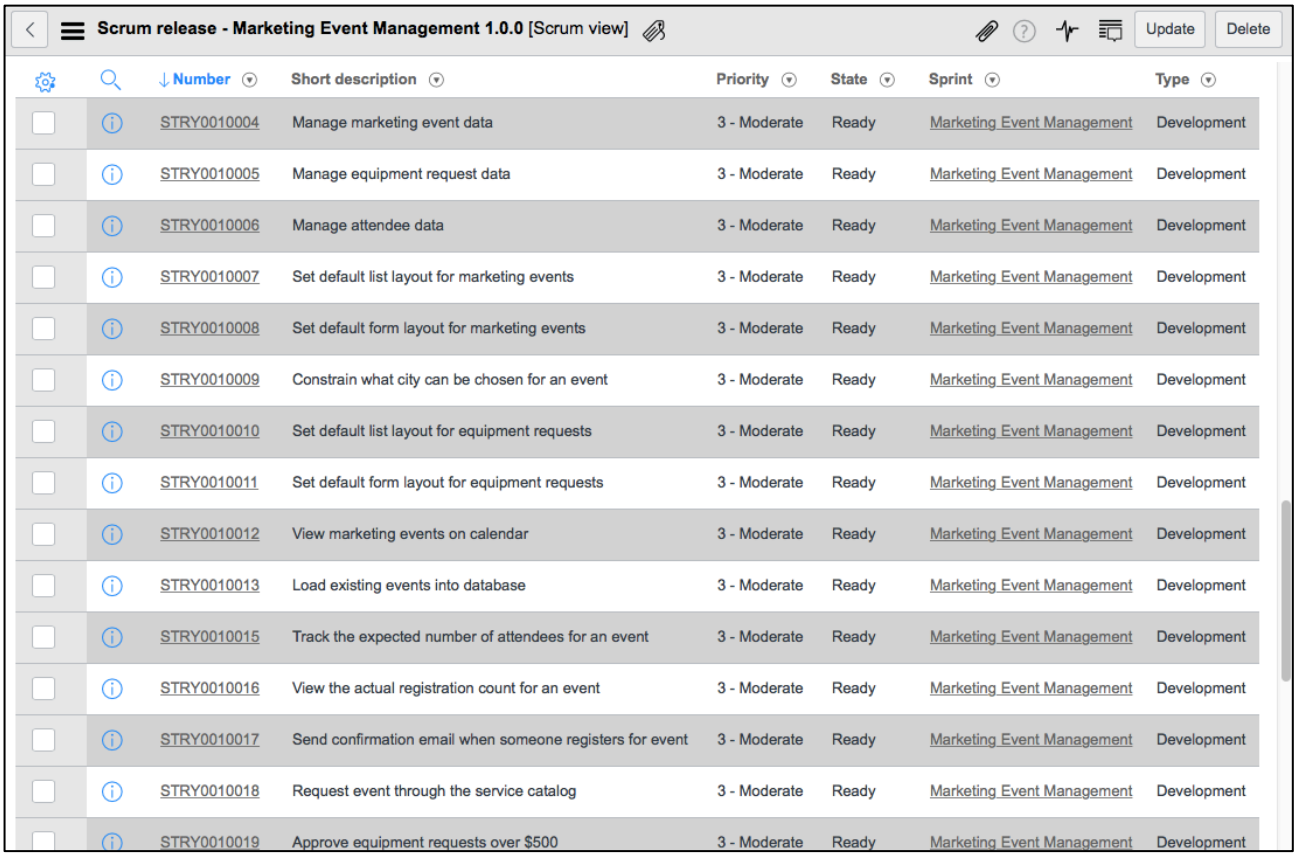
In the demand record, the VP explains that this application should provide value to all event managers and marketing executives. The table below lists the users and benefits.

Application User	Benefits
Marketing Events Manager	• Centralized place to manage all aspects of every event such as attendees, attachments and equipment • No more spreadsheets and things falling through the cracks • Real time status on attendees
Marketing Director / Management	• Visibility into events • Visibility into team's performance across geographies
IT Administrator	• Easy import of data from legacy system • Integration with corporate LDAP • Easy enforcement of security rules • Automatic upgrades of the platform
Attendee	• Intuitive, self-service registration • Timely e-mail reminders

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Managing the Implementation

Once the request for the application is taken through the demand management process and approved for implementation, an enhancement request is created. The Product Owner and the application development team use that enhancement request as the parent for a set of stories that cover the requirements for the new application.

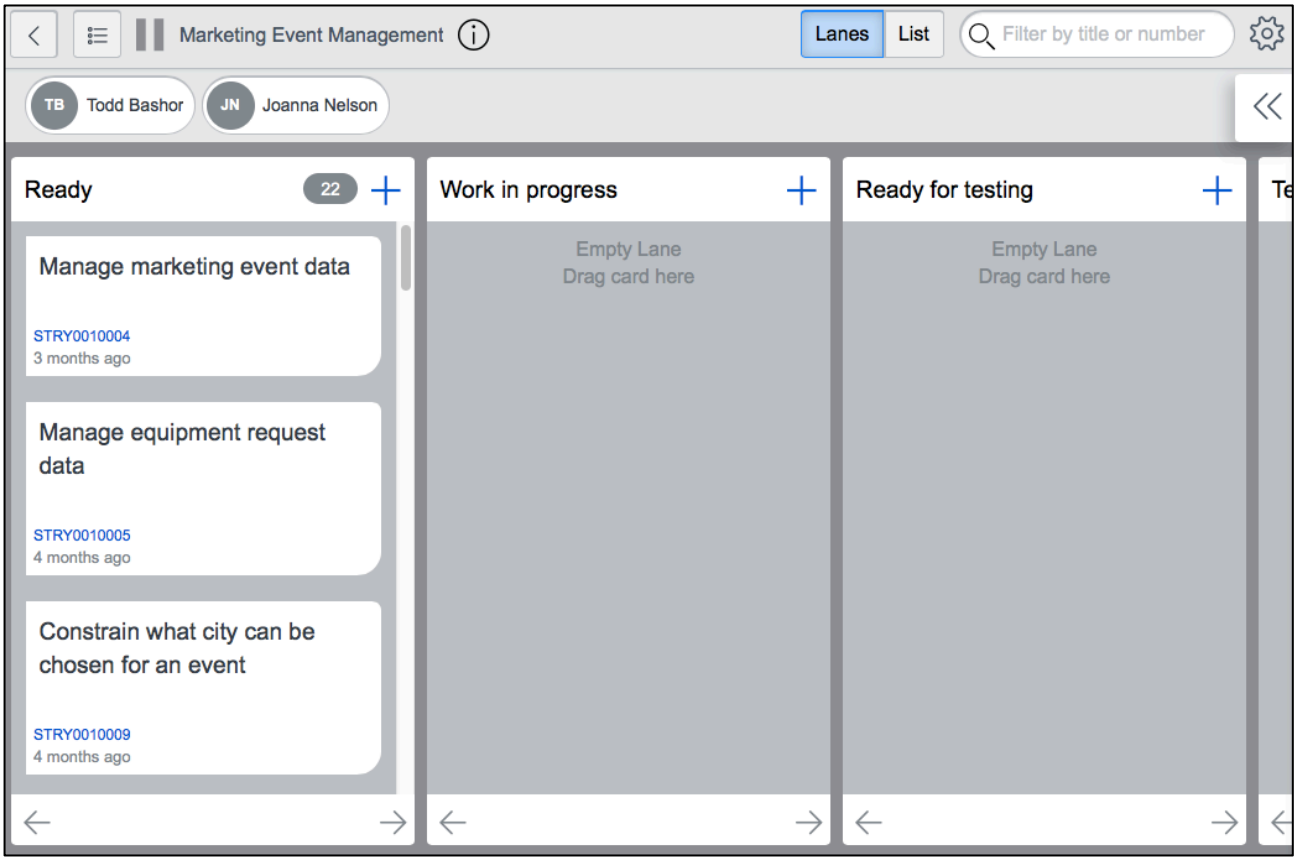


Scrum release - Marketing Event Management 1.0.0 [Scrum view] Update Delete

Number	Short description	Priority	State	Sprint	Type
STRY0010004	Manage marketing event data	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010005	Manage equipment request data	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010006	Manage attendee data	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010007	Set default list layout for marketing events	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010008	Set default form layout for marketing events	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010009	Constrain what city can be chosen for an event	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010010	Set default list layout for equipment requests	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010011	Set default form layout for equipment requests	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010012	View marketing events on calendar	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010013	Load existing events into database	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010015	Track the expected number of attendees for an event	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010016	View the actual registration count for an event	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010017	Send confirmation email when someone registers for event	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010018	Request event through the service catalog	3 - Moderate	Ready	Marketing Event Management	Development
STRY0010019	Approve equipment requests over $500	3 - Moderate	Ready	Marketing Event Management	Development

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The development team uses the stories within the ServiceNow SDLC module to manage the implementation process. For a visual way to manage the work for this application, a Visual Task Board is created.



The instructor will show you how Visual Task Boards can make it easy to manage work and collaborate with others.

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Log on to Your Lab Instance

1. Navigate to the instance reservation URL provided to you by the instructor. For example: https://appcreation201instructor1.lab.service-now.com/instance_reservation.do
2. Enter your email address and click **Submit**.
3. Note the login credentials for the instance assigned to you. Click on the **link** to the instance.
4. Log on as **admin** with provided password.

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Start the Application

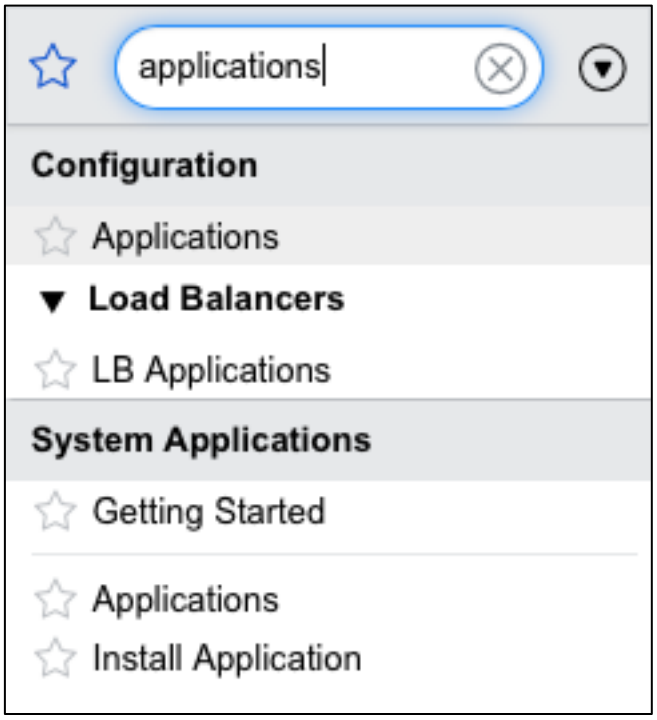
This lab explains how to create the initial application.

Lab 1
Start the Application

Choose How to Start the Application

In this section, you decide how to start the application and give the application a name.

1. Navigate to **System Applications > Applications** by typing **applications** in the application navigator filter box.

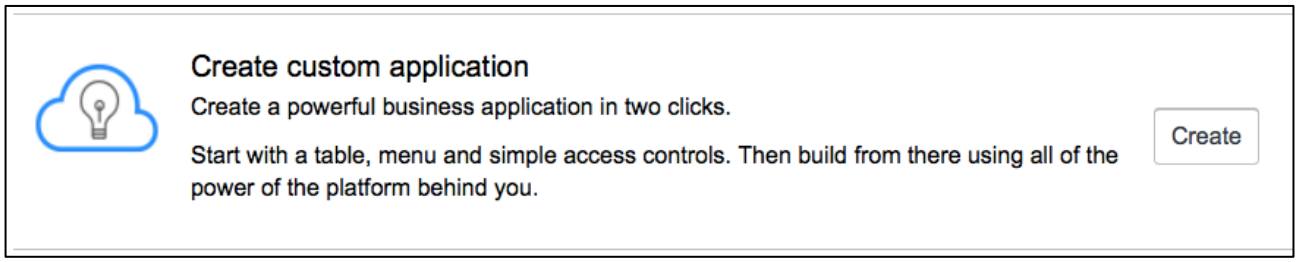


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2. In the **Develop** tab, click **New**.



3. In the **Get started building application** page, next to **Create custom application**, click **Create**.



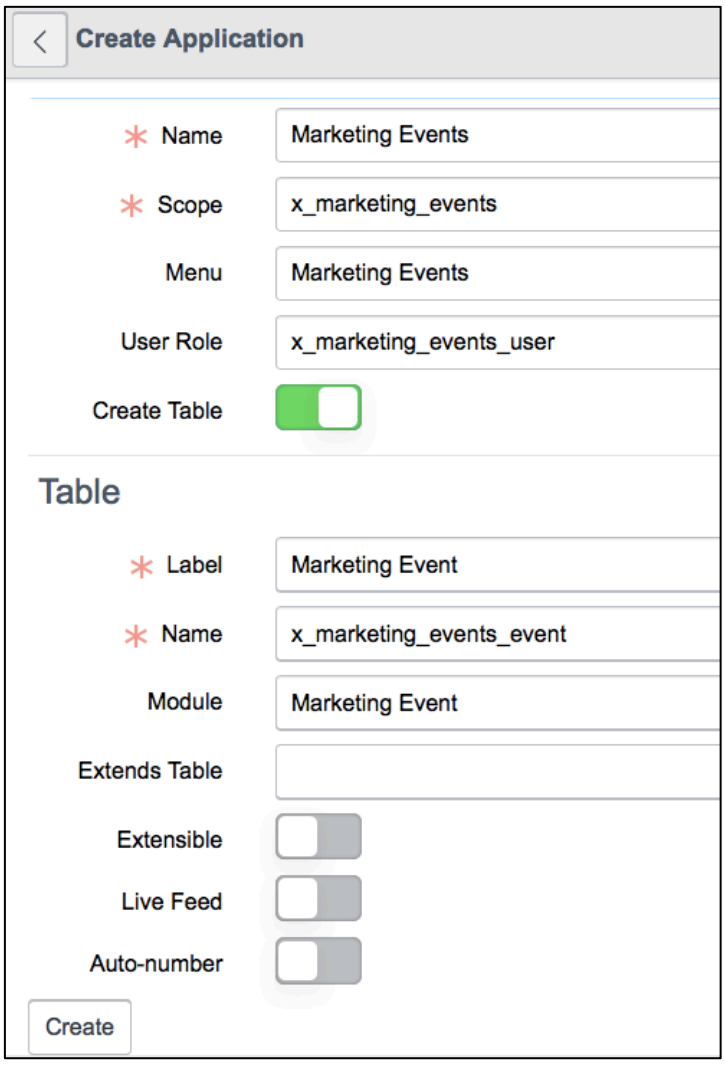
4. In the **Create Application** form, enter the following information (ServiceNow automatically fills in some fields based on the application name):

In this field…	Enter…
Name	Marketing Events
Create Table	On

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5. In the **Table** section, enter the following:

In this field…	Enter…
Label	Marketing Event
Name	x_marketing_events_event



6. Click **Create**.

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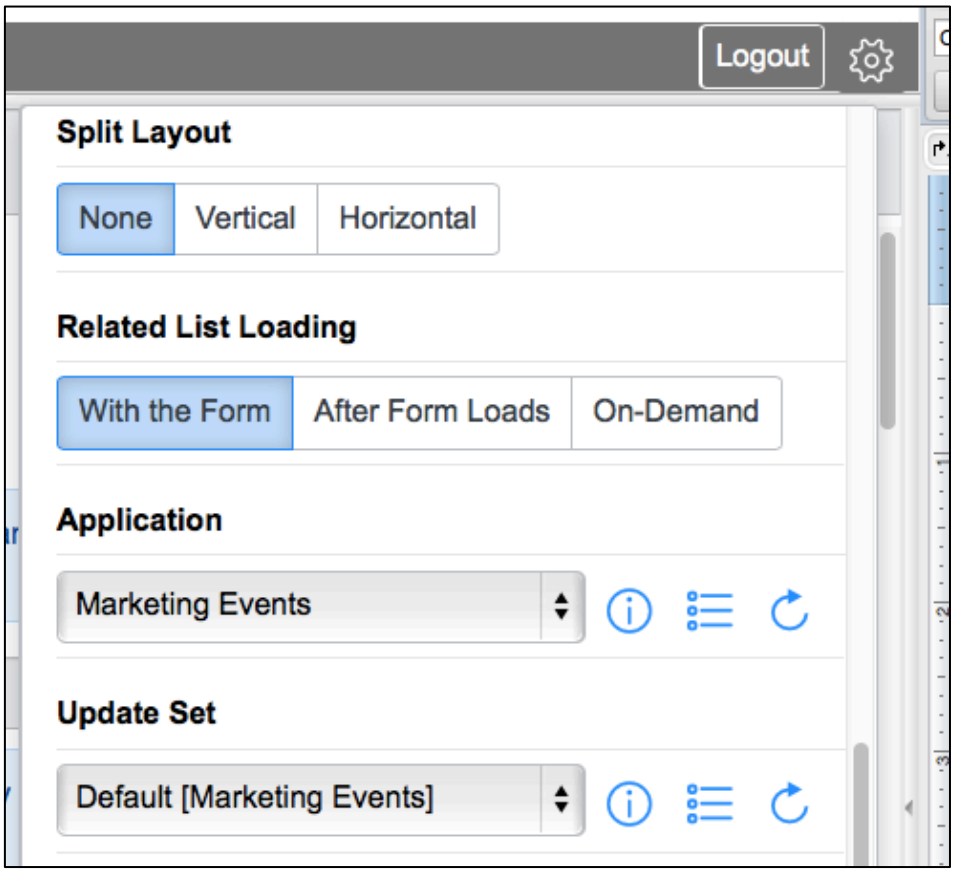
7. In the **Confirm Application** dialog, click **OK**.

8. In the **Application Creation** dialog, click **View app record**.

Verify Results

ServiceNow has created a new application named Marketing Events.

1. Click  in the banner area. Notice that the active **Application** has been set to this newly created application.



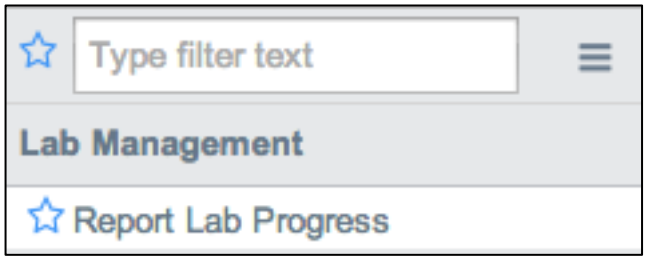
You created a new application, but it does not do much yet. The next lab explains how to start marking it functional.

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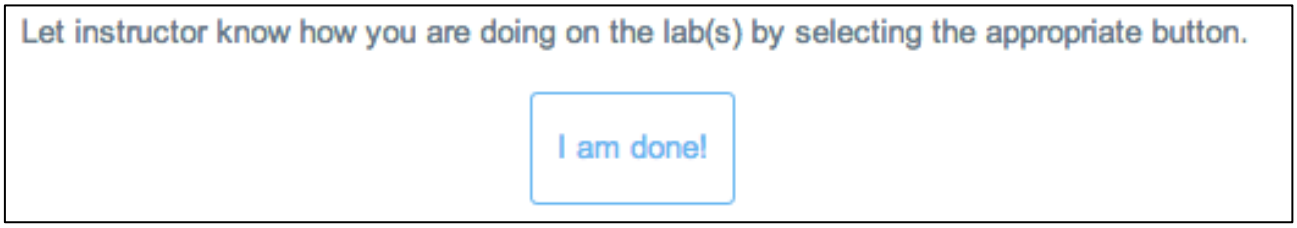
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done**!



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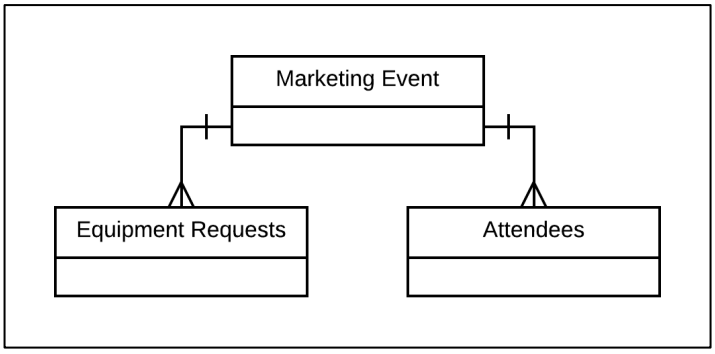
Create the Database Tables

Lab 2
Data Model

At the heart of every application is a database to store information. ServiceNow provides a relational database model for business objects. You can store the attributes of a business object and the relationships between them.

The application needs three objects:

- Marketing Event
  - Has a one-to-many relationship to Equipment Request and one-to-many relationship to Attendee.
- Equipment Request
- Attendee



This lab explains how to build the Marketing Event and Equipment Request tables. You build the Attendee table later.

Related Stories

As a Marketing Event Manager, I need to track information about a marketing event so that my colleagues and I can make sure the event runs smoothly.

As a Marketing Event Manager, I need to manage requests for equipment so that the right equipment is at the right place at the right time for the staff and speakers to use at the marketing events.

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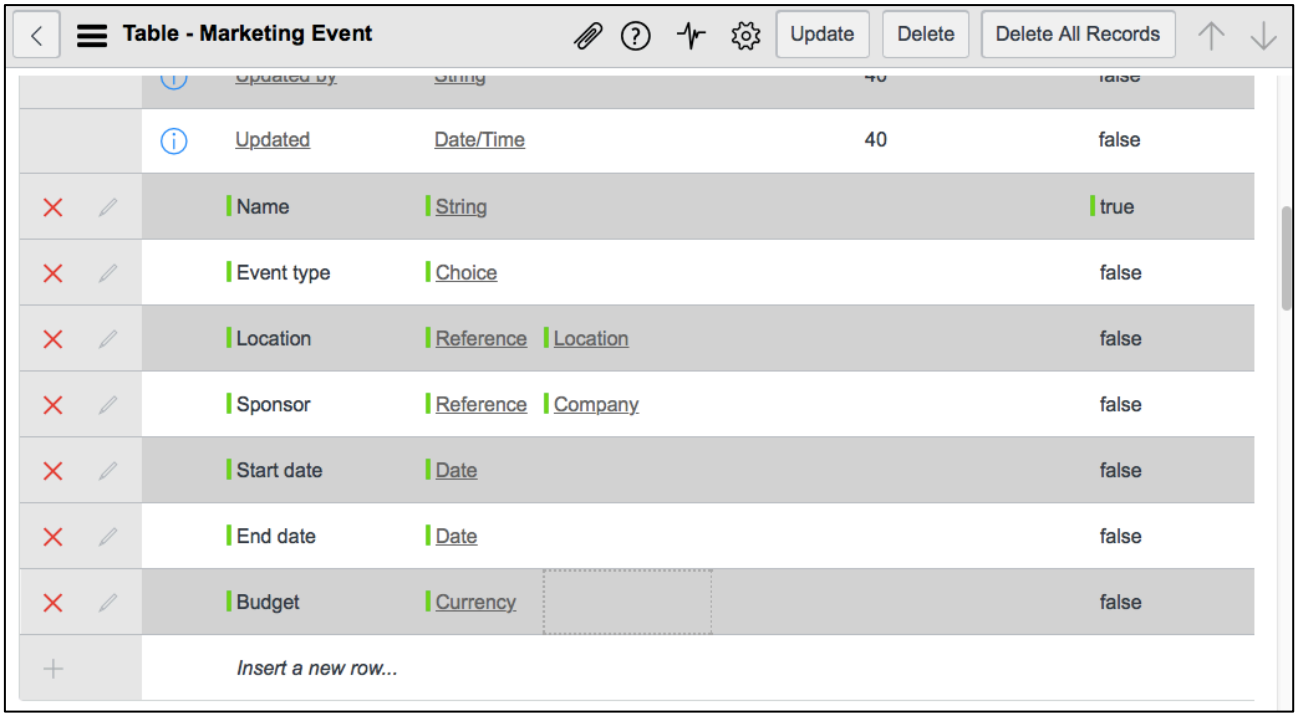
Add Fields to the Marketing Event Table

Creating the application created the Marketing Event table, but the table now only has system-generated fields. In this section, you add the fields required by the business.

1. In the **Custom Application – Marketing Events** form, in the **Tables** section, open the **Marketing Event** table.
2. In the **Columns** section, double-click **insert a new row**.
3. Complete the **Dictionary Entries** embedded list with the following values:

Column Label	Value	Reference	Display
Name	String		True
Event type	Choice		False
Location	Reference	Location [cmn_location]	False
Sponsor	Reference	Company [core_company]	False
Start date	Date		False
End date	Date		False
Budget	Currency		False

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Setting **Display** to true for **Name** causes ServiceNow to display the user-friendly value for the event name rather than displaying a unique system generated ID whenever another record references a Marketing Event.

4. Click **Update**. You have created a first table with seven custom columns.

Create the Equipment Request Table

Create the Equipment Request table in a similar manner.

1. From the **Tables** section, click **New**.

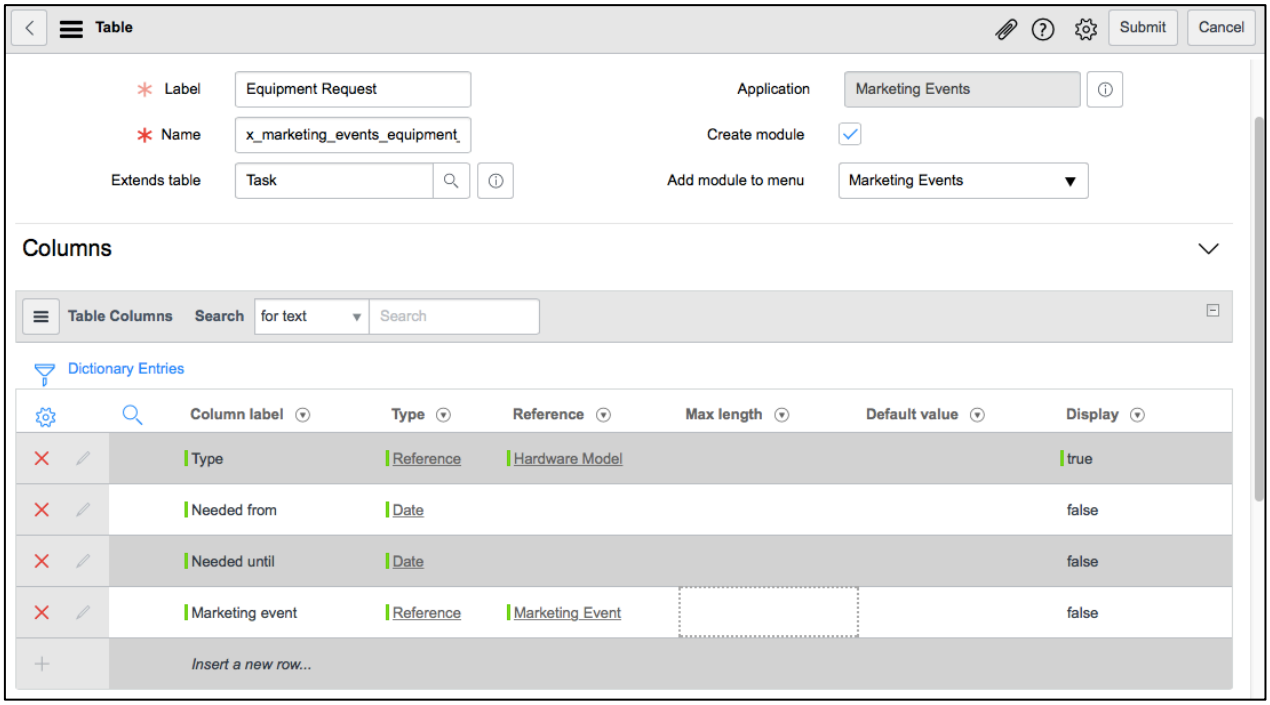
2. In the **Label** field, type **Equipment Request**. ServiceNow automatically fills in the **Name** field based on the label and application name.

3. In **Extends table** field, enter **Task** and select **Task** from the auto-complete drop-down list. Extending an existing table is a powerful facility that allows easy reuse of existing functionality. In this case, Task provides the underlying functionality for an object to participate in a workflow. Since the Equipment table extends task, it can also participate in a workflow without any additional effort. You build the workflow in a later lab.

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4. Fill in the **Dictionary Entries** embedded list with the following values:

Column Label	Type	Reference	Display
Type	Reference	Hardware Model [cmdb_hardware_product_model]	True
Needed from	Date		False
Needed until	Date		False
Marketing event	Reference	Marketing Event [x_marketing_events_event]	False



Note: The **Marketing Event** field is a **Reference** type field to the **Marketing Event** table. A reference field creates a relationship between two tables. In this case, a particular piece of equipment is related to a particular marketing event. It allows you to display information from another table and is like a foreign key in a relational database.

5. Click **Submit**. Now there are two tables in the application.

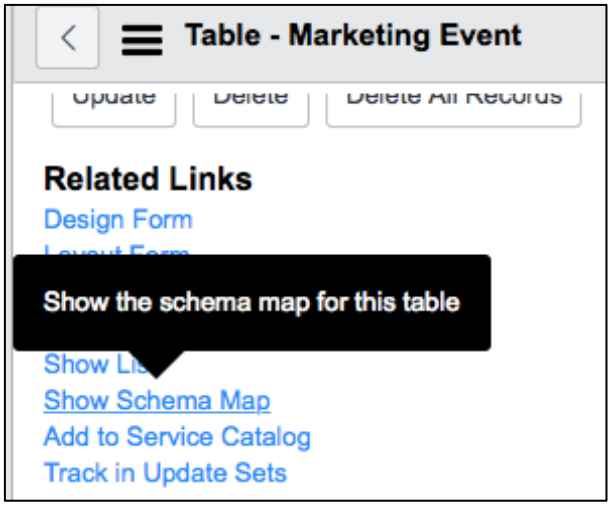
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Verify Results

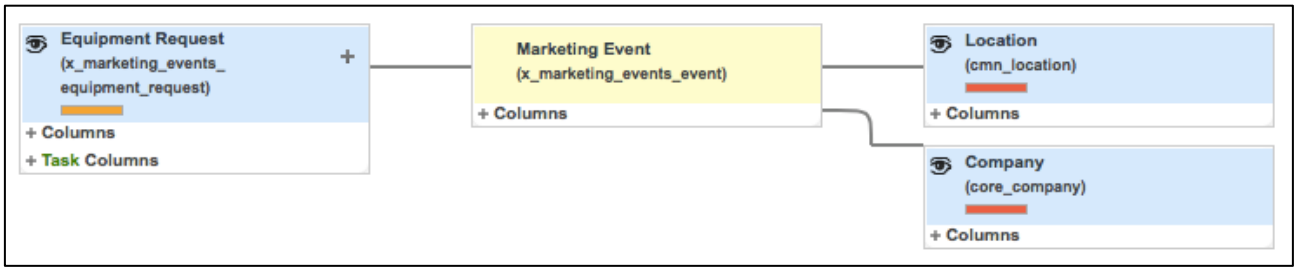
Get another perspective on data model using the schema map.

1. From the **Tables** section, open the **Marketing Event** table.

2. In the Related Links, click Show **Schema Map**.



This shows the schema map (Entity Relationship diagram) for the application.



If you do not see the relationship as depicted above, it means that the reference field between the two tables is not properly set. Go back to step 4 in the previous section.

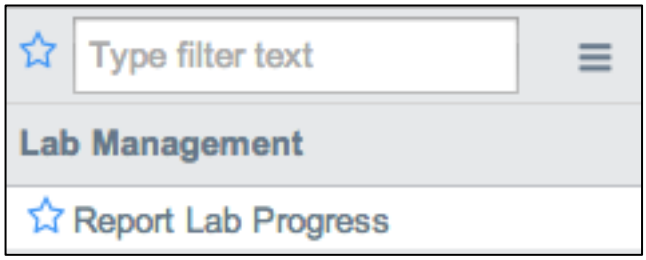
Use the schema map to drill down and look at the application's tables and fields. Notice that there are a few standard system fields added such as Sys ID and Updated. For the Equipment Request table, note the fields included from extending the Task table. The application now has two tables. In the next lab, you modify the user interface so that you can enter data into these tables.

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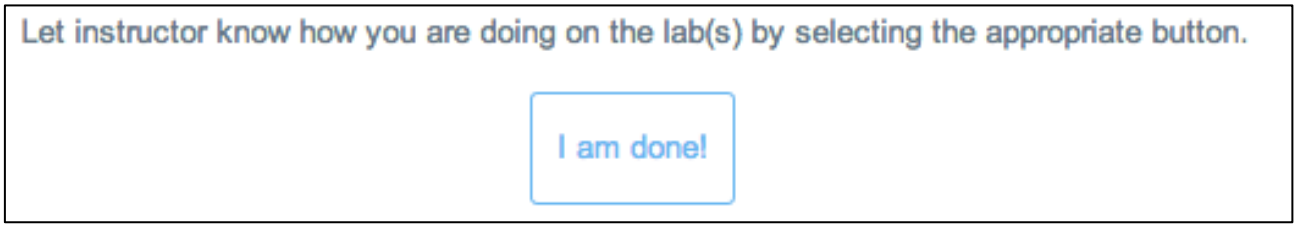
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done**!



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Optimize the User Interface

Lab 3
User Interface

Users need to interact with the application to enter details about a marketing event or to request equipment. Fortunately, ServiceNow automatically generates most of the user interface (UI) features you need. By default, ServiceNow automatically provides a list view of all records in a table and a form to create new records. It also makes these available on mobile devices, which you will cover later. The current task is to customize the automatically generated UI.

This lab explains how to modify the user interface for users to interact with the application.

Related Stories

As a Marketing Event Manager, I need to see a list of events that includes Event Name, Location, Budget, Sponsor, Start Date and End Date so that I can quickly sort and filter the list while working on multiple events.

As a Marketing Event Manager, when I am looking at a list of equipment requests, I need to see Equipment Type, Cost, Needed From, Needed Until, and Event so that I can quickly determine what equipment is needed, when, and where because sometimes there is a long lead time to get the equipment.

As a Marketing Event Manager, I do not want to see all the models of all the hardware that we have in inventory. I only want to see the equipment that we use for marketing events so that entering a equipment request is quicker.

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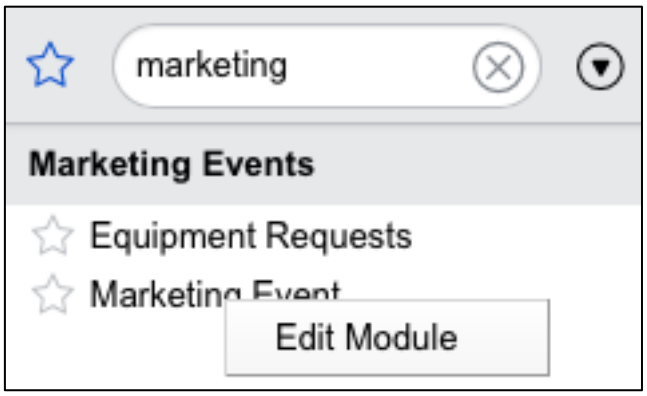
Modify the Marketing Event Menu Item

In this section, you change the label for the Marketing Event menu item.

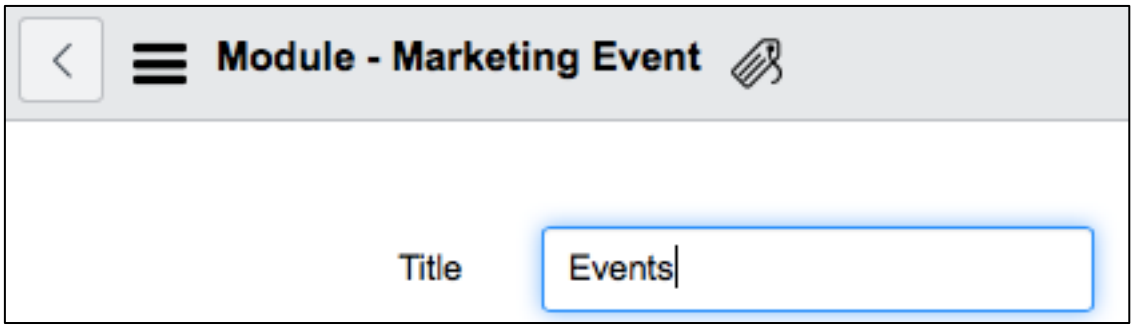
1. Navigate to the **Marketing Events** application by typing **Marketing** in the filter box above the application navigator.

2. Right-click in the white space next to the **Marketing Event** menu item and select **Edit Module**.

   You can also get to the module by editing the module's parent. In this case, you could have right-clicked on the Marketing Events and selected Edit Application Menu. The application's modules are listed in the modules section of the menu.



3. In the **Module – Marketing Event** form, change the **Title** to **Events**.



4. Click **Update**. The application navigator refreshes to reflect the change in the module definition.

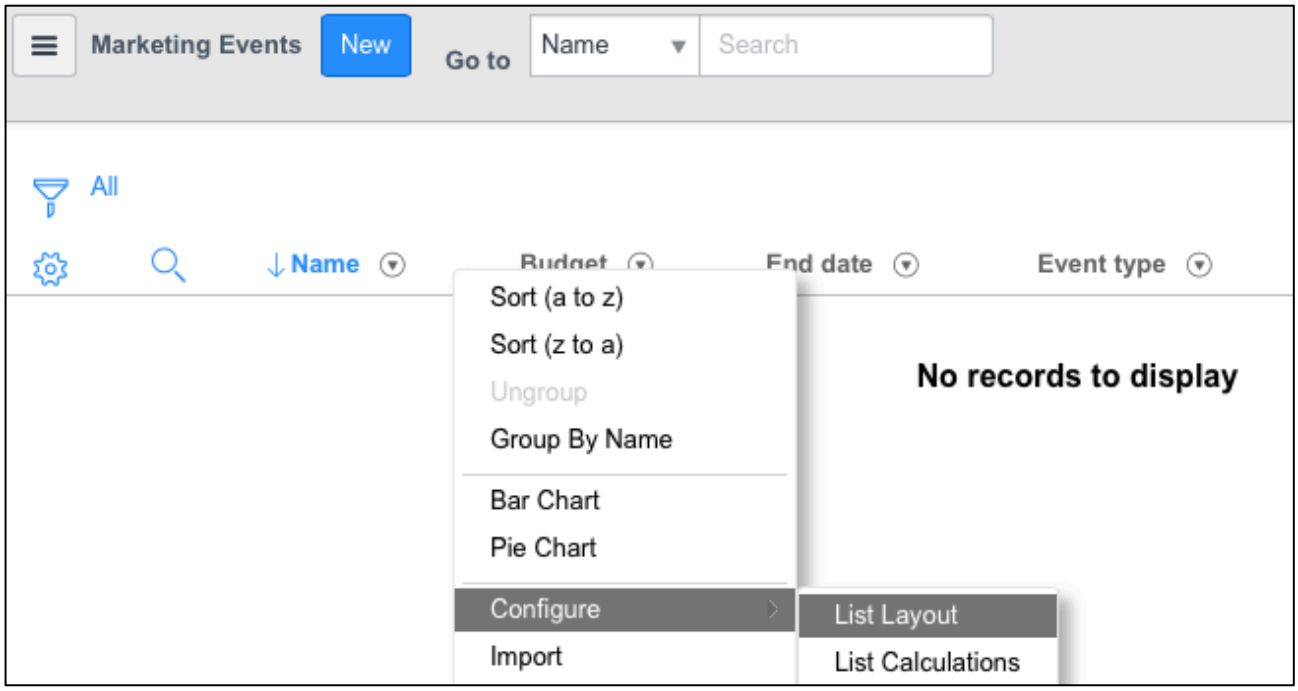
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Modify the Marketing Event List Layout

In this section, you change how the list columns are presented to users looking at marketing events.

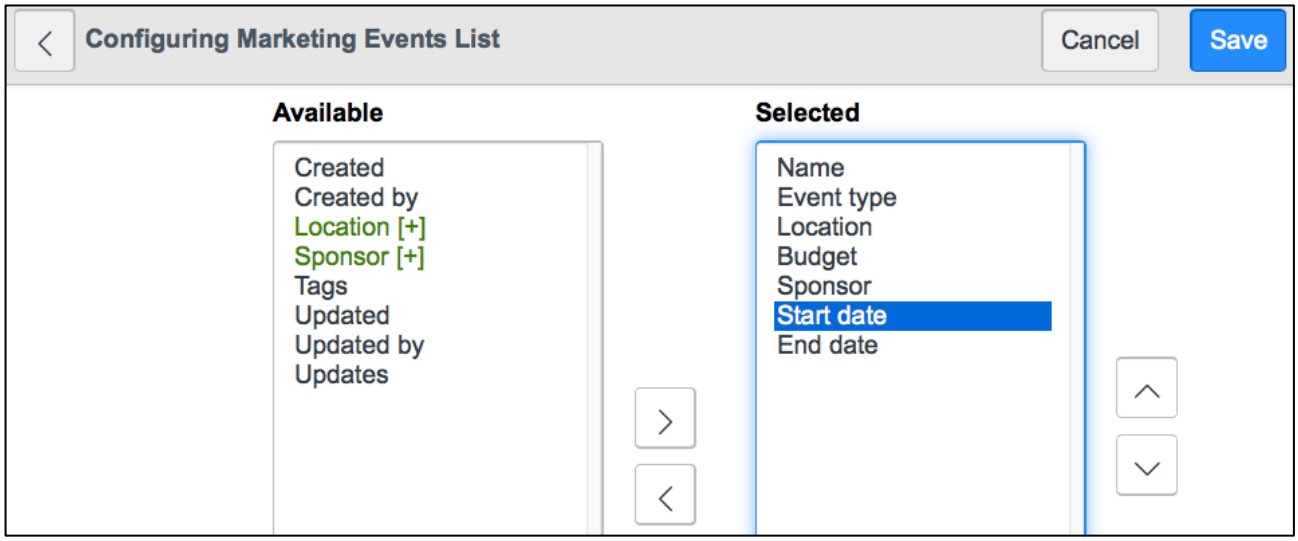
1. Navigate to **Marketing Events > Events.** This shows a list view of all records in the Marketing Event table. Since you have not created any records the list is empty.

2. You can configure the list to make the columns appear in a different order. Right-click the column headers and select **Configure > List Layout**.



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3. Arrange the column headers by selecting a column and clicking the **Up** or **Down** arrow. Arrange the column headers in the following order: **Name, Event Type, Location**, **Budget**, **Sponsor**, **Start Date**, and **End Date**.



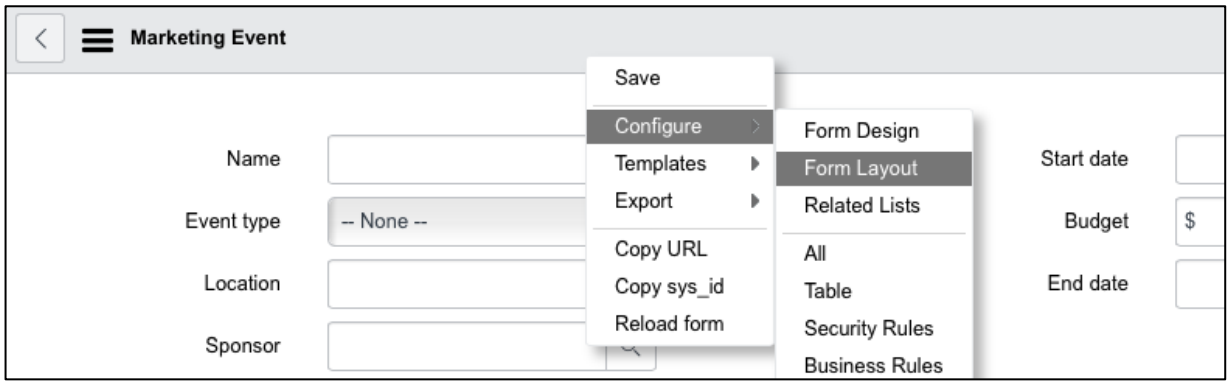
4. Click **Save**. The list uses the new order of column headings.

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Modify the Marketing Event Form

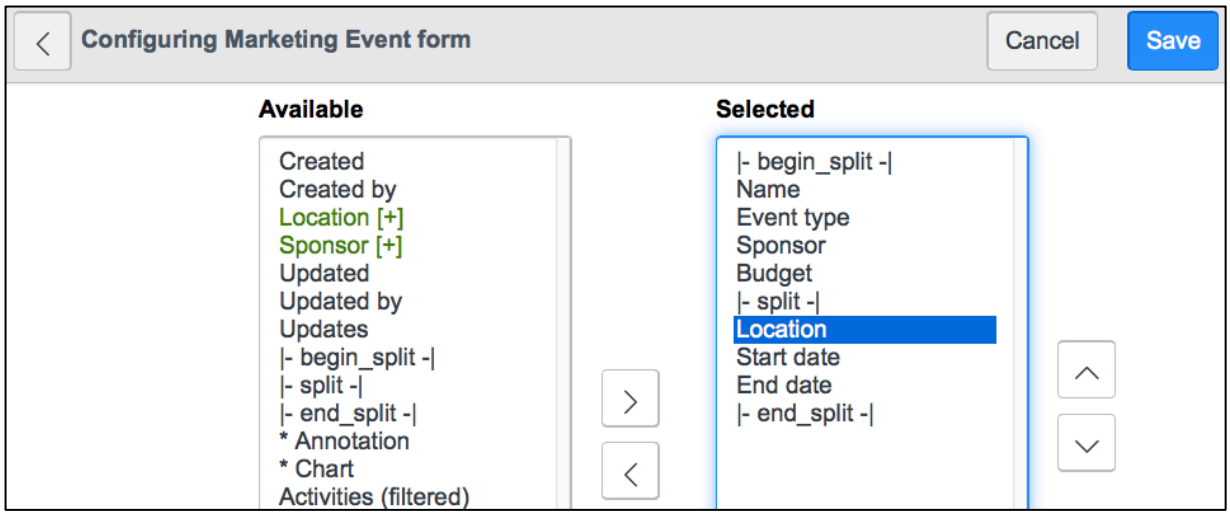
Now that the list is formatted better, turn your attention to the form layout.

1. In the **Marketing Events** list, click **New**.
2. Configure this form to improve the form's workflow. Right-click the gray header bar and select **Configure > Form Layout**.



Later parts of this lab explain the Form Designer, which provides a graphical drag-and-drop experience to customize forms.

3. Configure the form as follows: **|- begin_split -|, Name, Event type, Sponsor, Budget, |- split -|, Location, Start date, End date, |- end_split -|**.

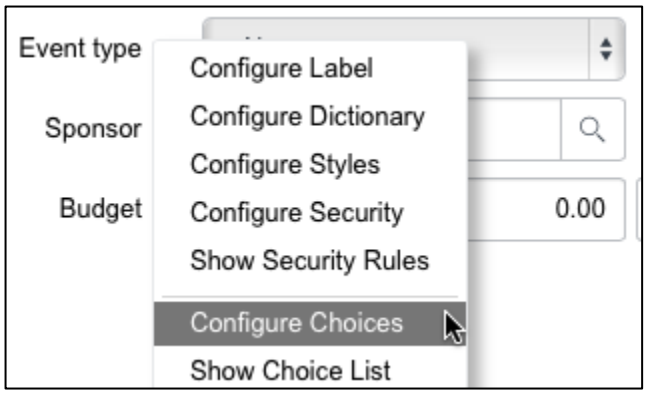


Note: Explore the splits to see how they change the layout.

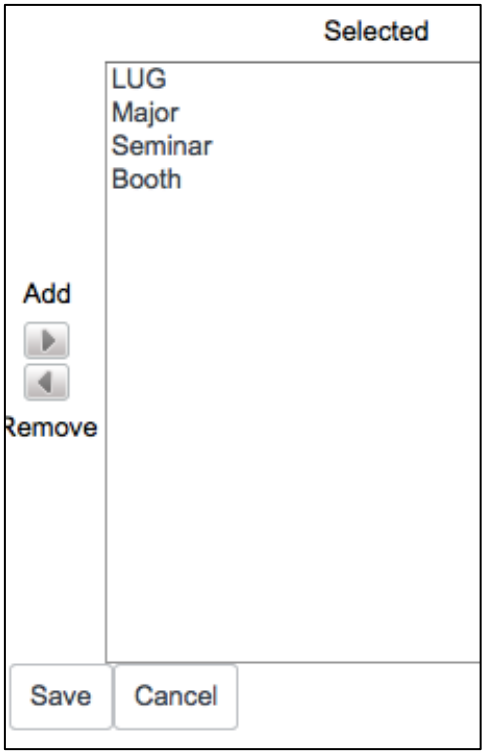
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4. Click **Save** when done.

5. In the **Marketing Event** form, notice how the **Event type** field is a drop-down field containing no values. Remember that you made this into a **Choice** field. Provide the choice values by right-clicking on the **Event type label** and selecting **Configure Choices**.



6. In the **Enter new item** field, enter an event type name and click **Add**. Add the following values for event types: **LUG, Major, Seminar,** and **Booth**.



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7. Click **Save**. To see the values you entered, click the drop-down list next to **Event type**. Users can only pick one of the provided choice values.

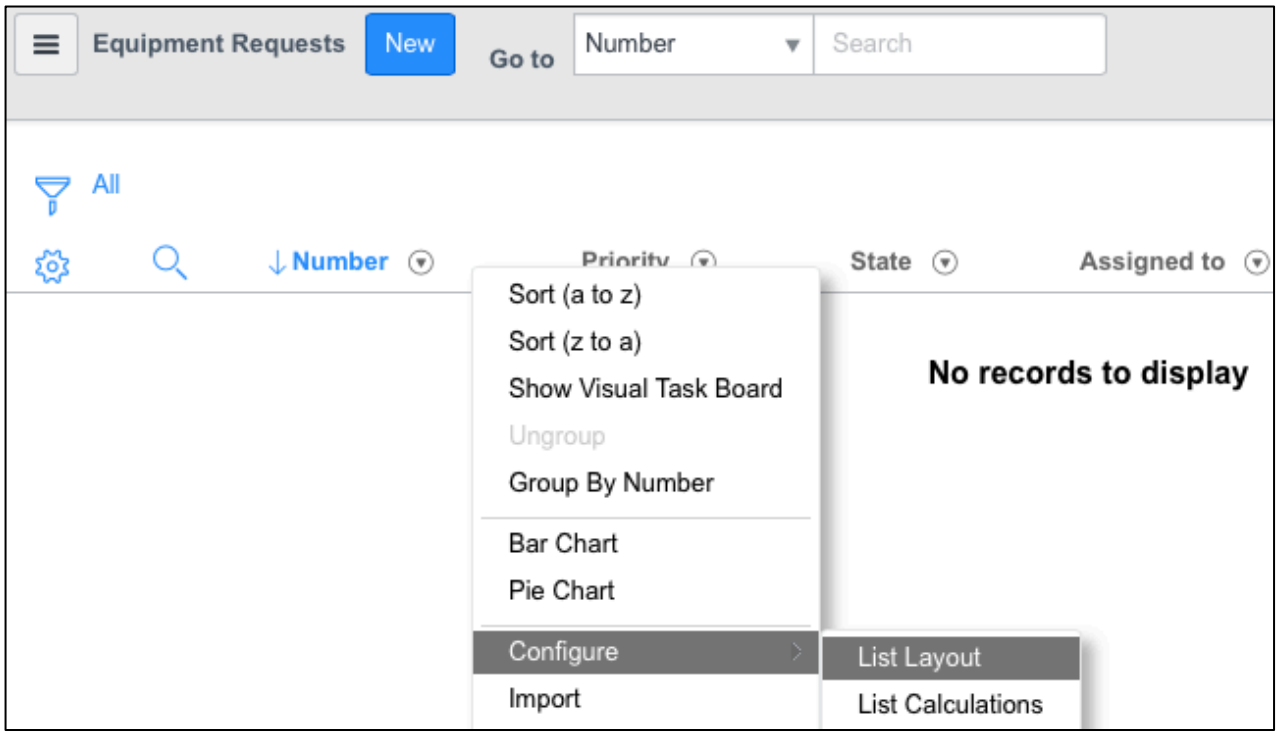
   Note: Providing users with a choice list prevents data entry errors and typos that a free-form text field allows. A fixed list also prevents users from creating multiple variations of the same value.

Modify the Equipment Request List Layout

Now customize the Equipment Request list and form views following a similar process.

1. Navigate to **Marketing Events > Equipment Requests.**

2. Right-click on the column headers and select **Configure > List Layout**. The list configuration form appears.



   Since the Equipment Request table extends from the Task table, you will see a lot of fields in the available fields list and some fields from the Task table in the **Selected** list.

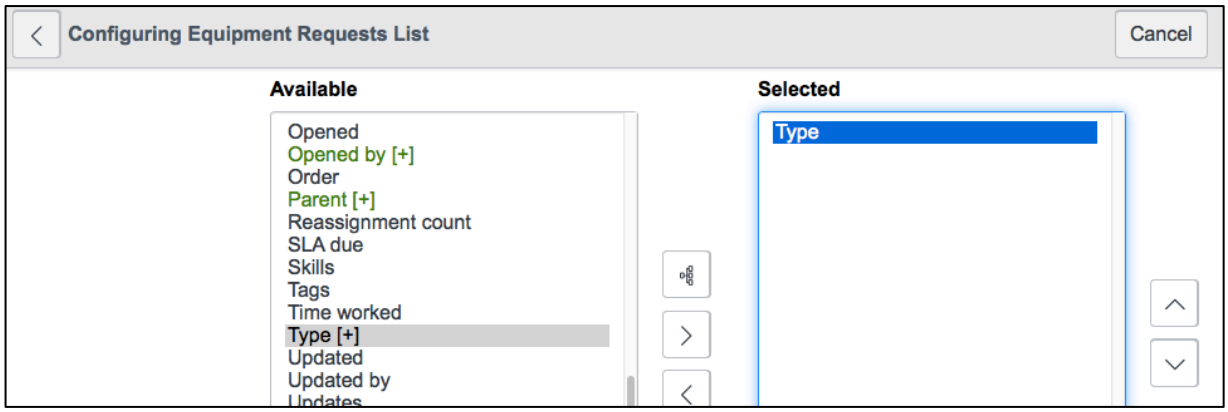
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3. Remove all the default fields in the **Selected** list by double-clicking on the field names.

   Alternatively, hold down the **SHIFT** key and select all these fields and then press the **<** (remove) button.

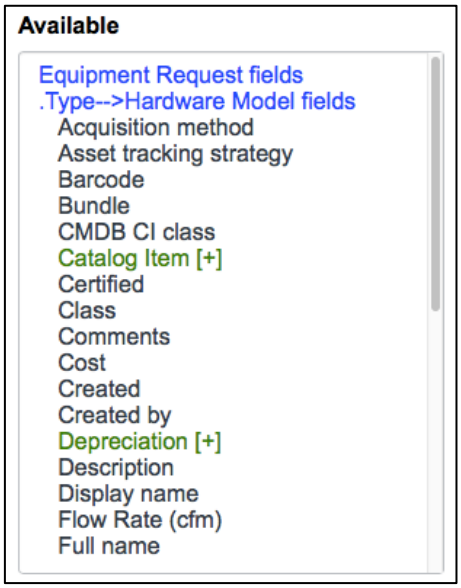
   Note: You can safely remove fields from a list or form view. Removing fields with configuration does not change the actual table structure.

4. In the **Available** list, double-click on the **Type** field to add them to the Selected list.



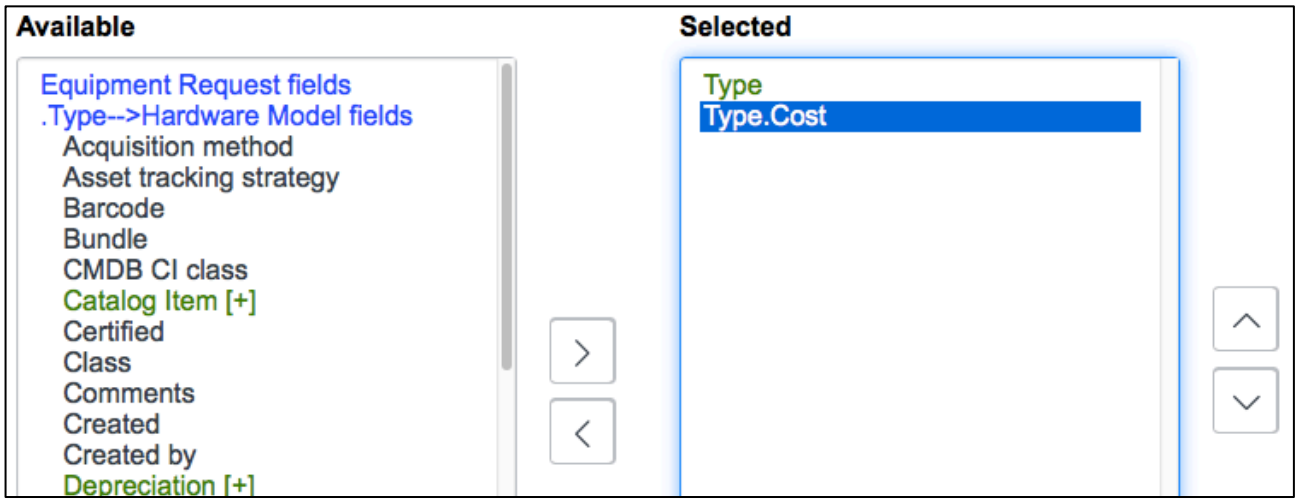
5. Display in the Equipment List a field from the related Hardware Model table. To see fields from this related table, select the **Type** field from the **Available** fields list. ServiceNow displays tables in green text with a [+] next to the table name.

   Click on  to show a list of the fields in the related table.

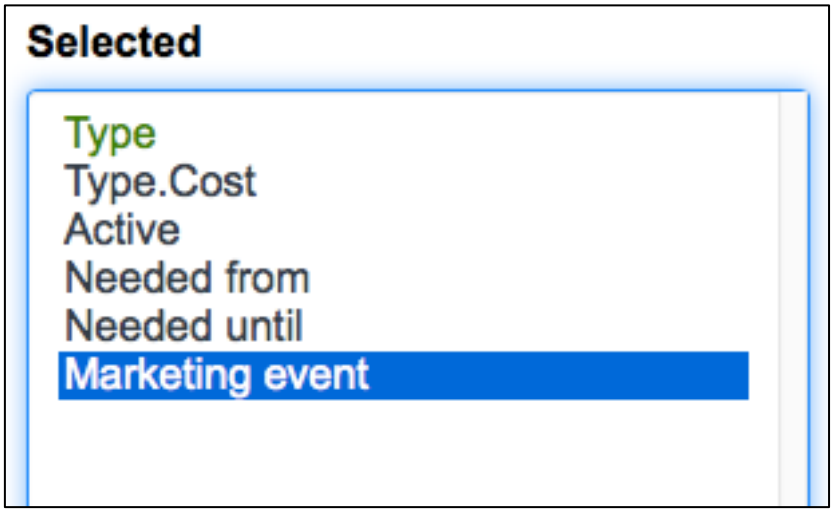


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6. Double-click the **Cost** field to add it to the Selected list.



7. In the **Available** list, click **Equipment Request fields** to return to the fields directly on the Equipment Request table.
8. Add and order the **Needed from**, **Needed until**, and **Marketing event**.



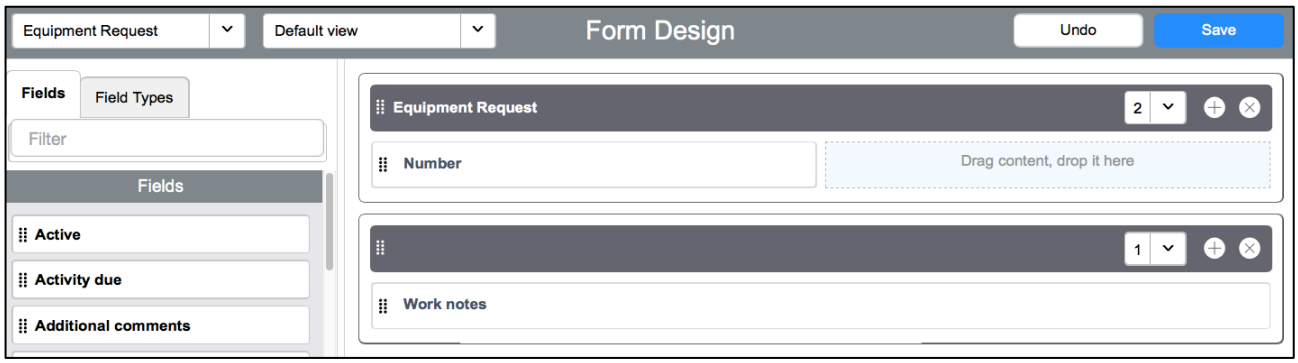
9. Click **Save**.

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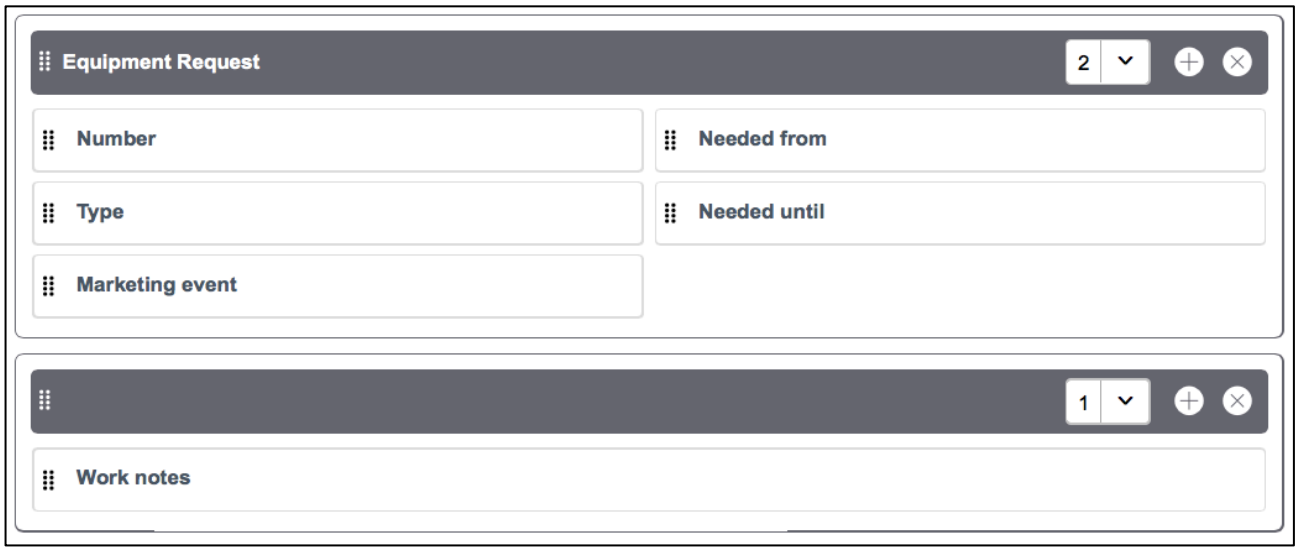
Modify the Equipment Request Form

Now configure the Equipment Request form. Use an alternate method—the Form Designer.

1. Click **New** to view the **Equipment Request** form.
2. Right-click the gray header bar and select **Configure > Form Design**. A new browser tab will open with the Form Designer. Form Designer is an alternate way to Form Layout.
3. Remove all the default fields in the form except **Number** and **Work notes** by selecting each field and then clicking the **X**.



4. Configure the form as follows by dragging the field from **Fields** list on the left and dropping them on the **Equipment Request** form, as specified below.



5. Click **Save**.

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6. Close the browser tab to go back to the **Equipment Request** form.

7. Right-click the gray header bar and select **Configure > Reload form** to see the updates to the form.

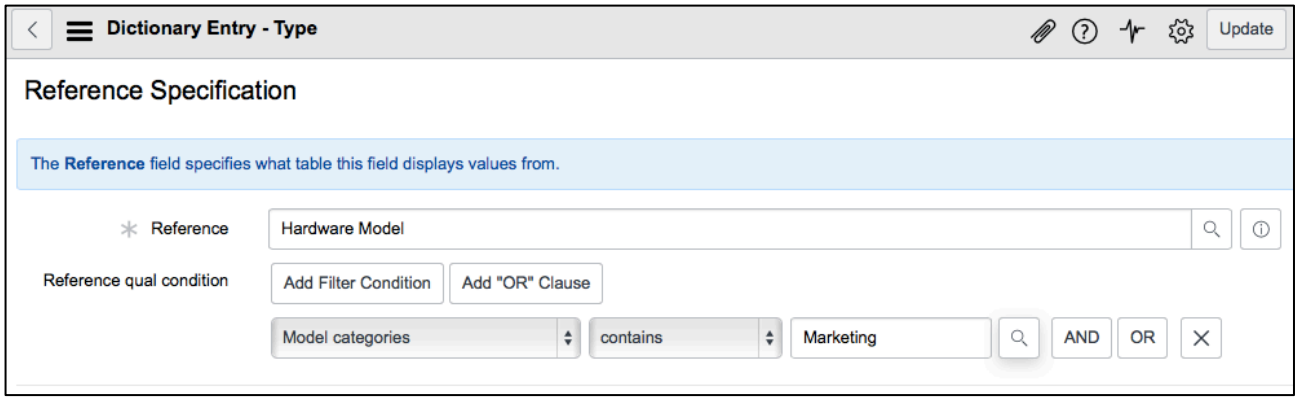
Create a Reference Qualifier

The form looks good. You can optimize the user experience even more by making reference lists more relevant. This reference list filtering can be done with a reference qualifier.

1. Next to the **Type** field, click . Note that over 80 different hardware models are available. Close the pop up window.

2. Right-click on the **Type field label** and select **Configure Dictionary**.

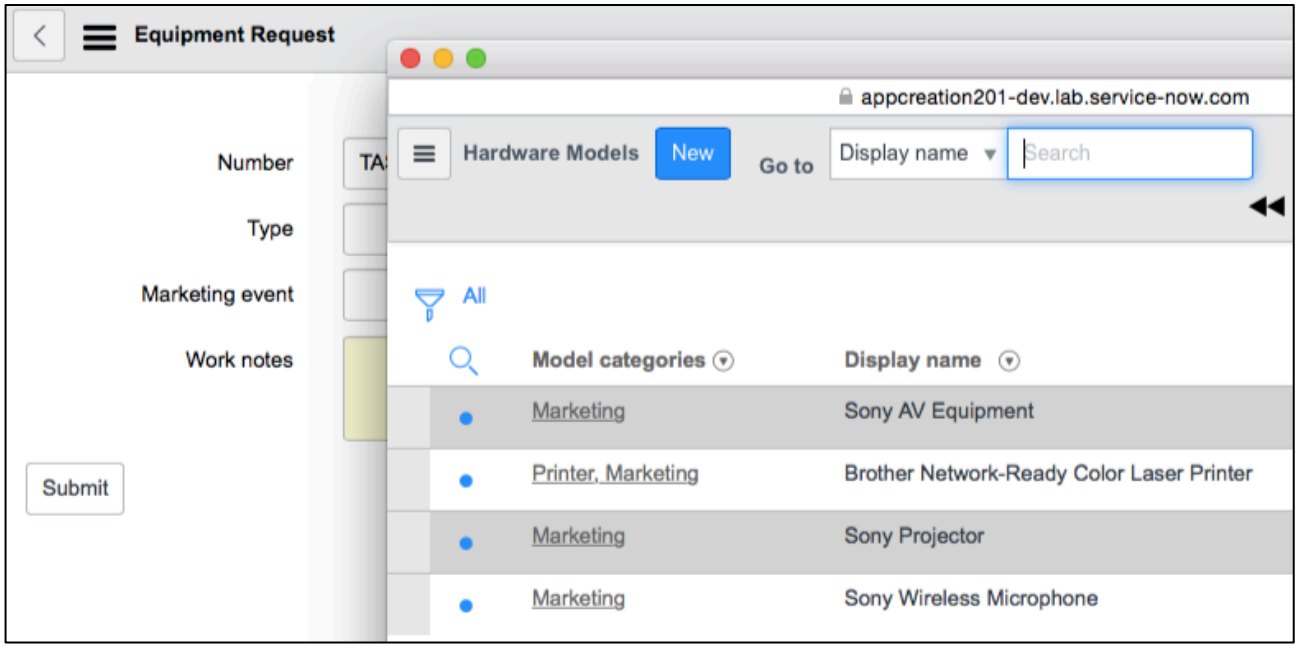
3. In the **Reference Specification** section, in the **Reference qual condition** field, set the filter condition to **Model categories contains Marketing** as shown below.



4. Click **Update**.

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5. Next to the **Type** field, click . Note now only four hardware models are available. Close the pop up window.



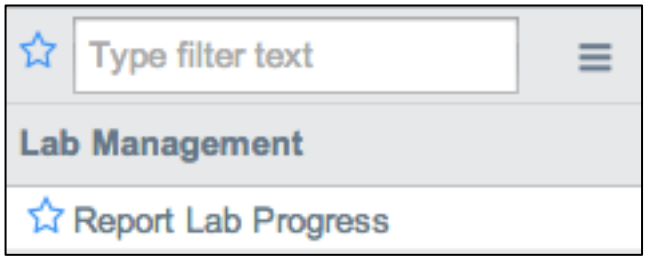
Now the application has two tables, forms to add new records, and lists to view all records. In the next lab, take your application for a spin!

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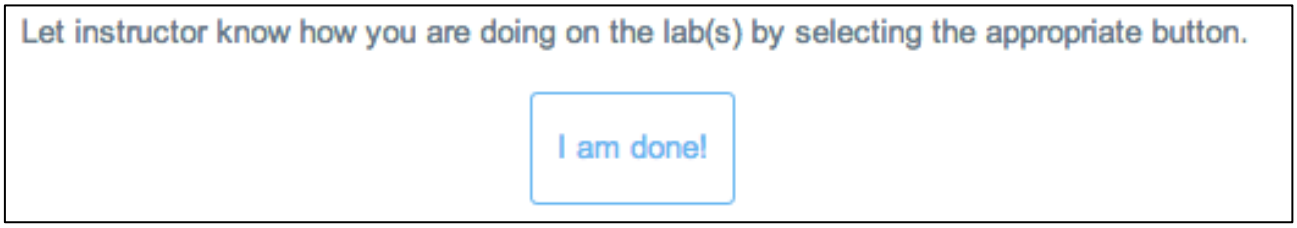
Progress Report

Let the instructor know you are done.

1. Navigate to Lab Management> Report Lab Progress.



2. Click I am done!



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Test Drive the Application

Lab 4
Test Drive

This lab explains how to verify what you have done in the previous labs.

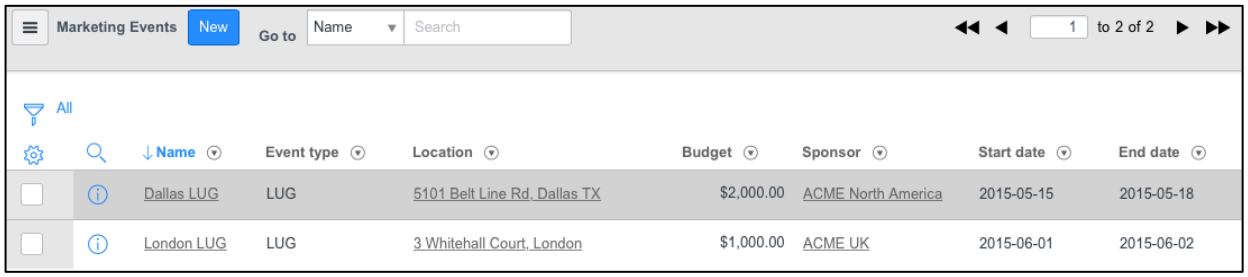
Related Story
As a Marketing Event Manager, when I am looking at a Marketing Event, I need to see the equipment requests related to that event so that I can make sure all of the requests for that event have been processed in a timely manner.

Enter Marketing Events

It is time to start enjoying the fruits of your labor. Add a few marketing event records.

1. Navigate to **Marketing Events > Events**.
2. Create marketing event records using the following information.

Name	Type	Sponsor	Budget	Location	Start date	End date
Dallas LUG	LUG	ACME North America	$2000.00	5101 Belt Line Rd, Dallas	2015-05-15	2015-05-18
London LUG	LUG	ACME UK	$1000.00	3 Whitehall Court, London	2015-06-01	2015-06-02



Now add some corresponding equipment request records.

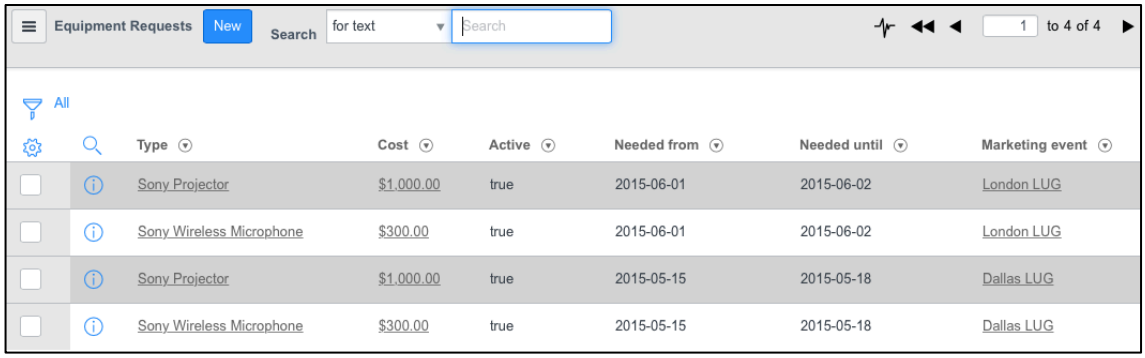
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Enter Equipment Requests

1. Navigate to **Marketing Events > Equipment Requests.**

2. Create equipment request records using the following information.

Type	Marketing Event	Needed from	Needed Until
Sony Projector	London LUG	2015-06-01	2015-06-02
Sony Wireless Microphone	London LUG	2015-06-01	2015-06-02
Sony Projector	Dallas LUG	2015-05-15	2015-05-18
Sony Wireless Microphone	Dallas LUG	2015-05-15	2015-05-18



Note: You can sort by the column headings in the list view as well as edit any field by double clicking. Give it a try.

Add a Related List

Make one small enhancement to the application. When you look at a particular marketing event, you want to be able to see the equipment requested for that event on the same page. Since the Equipment Request table is related to Marketing Event table, you can do this easily.

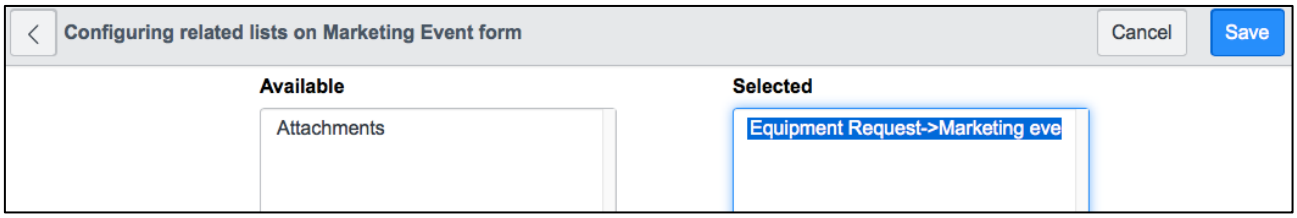
1. Navigate to **Marketing Events > Events**.

2. Open the **London LUG**.

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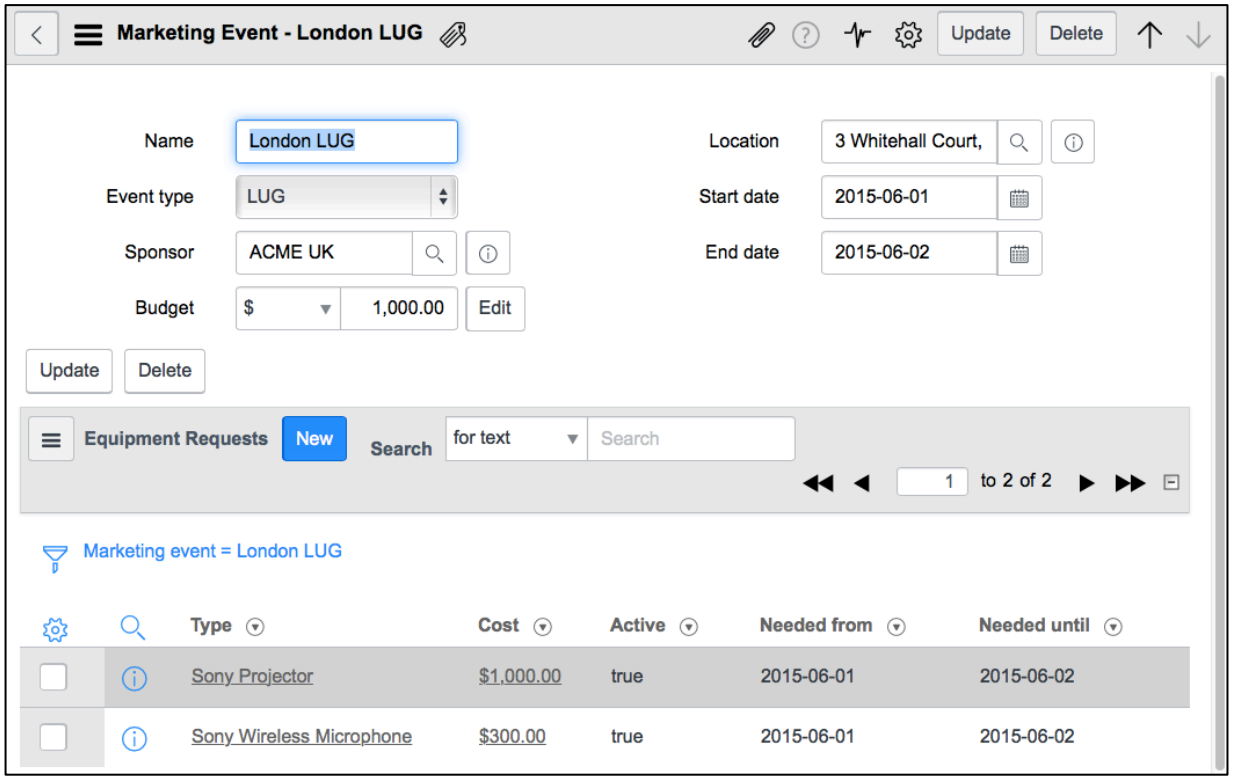
3. Right-click on the gray header bar and select **Configure >Related Lists**.

4. From the **Available** list, select **Equipment Request->Marketing event** and click .



Note: Also add the Attachments related list as desired. The platform has built-in functionality that allows you to add a file, document, or image to any record.

5. Click **Save**. Notice that the related equipment requests for the event now show up in the same view.

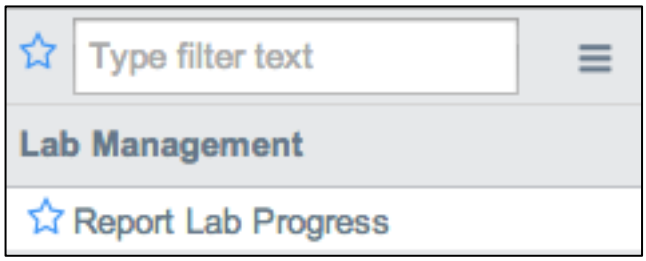


You now have a functioning application hosted securely in the cloud. This is already a huge improvement over ad-hoc spreadsheet sharing. But you are not done with the application yet.

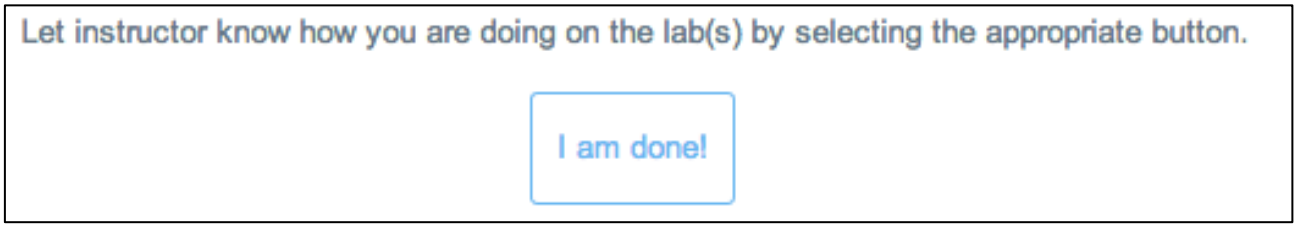
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Progress Report

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



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Extend the Data Model

Lab 5
Data Model Extension

The new event management application has become popular with users, and now they want to do even more: track event attendees. They are excited about the potential to keep in touch with the attendees and run reports across events. You do two tasks in this lab:

- Create a new attendee table and link it to the marketing event table
- Create two new fields in the marketing event table:
  - Expected number of attendees
  - Actual registration

The process of creating a new table is the same as that outlined in **Create the Database Tables** lab.

Related Stories
As a Marketing Event Manager, I need to track information about event so that the company can do a better job following up with the attendees after the conference.

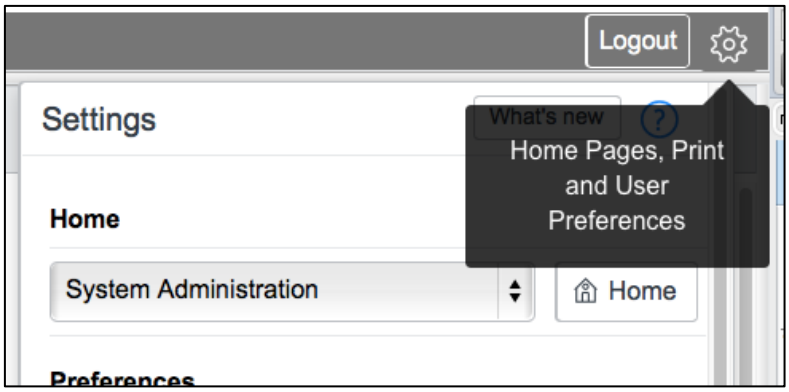
As a Marketing Event Manager, I need to track the number of attendees expected and the number of people registered so that the company can properly staff the event.

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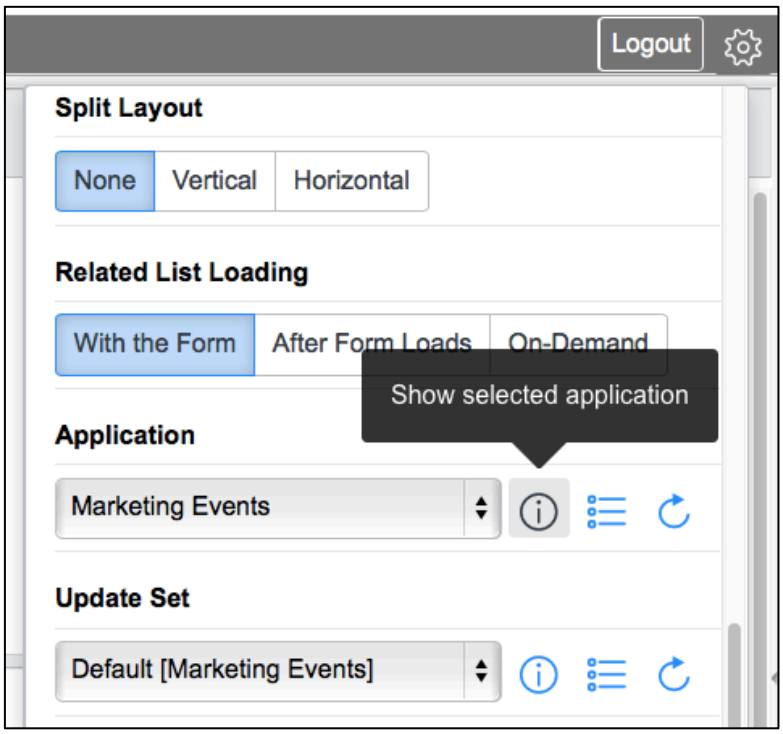
Navigate to the Application

Below is an alternative way to get to the application.

1. Navigate to the application settings for your application by clicking on the **Preferences icon** in the banner area.



2. Next to the application name, click the **Show selected application icon**.

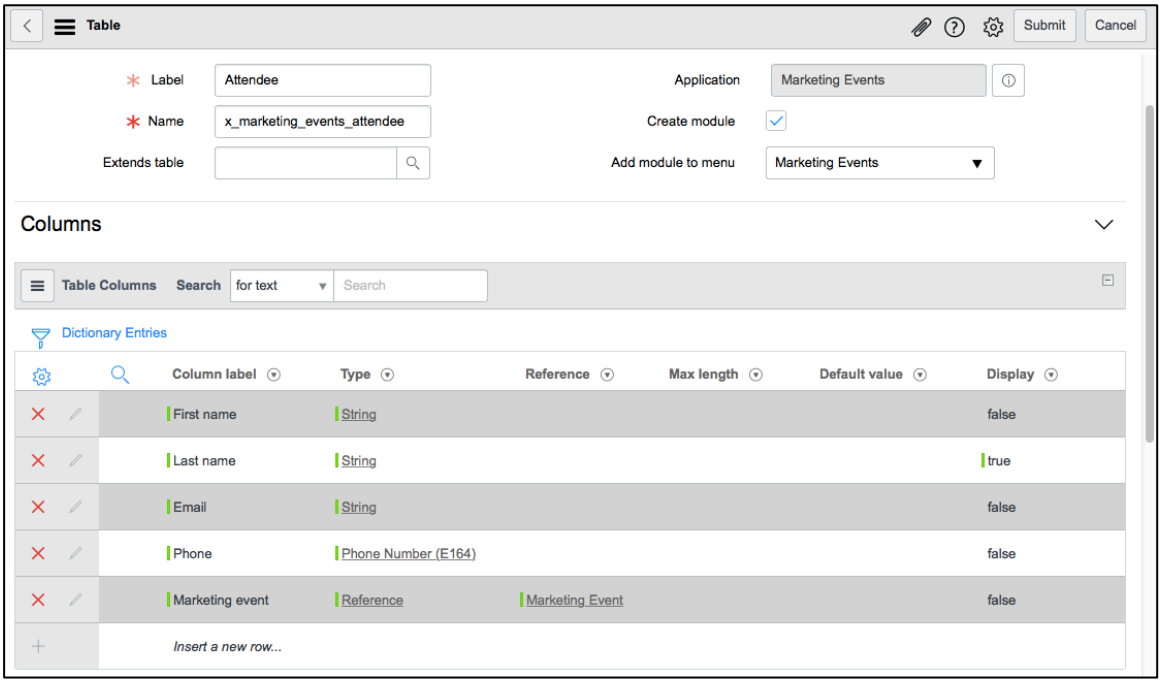


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Create the Attendee Table

1. Create a new table labeled **Attendee** with the following fields.

Column label	Type	Reference	Display
First name	String		False
Last name	String		True
Email	String		False
Phone	Phone Number (E164)		False
Marketing event	Reference	Marketing event [x_marketing_events_event]	False



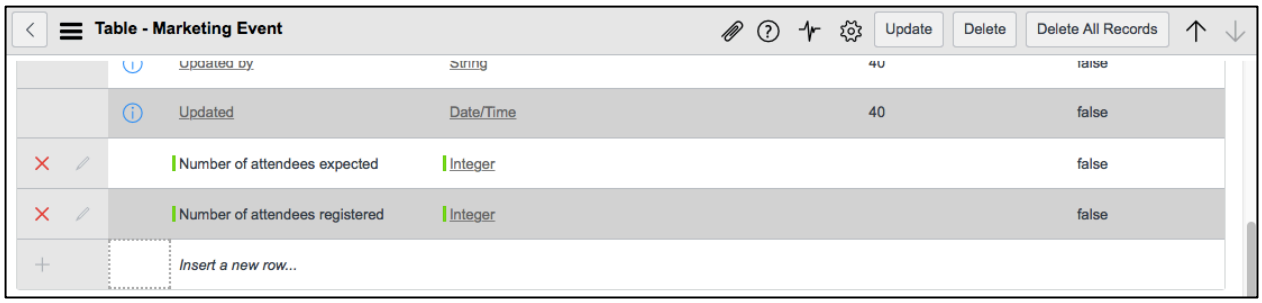
2. Click **Submit**.

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Modify the Marketing Events Table

1. Add these fields to the **Marketing Event** table.

Column label	Type	Display
Number of attendees expected	Integer	False
Number of attendees registered	Integer	False



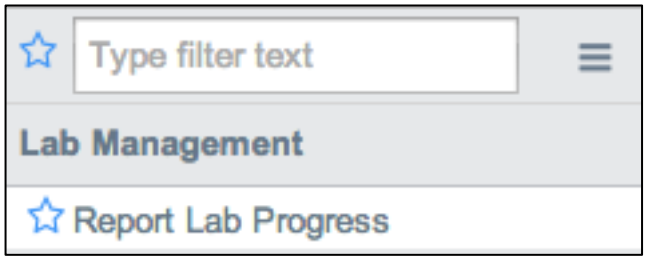
2. Click **Update**.
3. Navigate to **Marketing Events > Attendees**.
4. Add a few attendees.

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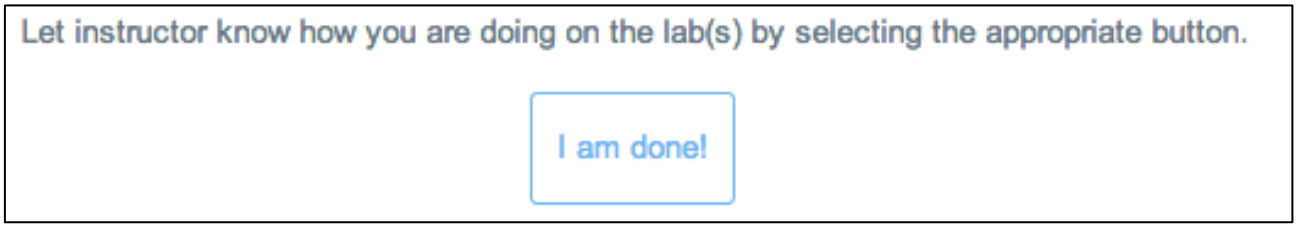
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



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Make Requests Through the Service Catalog

Lab 6
Service Catalog

The application is a big hit with the marketing department. Spurred by that initial success, they want to expand the application to solve other common issues they face. Currently, requests to hold marketing events arrive via emails to sales managers. These requests are often missing key information and are rarely handled consistently.

Marketing would now like requestors to fill out an online form instead of using current inconsistent methods. The marketing department could then receive, review, and track the requests online, and process them more consistently and efficiently.

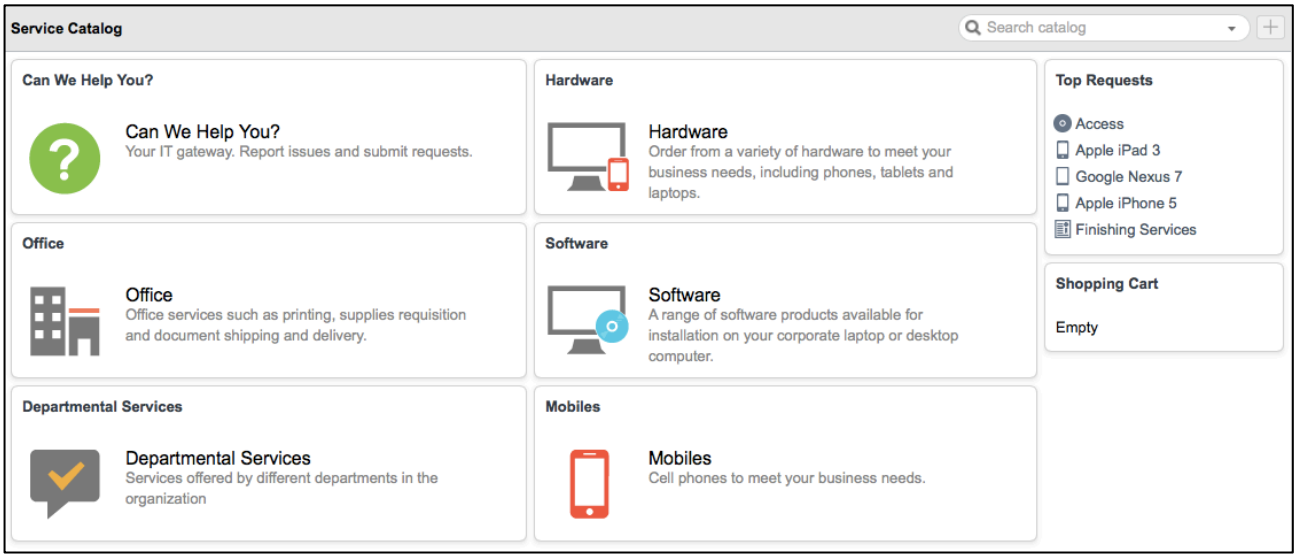
There are two ways to implement these changes:

- Give access to the existing application to the sales managers
- Create a Service Catalog request process

Service Catalog is a term that has its origins in IT Service Management. A Service Catalog is a representation of the Services offered to an organization by a service provider (IT) to their customers (the Business). Using the ServiceNow Service Automation Platform's built-in Service Catalog ensures that users have a single interface for all of their request-based needs without having to navigate multiple applications and interfaces. Multiple, independent catalogs can be managed while still giving requesters a single entry point and interface.

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Here is a sample Service Catalog.



Since the sales managers do not need to understand the nuances of the marketing process, it makes sense for them to make marketing event requests using a service catalog. This lab explains how to create a Service Catalog for marketing event requests.

To implement the request, you create a Record Producer. A Record Producer creates an input form within the service catalog to capture requests and then uses the request data to create a new record in a destination table. For this exercise, you want a Record Producer that creates new records in the Marketing `Event` table when someone uses the Service Catalog to request a new event.

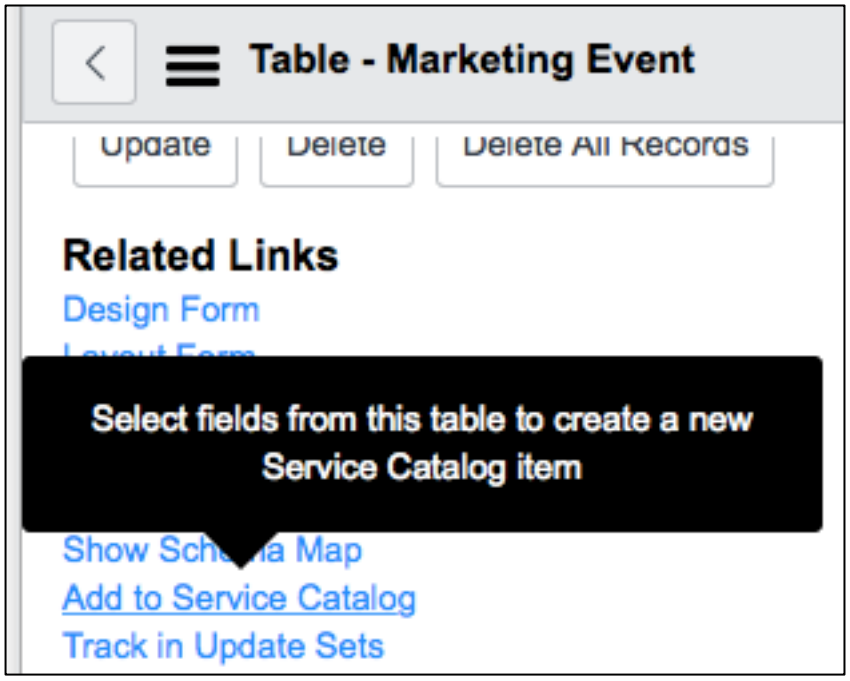
Related Story

As a Marketing Event Manager, I need people to submit requests for marketing events through an online form so that Marketing can track and process them consistently and efficiently.

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Create a Record Producer

1. Navigate to the **Marketing Event table** definition. Hint: Get to it from the application record.
2. In the **Related Links**, click **Add to Service Catalog**.

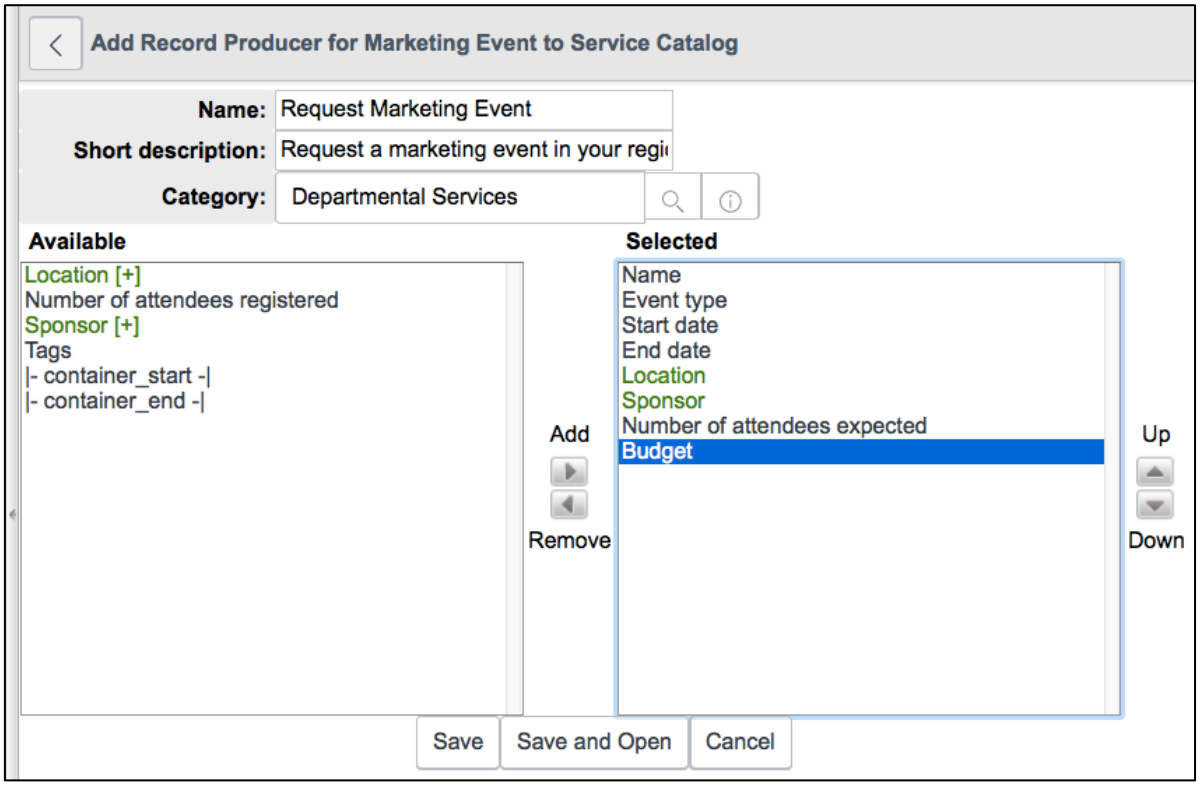


3. Fill in the **Record Producer** form with the following values:

In this field…	Enter…
Name	Request Marketing Event
Short Description	Request a marketing event in your region
Category	Departmental Services

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4. Add fields to the record producer by moving fields from the **Available** side to the **Selected** side in the order they are shown below.



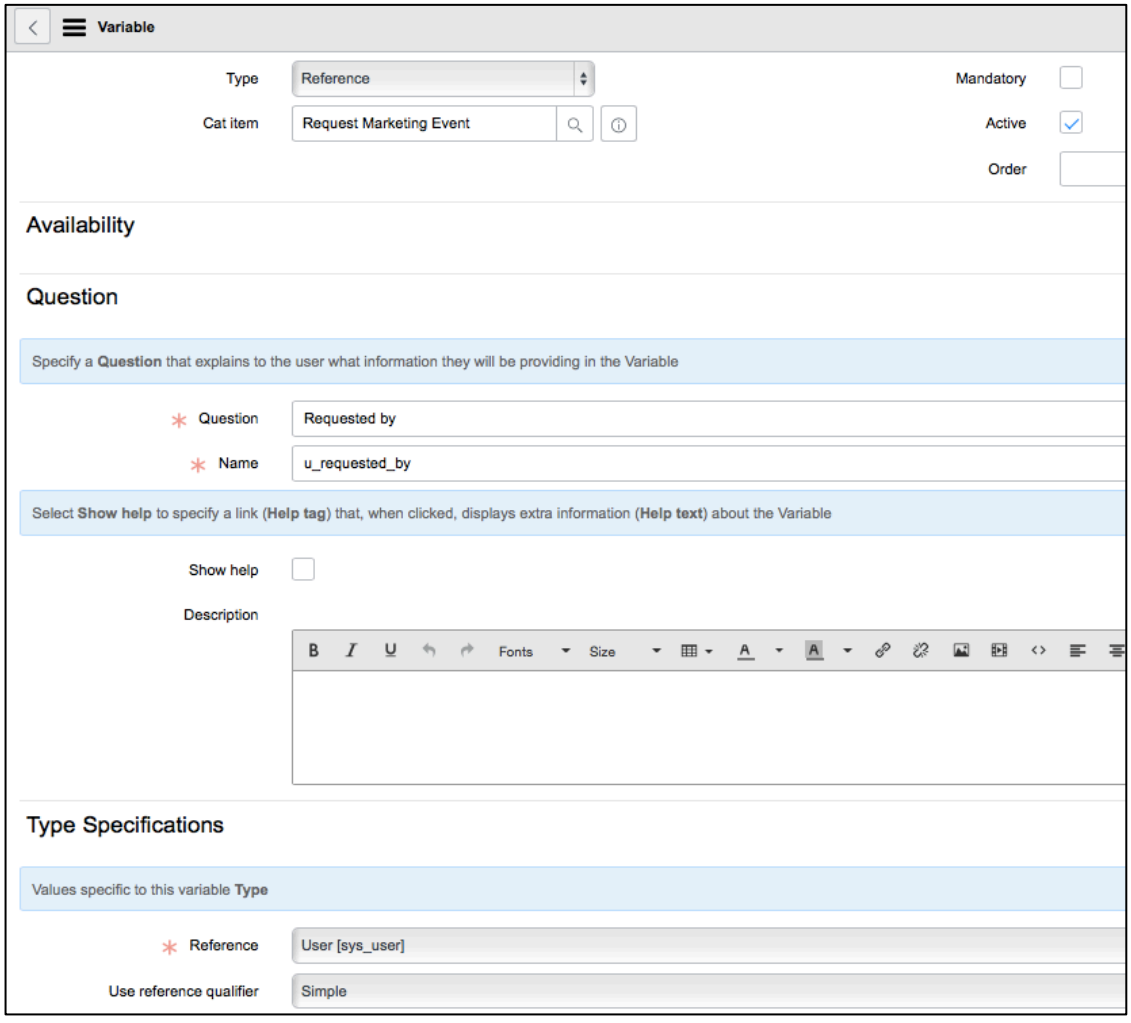
5. Click **Save** and **Open**.

6. Now create a new variable within the Record Producer in order to capture the requesting user. Scroll down to the **Variables** related list in the Record Producer form and click **New**.

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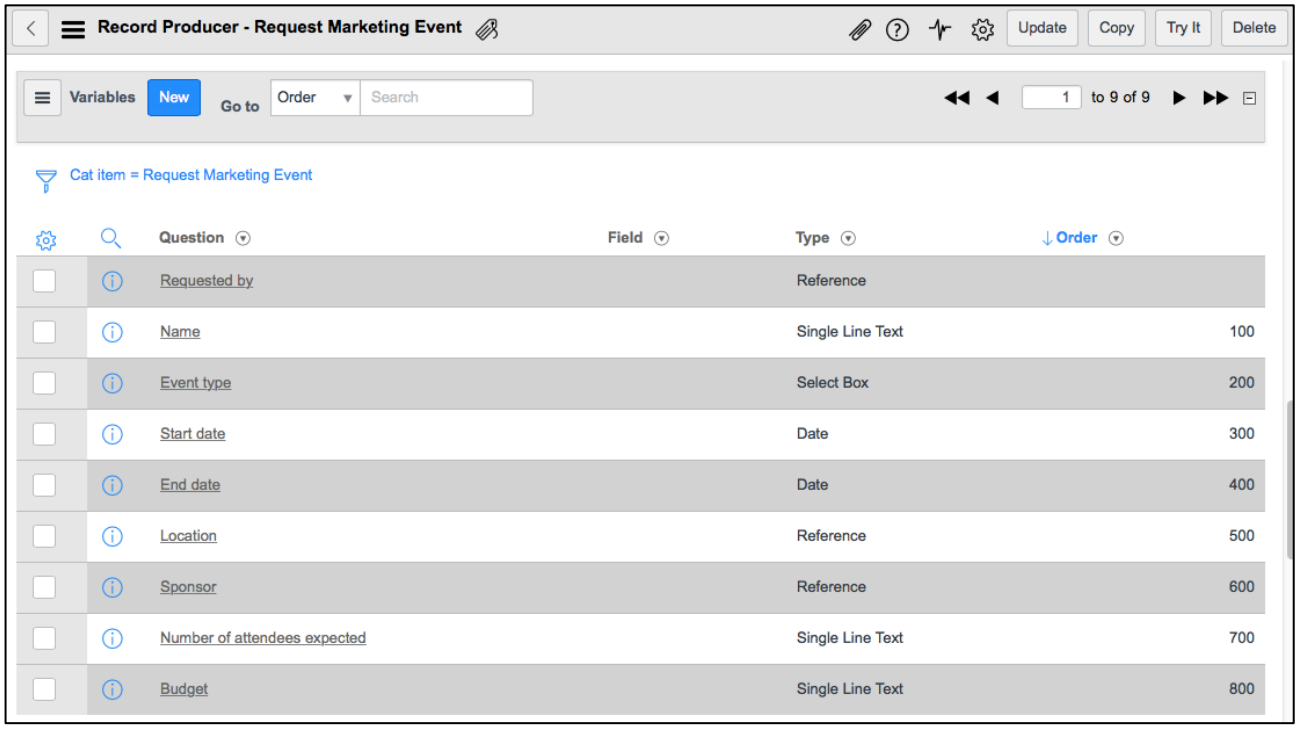
7. In the **Variable** form, enter the following:

In this field…	Enter…
Type	Reference
Question	Requested by
Name	u_requested_by
Reference	User [sys_user]



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8. Click **Submit**. Below is the resulting variable list.



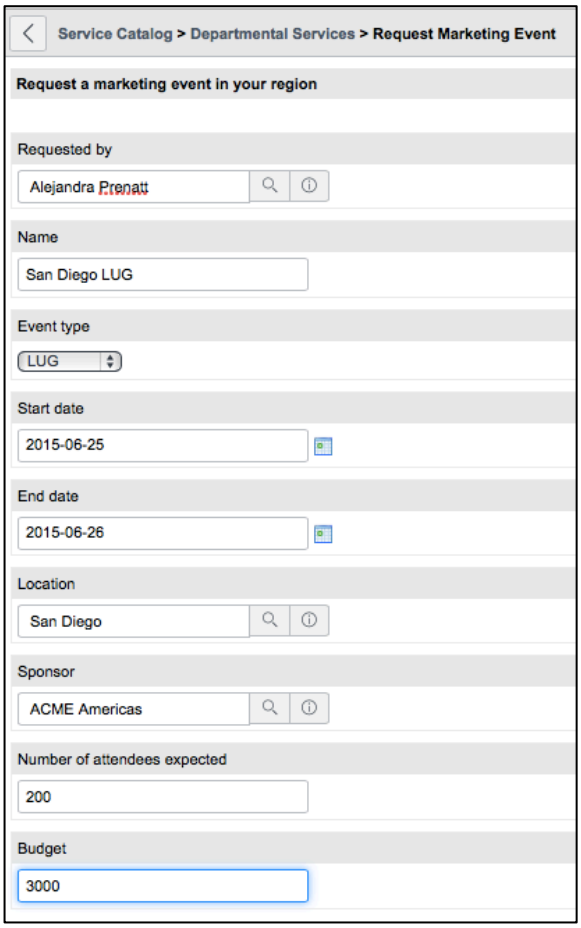
Note: Each variable name matches the field name from the Marketing Event table. Also notice that you use a reference field for the Requested by field. This reference field provides lookup functionality when using the Record Producer.

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Verify Results

Now that you created the variables, the Record Producer displays fields for users to fill out.

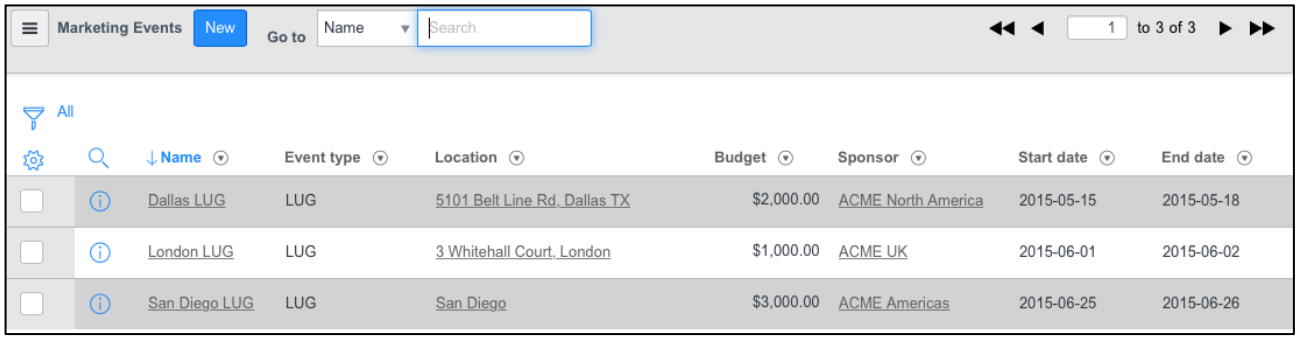
1. Click **Try It**. This provides a preview of record producer.
2. Test it out. Enter some data and click **Submit**. You are redirected to the Service Catalog.
3. Navigate back to **Marketing Events** and open the **Marketing Event record** just created via the record producer.
4. Next try it from the Service Catalog. Navigate to **Self-Service > Service Catalog**.
5. Click on **Departmental Services**.
6. Now select the **Request Marketing Event** service from the catalog. Add an entry as shown.



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7. Click **Submit**.

8. Verify that is has been added by navigating to **Marketing Events > Events**.



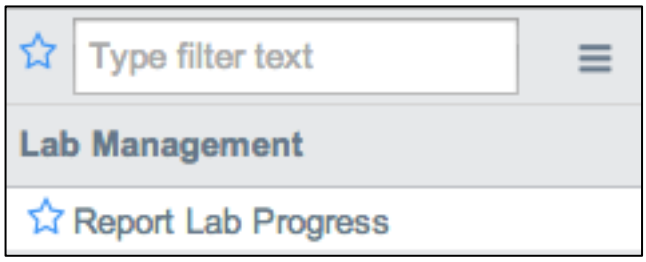
Congratulations! You created a new Service Catalog item for users to submit Marketing Event requests.

In this lab you used Service Catalog to create an easy to use and uniform interface for sales managers to request marketing events. This is a functionality you can use wherever a request fulfillment pattern can be applied and the requestor of the service needs a simple, consistent interface.

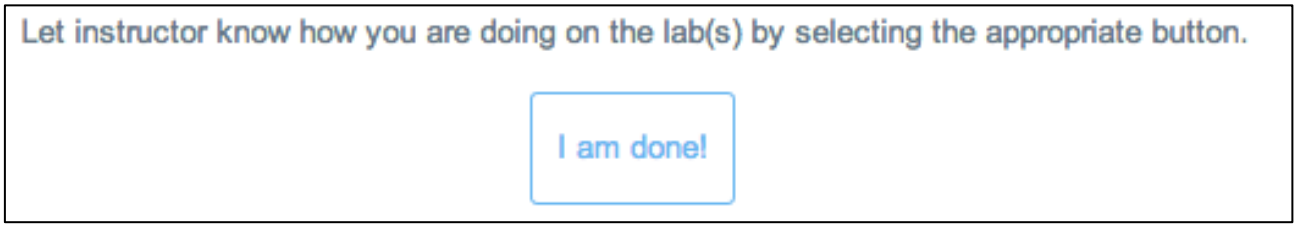
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



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Automate with Workflows and Approvals

Lab 7
Workflow

Too often business processes are implemented by a combination of email, ad-hoc conversations and other inefficient, manual methods. Workflows can automate this, resulting in increased efficiency and reduced errors. Additionally, workflows provide an audit trail—this feature can be critical for an application that has to comply with internal or external regulations.

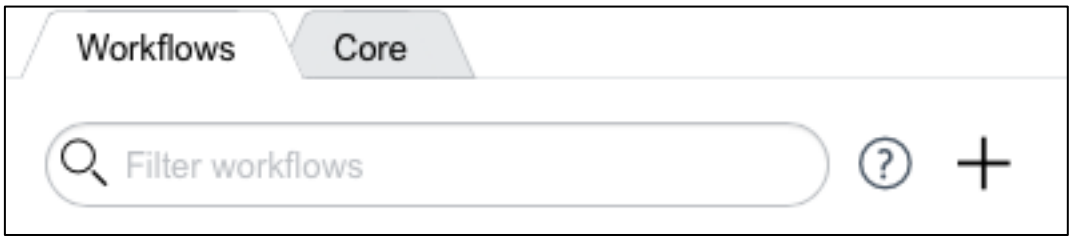
In this sample scenario, a manager and the marketing VP have to approve the request for any equipment that costs over $500. You will build a workflow to automate this process. As soon as a user enters a request for equipment costing over $500, the workflow will get triggered. This is a simple (but common) scenario. The platform workflow capabilities allow complex criteria for triggering approvals and branching logic as well as integration with external systems.

Related Story
As a Marketing VP, I need to approve requests for any equipment that costs over $500 so that I can control my budget and make sure the request is justified.

Start the Workflow

In this section, create the workflow container.

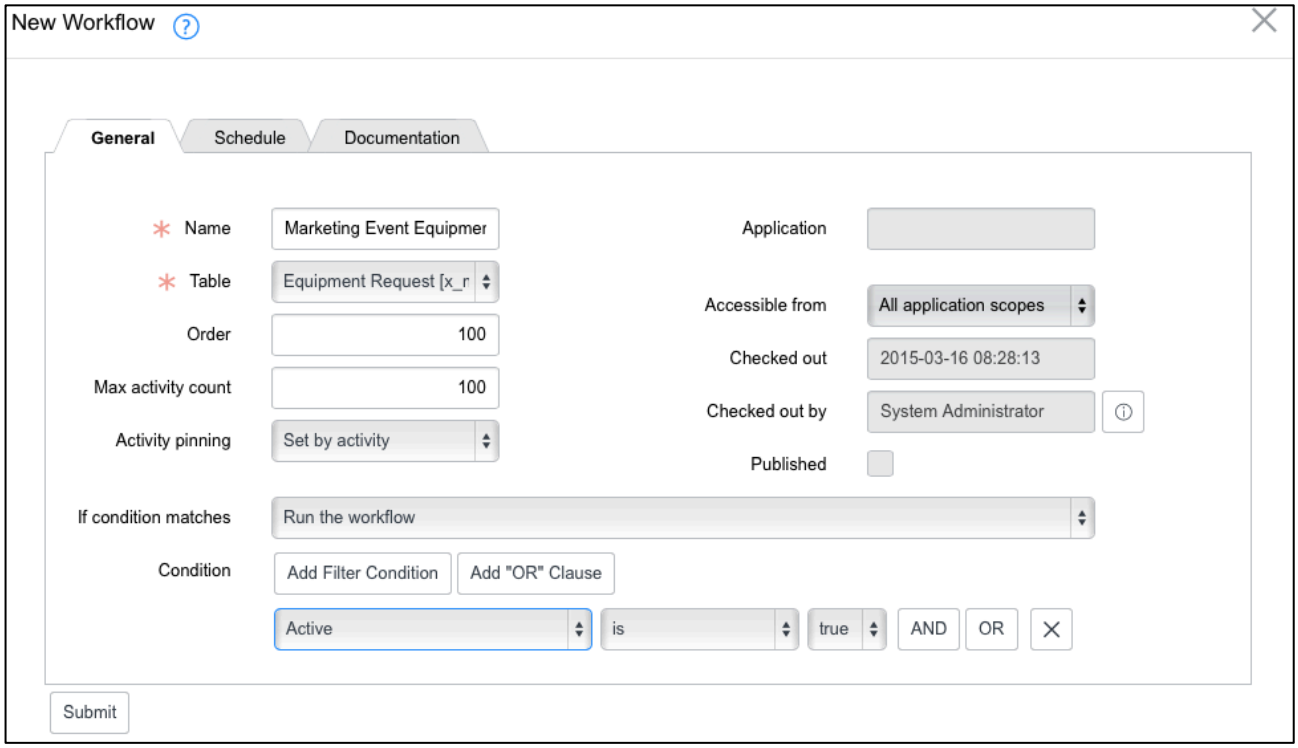
1. Navigate to **Workflow > Workflow Editor**. A new browser tab opens with the workflow editor.
2. In the **Workflows** tab, click + . The **New Workflow** dialog opens.



3. In the Name field, type **Marketing Event Equipment Request**.
4. In the **Table** field, select **Equipment Request [x_marketing_events_equipment_request]**.

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5. You want the workflow to run only for active requests. Set the **Condition** to **Active is true**.



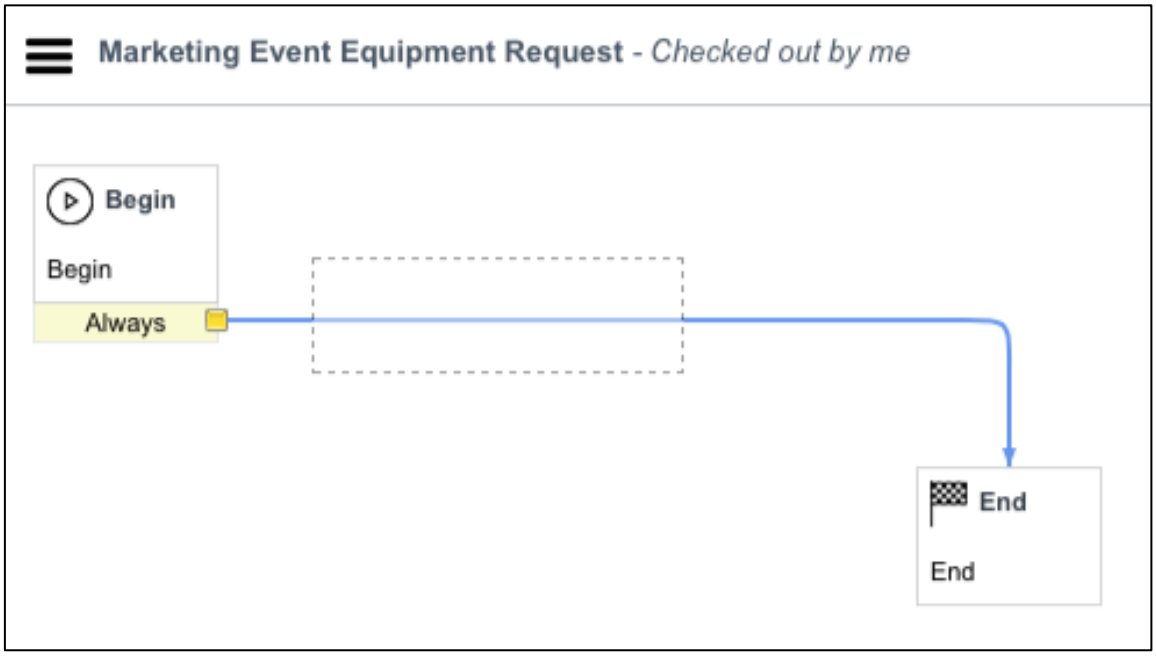
6. Click **Submit**. An empty workflow is shown. On the right, in the **Core** tab, is the palette of tasks and other activities you can add to the workflow.

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Add an If Activity

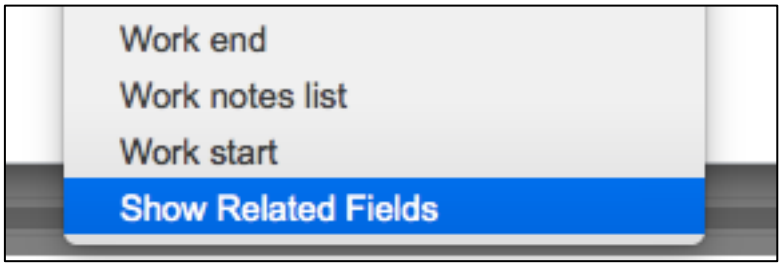
In this section, you add an activity to check if approval is required based on the equipment cost.

1. In the **Core** tab, expand the **Conditions** folder. Drag the **If** activity between the **Begin** and **End** activities. The connecting line will turn blue. Drop it there.



2. In the **New Activity: If** dialog **Name** field, enter **Over $500?**.

3. For the **Condition**, you will use the **Cost** field from the related **Hardware Model** table. To access the fields on the related table, from the **field** list, select **Show Related Fields**.

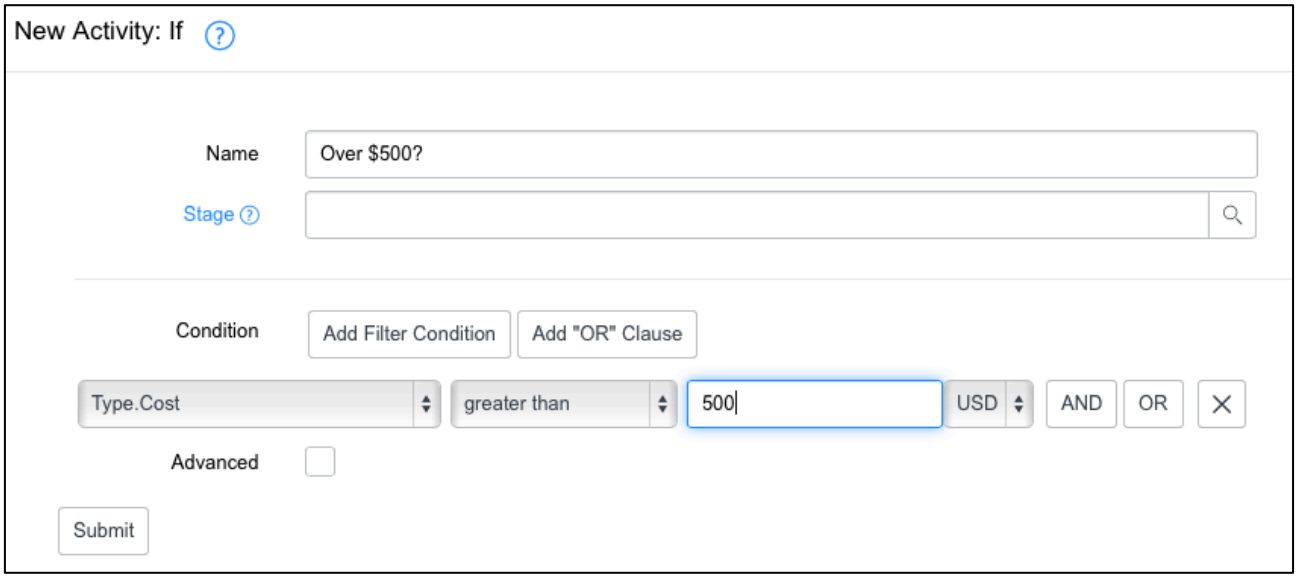


4. Select **Type** → **Hardware Model fields**.

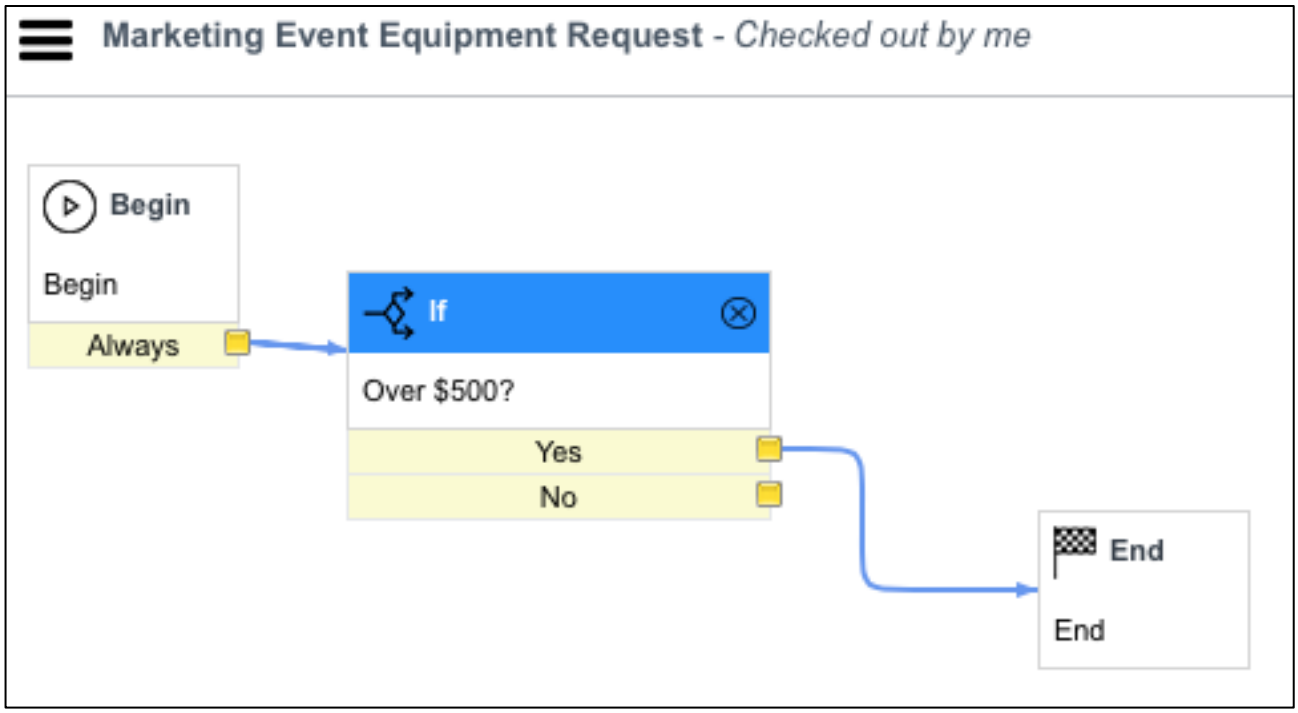
5. Select **Cost**.

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6. Complete the condition to read **Type.Cost greater than 500 USD**. The completed form is shown below.



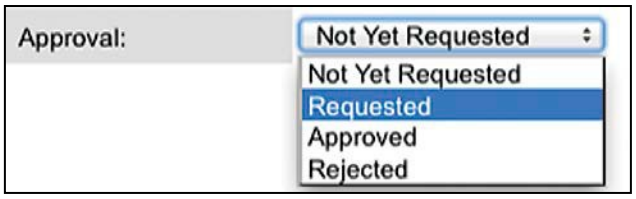
7. Click **Submit**.



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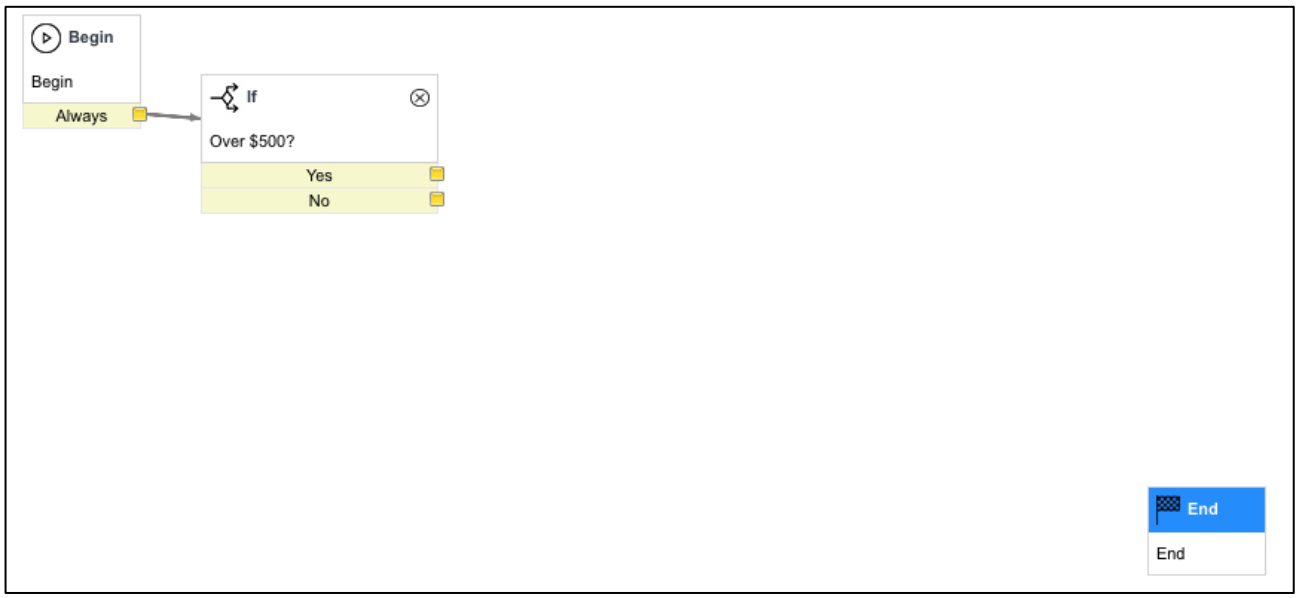
Add an Approval - User Activity

You want to track the status of the workflow in a field on the record itself so that the user who submitted the request can quickly know whether their request was approved or not. For this you use a field from the task table called Approval (remember that Equipment extends Task so you have access to all the fields in the task table). The Approval field can have four possible values as shown below—this works nicely for what you want to do.



Fortunately, by using approval activities, the workflow will set this field automatically as it progresses. In this section, you add manager approval.

1. To prepare for the workflow for the new activity, click the line that connects the **If** activity and the **End** activity. Press **Delete**. Move the **End** activity down and to the right.



2. In the **Core** tab, expand the **Approvals** folder. Drag and drop the **Approval-User** activity to the right of the **If** activity.

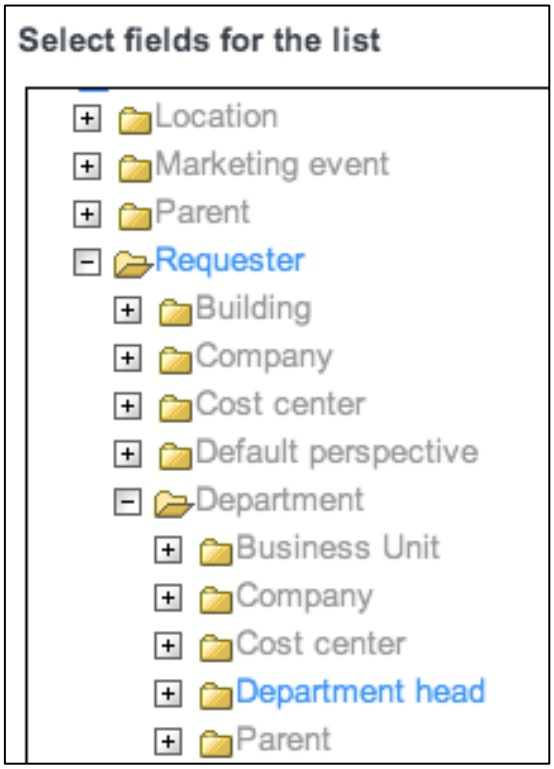
3. In the **New Activity: Approval – User** dialog, in the **Name** field, type **Manager Approval**.

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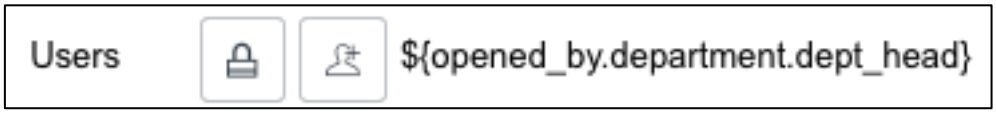
4. You can send the request to the requester's department manager. Click on  next to **Users.**

5. Click .

6. In the **Select fields for the list** dialog, expand **Requester**, expand **Department**, and click **Department head**.



7. Click . You should see the variable **${opened_by.department.dept_head}** in the **Users** field.



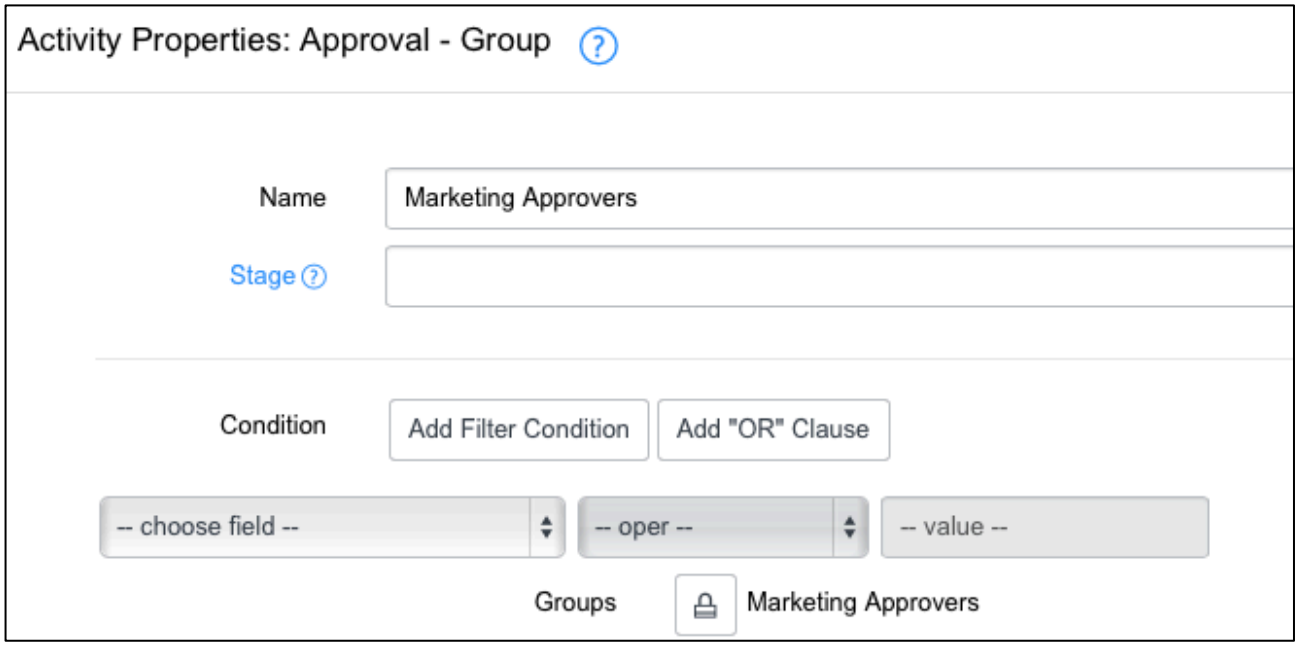
8. Click **Submit**.

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Add Approval - Group Activity

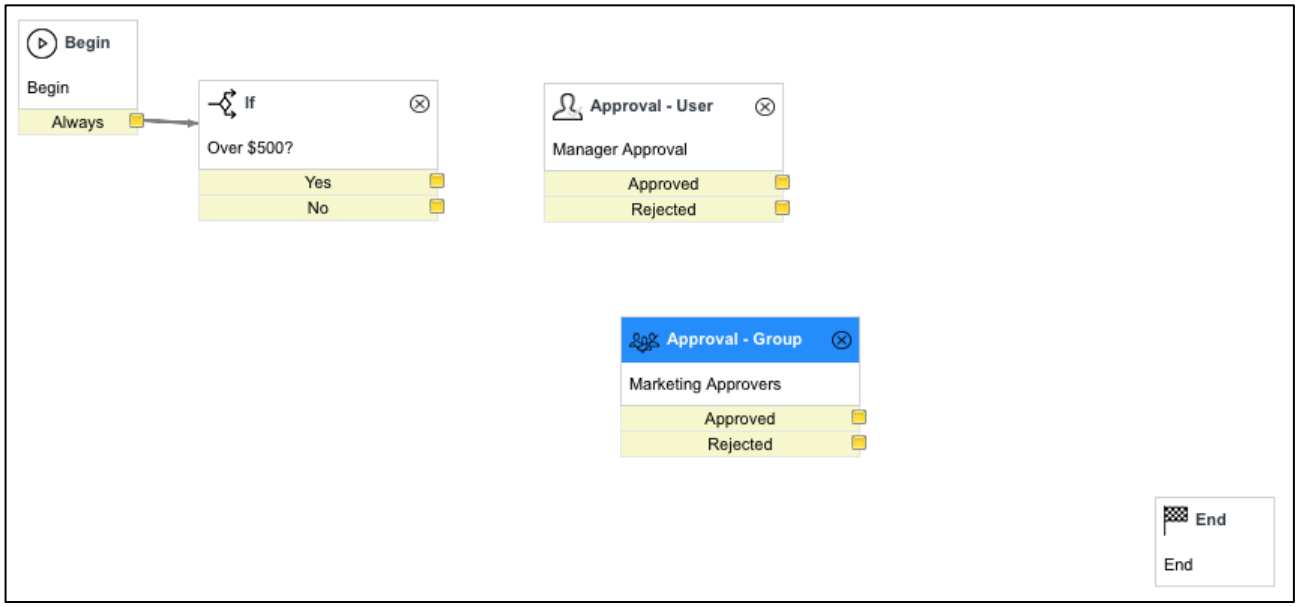
Now add the second level of approval by the Marketing Approvers group.

1. This time you add a group approval. Drag and drop the **Approval - Group** activity to below the **Approval - User** activity.
2. In the **Name** field, type **Marketing Approvers**.
3. Next to the **Groups** field, click .
4. In the **search** field, type **Marketing Approvers** and press **Enter**. Click .



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5. Click **Submit**. The workflow should now look like the example.



Add a Notification Activity

It would be nice for the requester to be notified if the request is rejected. Use a Notification activity for requester notification.

1. In the **Core** tab, expand the **Notifications** folder, drag the **Notification** activity to the canvas and drop it above the **End** activity.

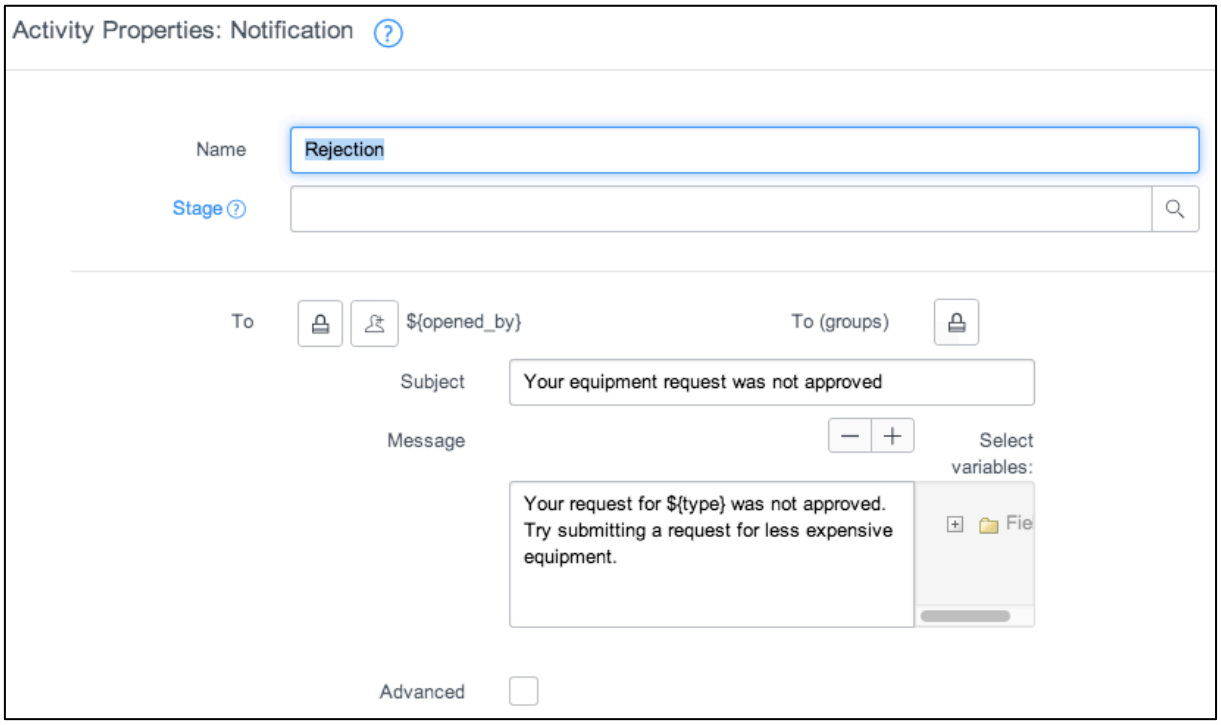
2. In the **New Activity: Notification** dialog, in the **Name** field, type **Rejection**.

3. Unlock the **To** field. Using the **Select fields dialog box** as you did before, select **Requester**.

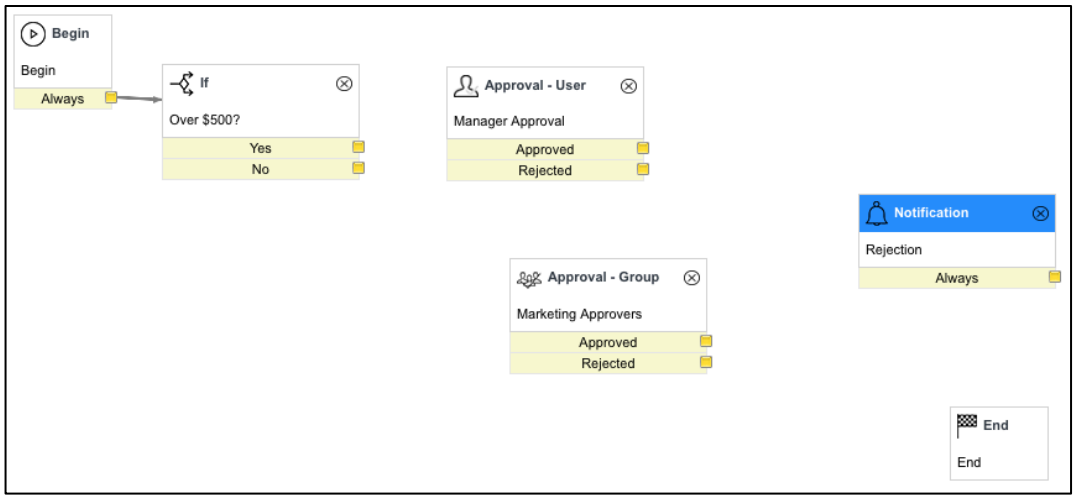
4. In the **Subject** field, type **Your equipment request was not approved**.

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5. In the **Message** field, type **Your request for ${type} was not approved. Try submitting a request for less expensive equipment**.



6. Click **Submit**. Your workflow should look like the example.



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Connect the Activities

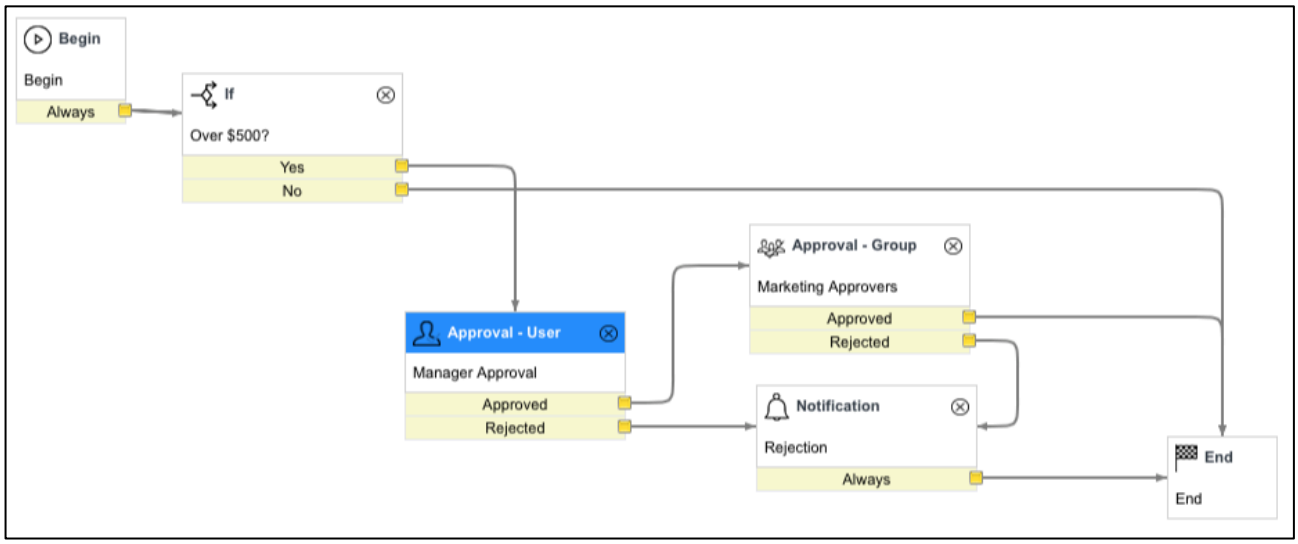
Now that all of the activities are in place, connect activity results to the appropriate next step in the process.

1. To connect activities, drag the square next to the activity result to the target activity. Alternatively, you can right-click on the activity result and select **Link to…** to use a dialog to make the connections. Use this table to make the connections:

From activity…	Drag result…	To activity…
If	Yes	Approval - User
If	No	End
Approval – User	Approved	Approval - Group
Approval – User	Rejected	Notification
Approval – Group	Approved	End
Approval – Group	Rejected	Notification
Notification	Always	End

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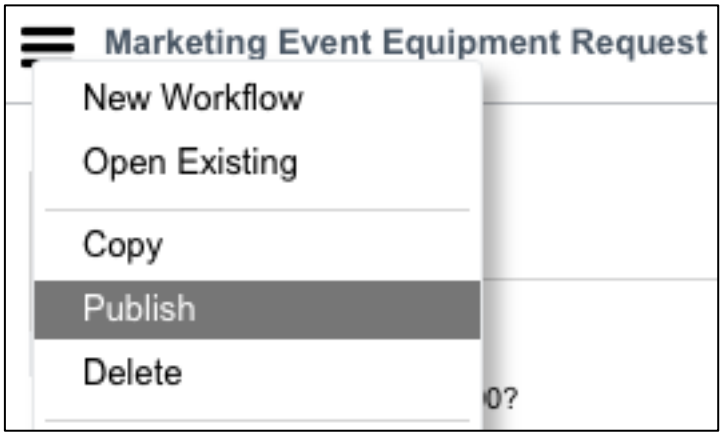
2. Rearrange the activities to make the process flow more readable.



Publish and Test the Workflow

The workflow is complete and ready to be activated. In this section, you will publish the workflow.

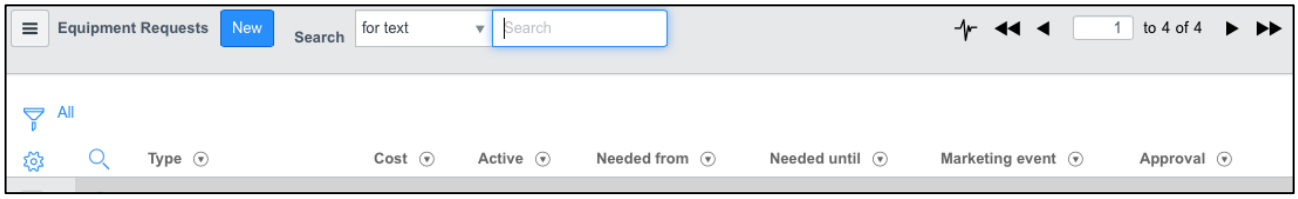
1. In the **Workflow Actions** menu, select **Publish**. The status at top should now show **Published**.



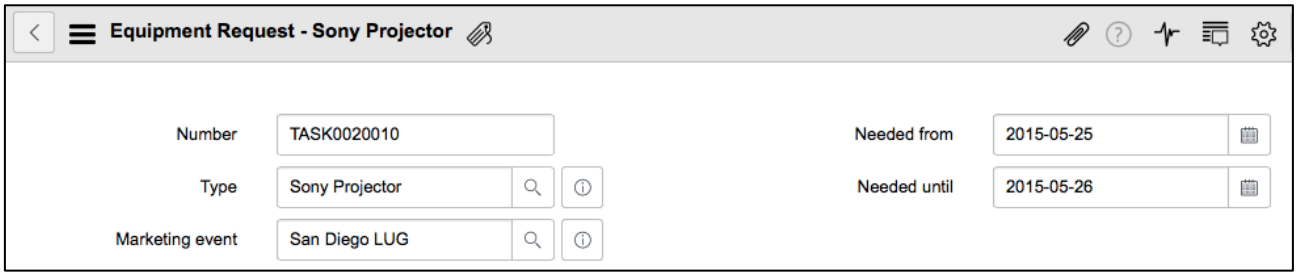
2. Before you test the workflow, make a simple addition to the Equipment list view. In the browser tab with the main application, navigate to **Marketing Events > Equipment Requests**.

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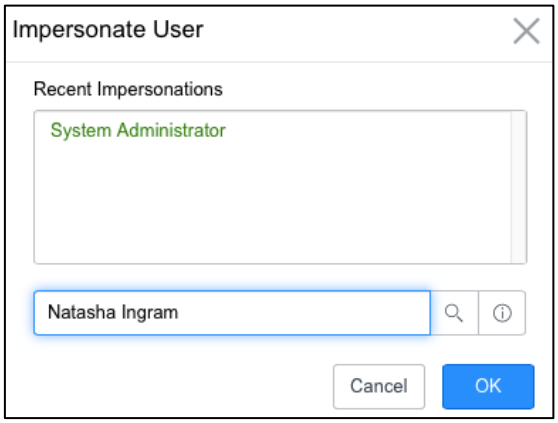
3. Configure the **Equipment Requests** list view and add the **Approval** field.



4. Now test the approval process. Enter a new equipment request for an equipment **Type** that costs more than **$500** (see sample below) and click **Submit**.



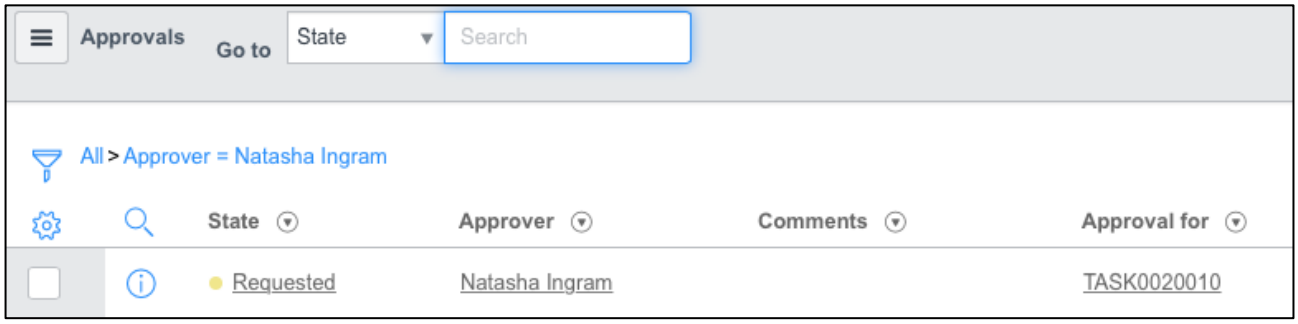
5. To see if someone got the approval request, you first need to log in as Natasha Ingram who part of the approval chain. As a System Administrator, you can impersonate other users in the system. Click  in the banner area and in the dialog that appears search for **Natasha Ingram**.



You should now be impersonating Natasha Ingram.

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6. Navigate to **Self-Service > My Approvals**. A list view of all the approval requests appears.

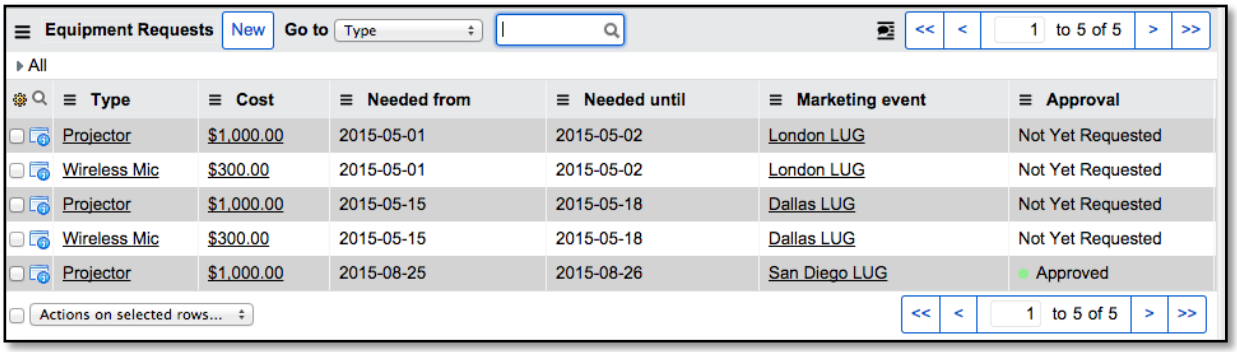


Click the **Requested** link for the recently submitted request.

7. Click **Approve**.

8. Now go back to the role of System Administrator. Click  again and double-click **System Administrator**.

9. Navigate to **Marketing Events > Equipment Requests**. The recently approved item should appear with the status **Approved**.



Notice that in this example you can change the approval field status directly. Though this may be fine in this example, in a real world scenario you may want to make this field read only for the user who submits the request.

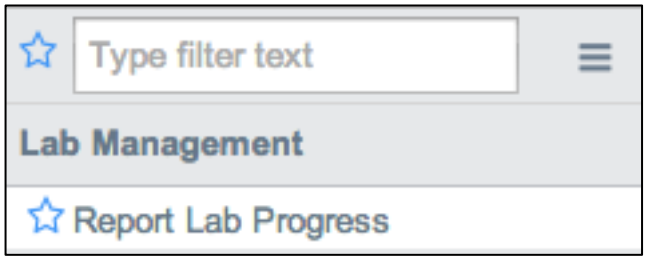
Workflows and approvals are extremely powerful features. With the ServiceNow Service Automation Platform this functionality is easily accessible by your applications.

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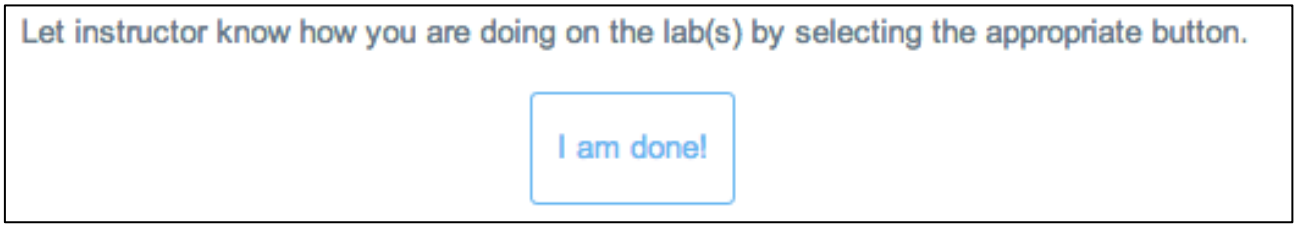
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



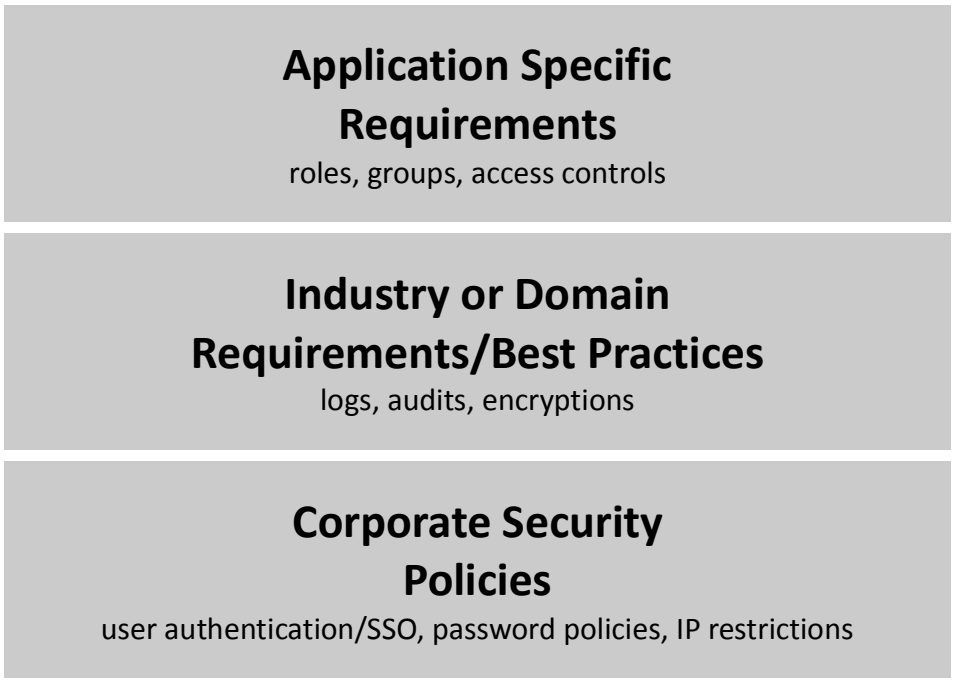
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Secure the Application

Lab 8
Security

Security is an important and multifaceted topic. The ServiceNow Service Automation Platform provides a variety of administrative controls and a fine-grained application security model to secure your applications.

The diagram below depicts one way to think about the security of the applications and some of the platform capabilities provided to address security requirements. At the bottom are the controls that are mandated by your company's security policies. On top of that may be industry-specific requirements and best practices. These two layers may be common across multiple applications. Finally, there is application-specific security that controls access to an individual application.



The platform security capabilities should not be looked at in isolation but should be used together to secure the application in an optimal fashion. In this tutorial, we defer security to a later lab. As a best practice, you should understand the security requirements for your applications and incorporate them into earlier stages of the implementation cycle.

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In this lab you look at two of the capabilities provided by the ServiceNow platform to secure your applications— roles and access control lists.

A role is a category that can be assigned to a user and can be granted access to particular parts of the system—in this case the marketing events application. When you used the application creator (e.g., lab 1), it conveniently created a new role (**x_marketing_events_user**) that you can assign to users that need access to this application.

Related Story
As a Marketing Event Manager, I need to limit access to the event, equipment and attendee information so that data is not altered unexpectedly and access to attendee contact information is restricted to only those who need to have that information.

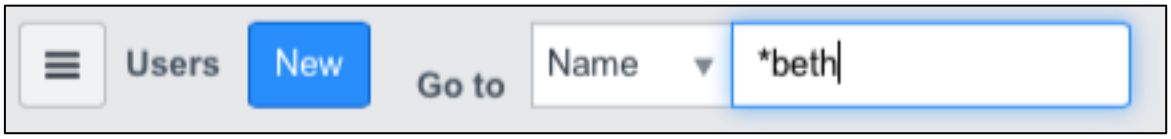
Test Default Application Role

Review the impact of having and not having the **x_marketing_events_user** role.

1. To test the current application security, **impersonate** Beth Anglin who does not have this role. If you trying to navigate to the **Marketing Events** application, it should not be visible.

2. Go to the **System Administrator** role to give Beth Anglin the role **x_marketing_events_user**.

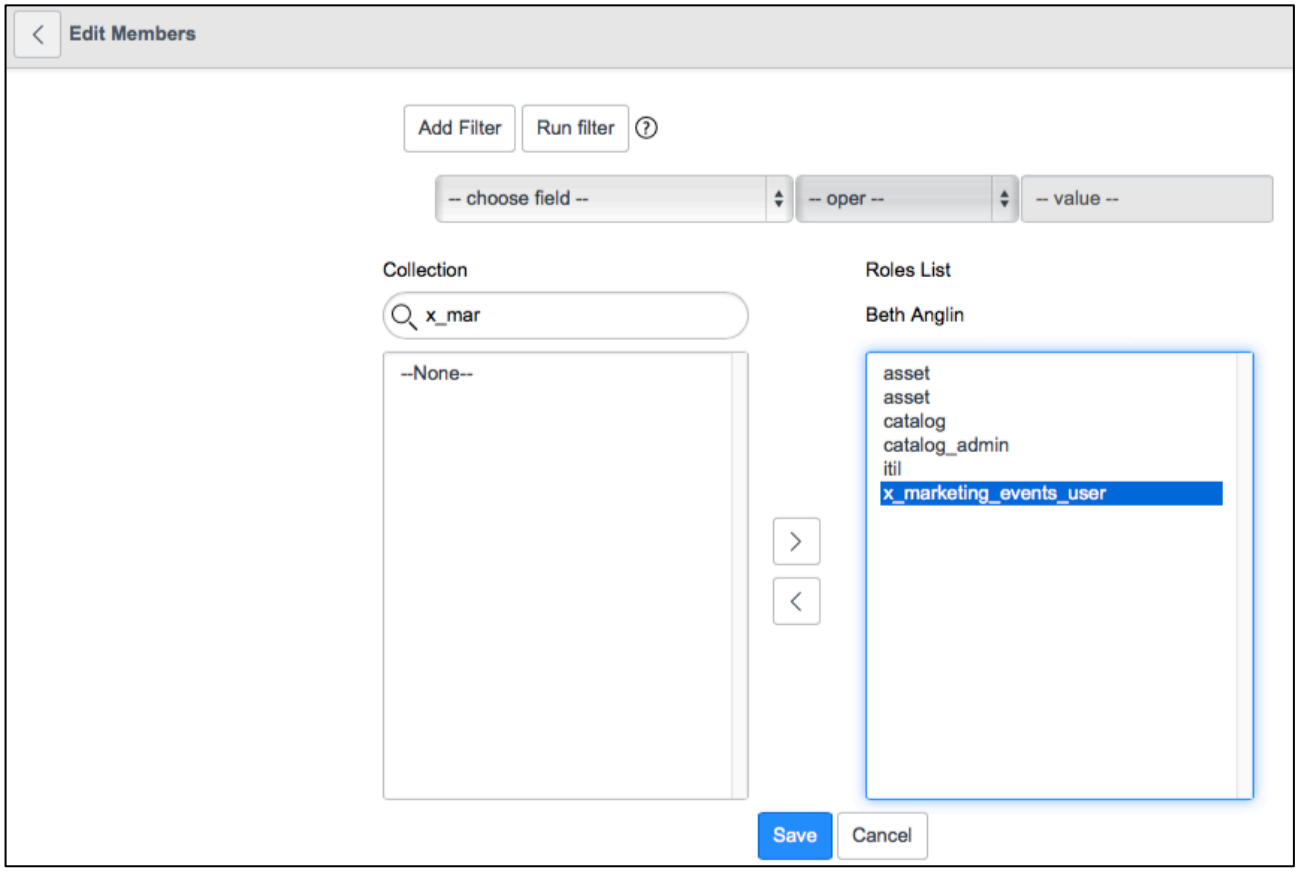
3. Navigate **System Security > Users and Groups > Users** and open the user record for **Beth Anglin**.



4. In the **Roles** section, click **Edit**.

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5. In the form, search for **x_marketing_events_user** and add it to the **Roles List**. Click **Save**.



6. **Impersonate Beth** again and navigate to **Marketing Events**. The application should appear.

7. After you confirm this, return to the **System Administrator** role to continue the lab.

Understand Access Control Lists (ACLs)

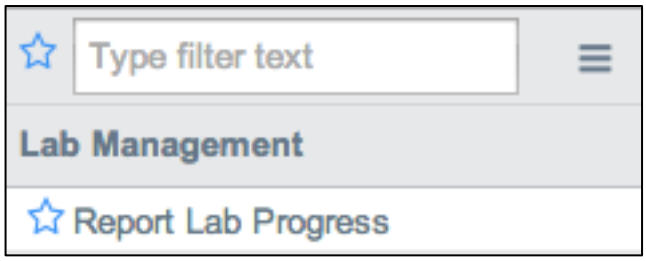
Defining a role gives visibility to the application only to users with that role. However, you may want to further restrict what a particular role or user is allowed to do. Access Control Lists is one of the mechanisms provided to restrict access at a fine level of granularity. Though we do not cover ACLs in this lab, it is an important concept to be aware of to secure your applications.

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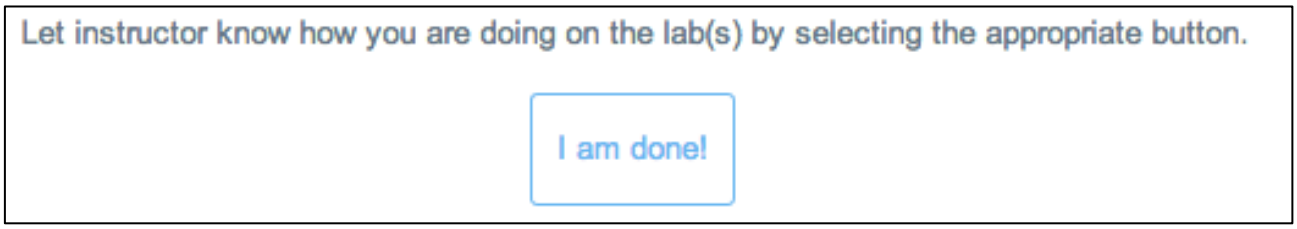
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



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Enforce Business Rules

Lab 9
Business Rules

You have built a fairly sophisticated system so far without having to write a single line of code. This is by design. The ServiceNow Service Automation Platform is designed to help you build your application declaratively, with mouse clicks. However, there may be instances in which the declarative features are not sufficient. In such cases, you can choose to write code. Almost all ServiceNow platform capabilities (including workflow, security, UI, and database) can be customized with JavaScript code.

This lab explores Business Rules, one of the more common scenarios that can benefit from custom code. Business Rules can be made to execute before or after a database operation like insert, update or delete. If you are familiar with relational database triggers, you will notice the similarity - Business Rules are indeed similar to triggers in relational databases.

You will write a Business Rule to calculate the number of attendees and update the registered attendee field on the marketing event table. This is a simple rule for illustrative purposes. Code written for the real world can be as complex as you wish.

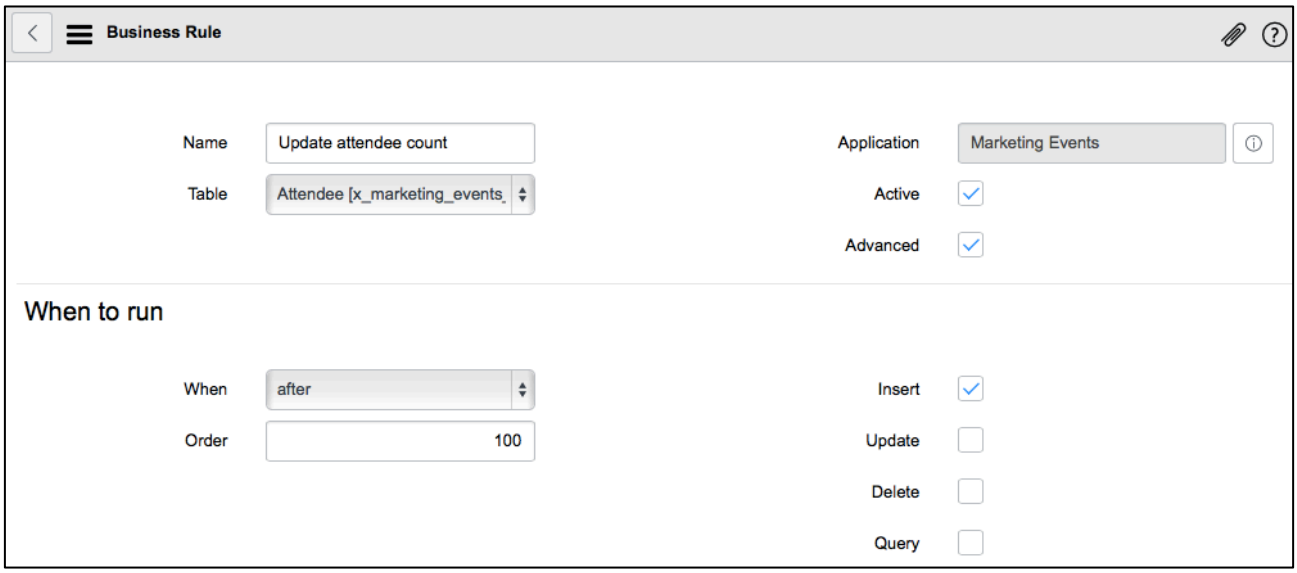
Related Story
As a Marketing Event Manager, I need the count of registered attendees to be calculated automatically so that we always have an accurate count without having to look up the information and manually enter it.

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Create a Business Rule

1. Navigate to **System Definition > Business Rule**s.
2. Click **New**. Fill out as shown below.

In this field…	Enter..
Name	Update attendee count
Table	Attendee [x_marketing_events_attendee]
Advanced	Checked
When	After
Insert	Checked

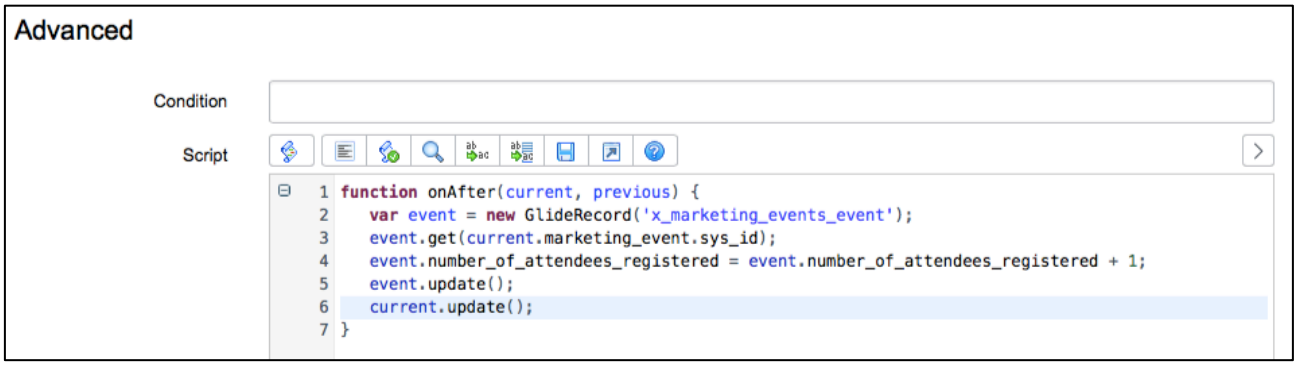


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3. In the **Script** field, type the following code.

   Note: `current` refers to the Attendee record in the current insert transaction. `marketing_event` is a field on the current record. `number_of_attendees_registered` refers to the field **Number of attendees registered** on the **Marketing Event** table.

```
function onAfter(current, previous) {
  var event = new GlideRecord('x_marketing_events_event');
  event.get(current.marketing_event.sys_id);
  event.number_of_attendees_registered =
event.number_of_attendees_registered+1;
  event.update();
  current.update();
}
```



4. Check the syntax by clicking . Click **OK** if the syntax is fine.

5. Click **Submit**.

6. Add an Attendees section to the Marketing Event form. Navigate to the **Marketing Event form**, right-click in the gray header bar, select **Configure > Related Lists**.
   Move **Attendee→Marketing Event** from the **Available** list to the **Selected** list and click **Save**.

7. Test by adding a few attendees for any of the events. The current registration count in the **Number of attendees registered** should reflect the inserts.

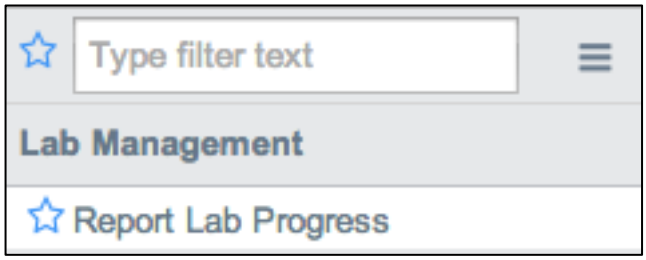
The ServiceNow Service Automation Platform enables you to build most of the functionality that you need with clicks. However as an application creator you never have to worry about hitting a wall or limitation of the platform—you can always customize with code when needed. In this lab, you looked at Business Rules that execute when a database operation occurs. Code-based customization is also an available option for other platform capabilities such as UI, security and workflows.

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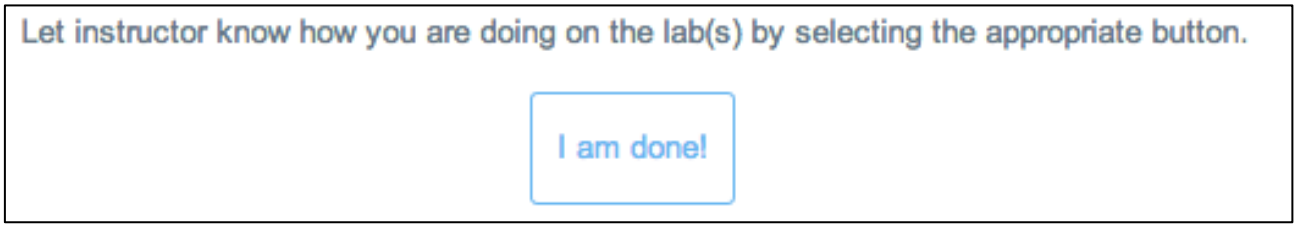
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



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Use Visualizations to Gain Perspective

Lab 10
Visualizations

This lab explains how to create a map view of the application as well as a timeline visualization.

In today's world, leaders need to see data in a way that provides insights to make better decisions. ServiceNow natively provides multiple mechanisms from Real Time Dashboards, Performance Analytics, and Bubble Charts, to interactive Maps and 3-D Timeline Visualizations.

As an application developer or administrator you can help your customers make sense of the data in front of them.

Related Stories
As a Marketing Event Manager, I need to visualize where my events are being held geographically so that I can make better use of my resources.

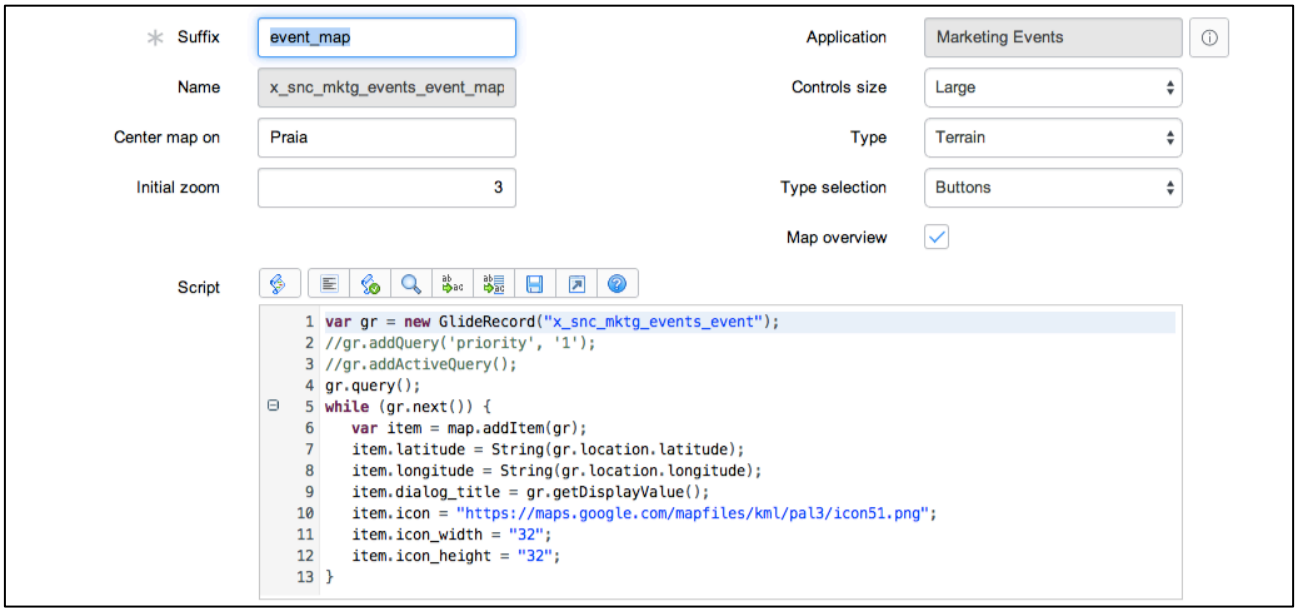
As a Marketing Director, I need to see at a glance which events are coming down the road so that I can get make sure the cadence of events is appropriate.

Create an Interactive Google Map

1. Navigate to **System UI > Map Pages**.
2. Open the **Critical Incidents** Map Page.
3. Right-click in the gray header bar and select **Insert and Stay**. This creates a copy of the map definition in the scope of the Marketing Events application.

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4. Make the following changes.
   - **Suffix:** event_map
   - **Line 1:** Change “incident” to “x_marketing_events_event”.
   - **Line 2:** Comment it out by typing “//” at the beginning.
   - **Line 3:** Comment it out by typing “//” at the beginning.



5. Check the syntax by clicking . Click **OK** if the syntax is correct.
6. Right-click in the gray header bar and select **Save**.
7. Click **Try It**.

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8. Zoom around the resulting map and click on your events.



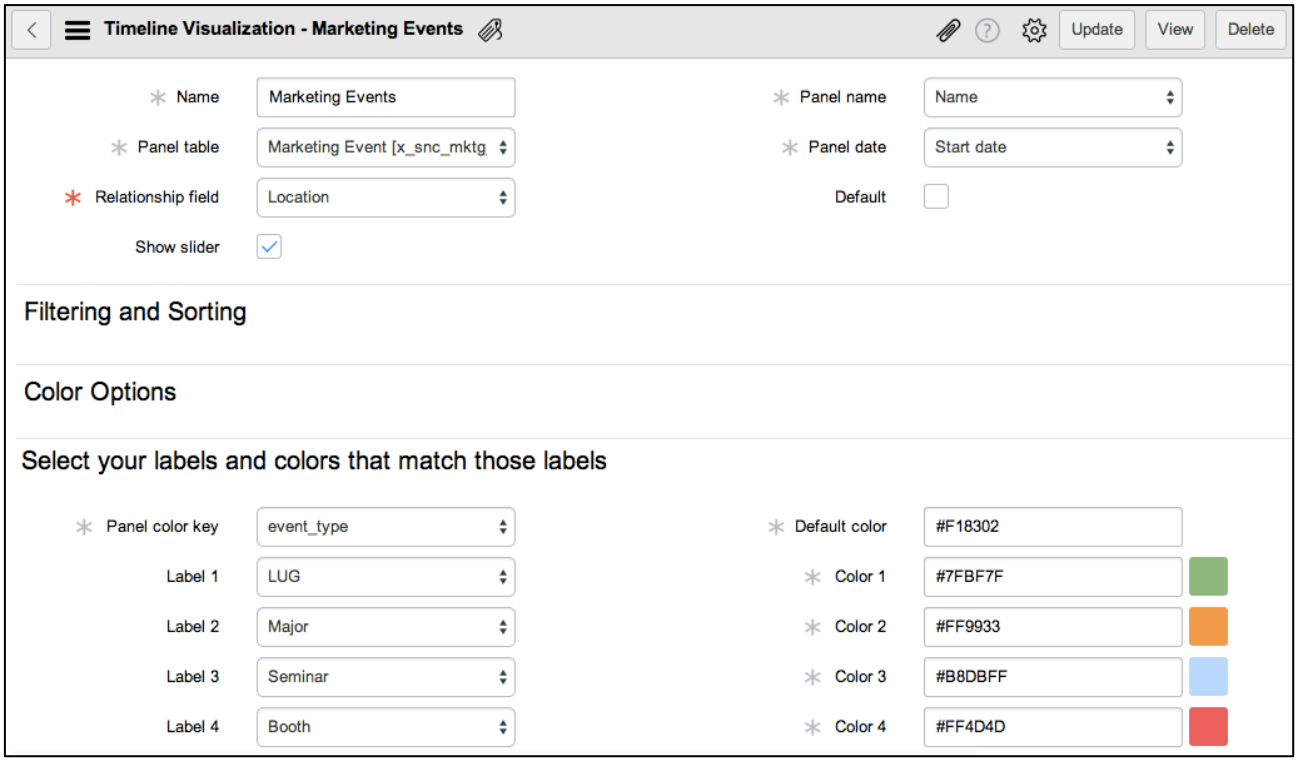
Create a Timeline Visualization

1. Navigate to **Timeline Visualization > Create New**.

2. In the **Timeline Visualization** form, fill out the fields as shown below. The Color Option fields should fill in automatically.

In this field…	Enter..
Name	Marketing Events
Panel table	Marketing Event [x_marketing_events_event]
Relationship field	Location
Panel name	Name
Panel date	Start date

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3. Right-click in the gray header bar and select **Save**.

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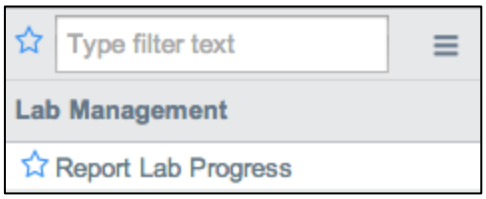
4. Click **View**.
   Your results should look like the example. You may need to move the slider to the points in time that your events are scheduled to start as denoted by the green dots at the bottom of the page. Use the **Settings** to modify various aspects of the visualization.



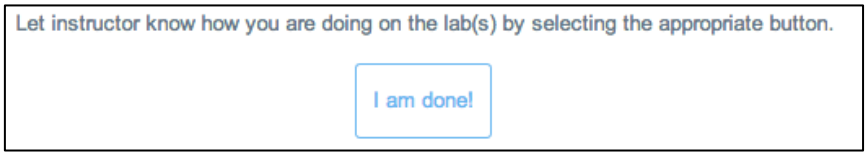
Progress Report

Let the instructor know you are done.

1. Navigate to **Lab Management> Report Lab Progress**.



2. Click **I am done!**



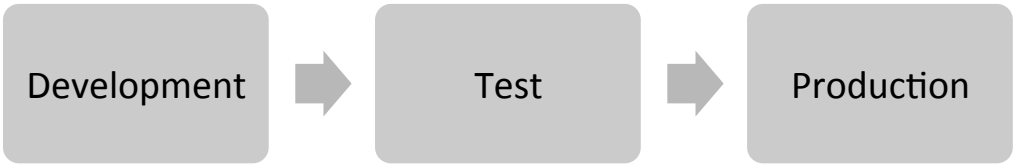
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Publish the Application

Your instructor will demonstrate this lab since it requires multiple instances.

Typically enterprises using ServiceNow have separate environments (or "instances") to support development, test, and production. This ensures production users are insulated from changes before they are thoroughly tested.

Lab 11
Publishing



To move applications from one environment to the other you need to publish the application, which packages all the artifacts related to an application.

This lab explains how to publish the application to make it available for installation on any instance in your environment.

Make the Application Available to Other Instances

This section explains how to take the first step in publishing by making the application available to other ServiceNow instances in your company's environment.

1. Navigate to **System Applications > Applications**.
2. Next to the **Marketing Events** application, click **Edit**.



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3. In the Related Links, click **Make App available on other instances**.

4. In the **Make App available on other instances** dialog, click **Submit**. When the upload completes the Marketing Events application is available for installation on all of the instances in the environment.

Install an Application from Another Instance

Now that the application is available, you can install the application from another instance.

1. Log on to another instance in your environment.

2. Navigate to **System Applications > Applications**.

3. In the **Downloads** section, find the **Marketing Events** application and click the **Install** button next to it.

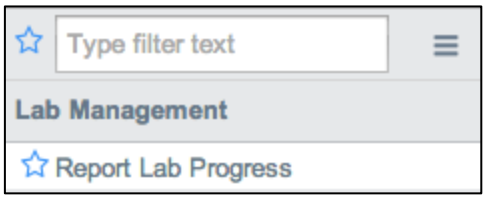
4. When updates are available for the application, come back to this page and go to the **Updates** section. Click on the **Update** button next to the application.

   Congratulations! You have taken a sophisticated application from concept to production in a very short time.

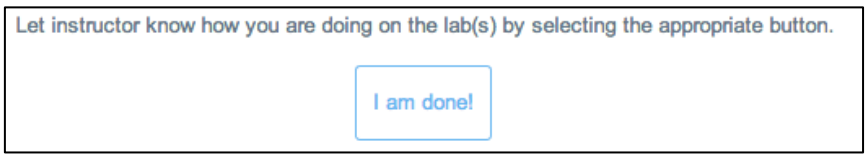
Progress Report

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Integrate with Other Systems

Lab 12
Integration

No application is an island. Most applications need to interact with other applications to either exchange data or participate in a business process. The ServiceNow Service Automation Platform offers a rich set of integration features to solve common integration challenges—data import and export (as discussed in Importing Data lab), real-time integration using Web Services and REST and prebuilt integrations to other systems.

Web Services provide standards based mechanism to connect systems together. The platform provides support for both SOAP and REST services. A SOAP based web service and a REST API is automatically generated for all the tables.

Access API Definitions

1. To access the web service definition of a type, type the following URL into your browser (replace **<instance_name>** with the name of your instance and replace **<table_name>** with the name of the table you want to access:

   https://<instance_name>.service-now.com/<table_name>.do?WSDL
   For example, https://<instance_name>.service-now.com/incident.do?WSDL.

2. To access the REST API endpoint syntax, type the following URL into your browser (replace **<instance_name>** with the name of your instance):

   https://<instance_name>.service-now.com/$restapi.do

3. Click **Explore**. The REST API Explorer allows you to construct API commands and output the code in multiple languages.

4. In the **tableName** field, select **incident**.

5. Click **ServiceNow Script** to generate the code to execute that API command. **Close** the dialog.

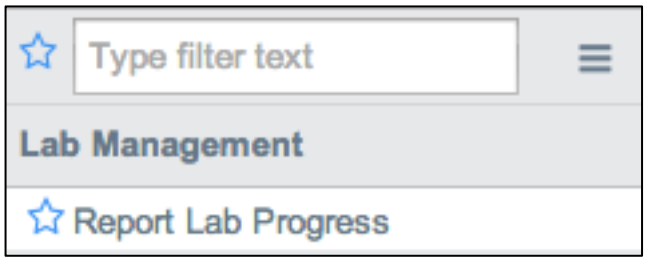
6. Click **Send** to perform the request to your instance. Scroll down to see the structure of the response.

You can use the information provided by the WSDL and REST API Explorer to implement custom, programmatic integrations with other applications in your environment.

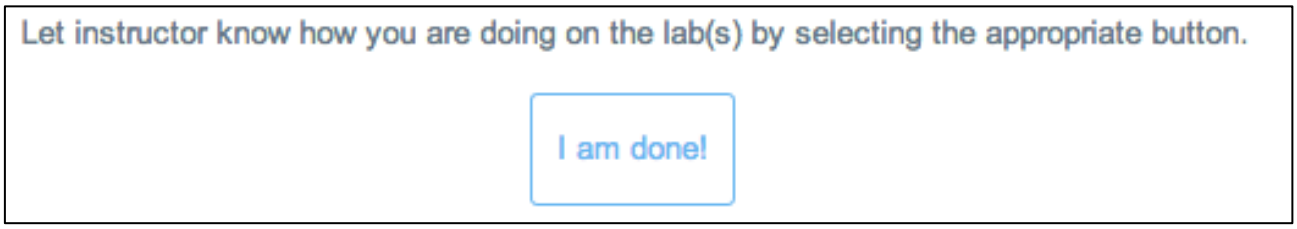
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Progress Report

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