

Become a Rapid Developer

Agenda

1 Make it w/ Mendix

2 Make it together

3 Make it w/ Mendix Studio

4 Make it dynamic

5 Make it automated

6 Make it w/ Mendix Studio Pro

7 Make it smart

8 Make it valid & consistent

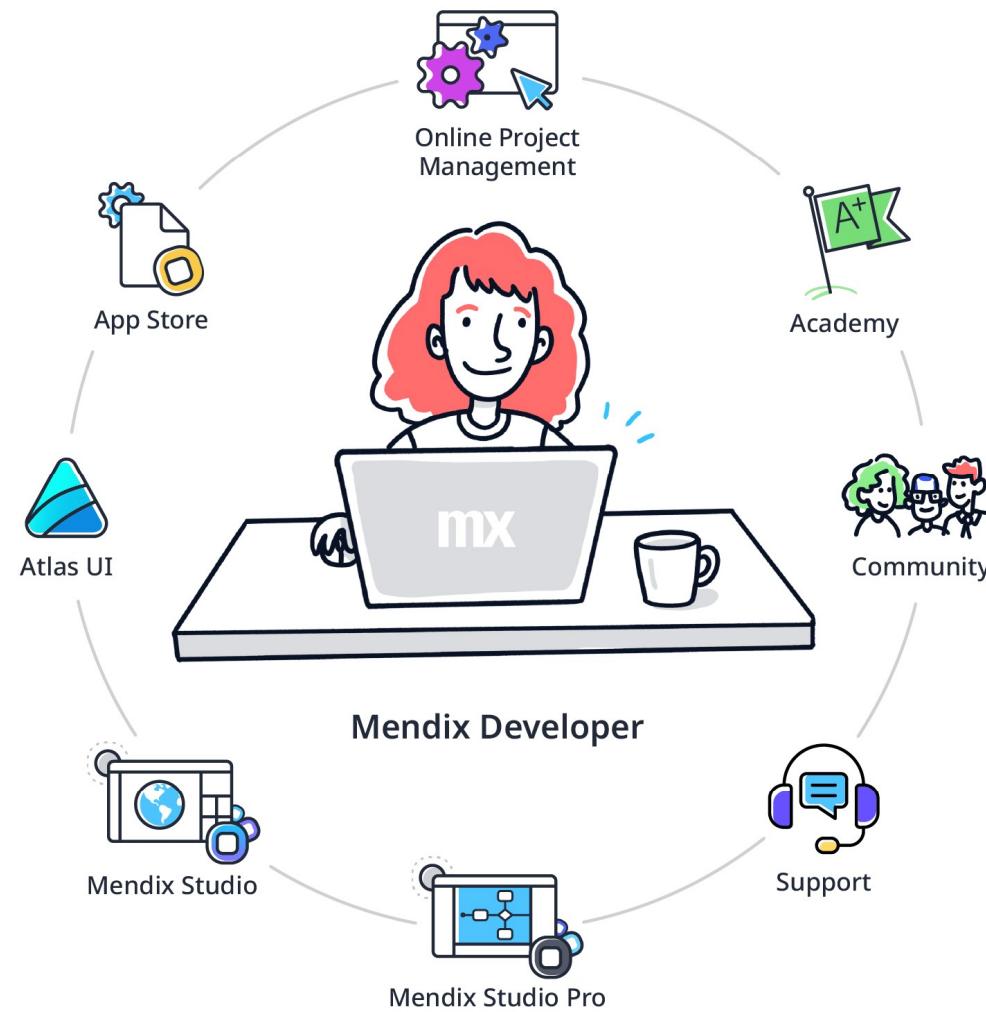
9 Make it secure

10 Make it mobile

11 Go make it!

Make it w/ Mendix

Mendix Ecosystem





Set Up Your Community Profile...



Jimmy
CEO at [LearnNow](#)
Rotterdam, Netherlands

OVERVIEW CONNECTIONS CHALLENGES BADGES PORTFOLIO ACTIVITY 

... And Change Your Avatar

Knowledge checks

Go to kahoot.it

A critical success factor for companies working with Mendix is:

- A. knowing object- oriented programming
- B. working in small cross-functional teams
- C. implementing the waterfall project management approach
- D. working individually on projects depending on expertise

How can you get the latest Mendix Studio Pro?

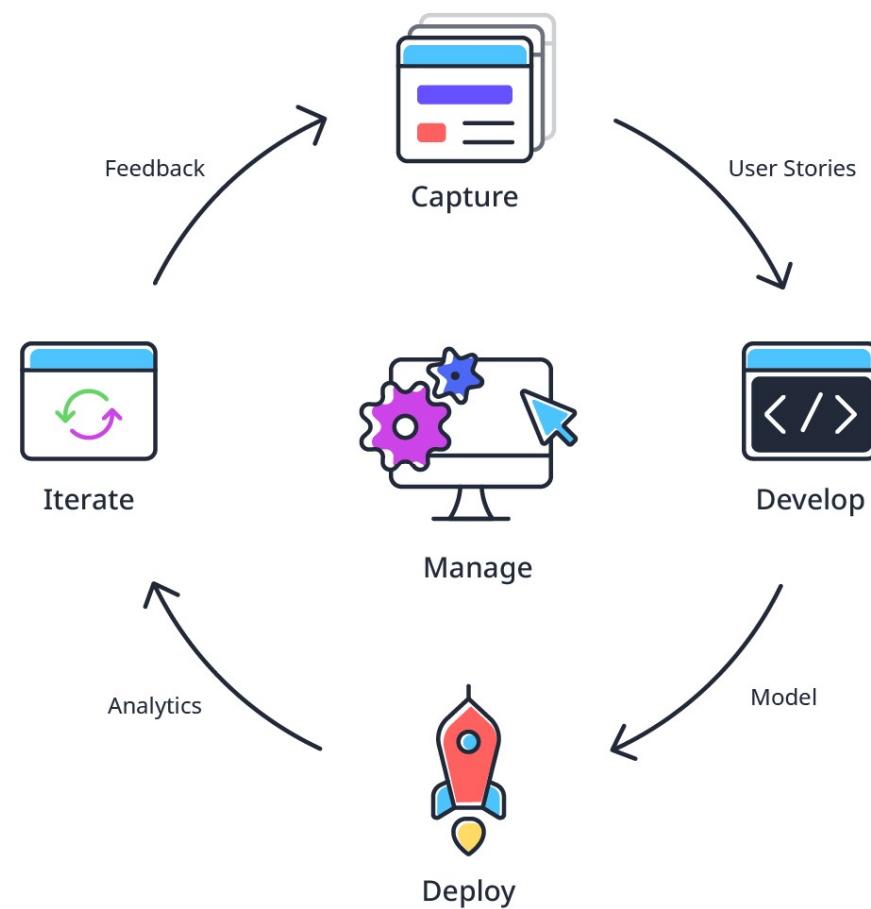
- A. By buying it from Mendix.com
- B. By calling Mendix support and asking if they can email it to you
- C. By downloading it for free from the Mendix Appstore
- D. By purchasing a Mendix license

What is the Mendix Modeler?

- A. A Business Process Management tool to model and manage your company's workflow
- B. A CRM tool that offers out of the box CRM capabilities
- C. A tool to create, develop, and deploy innovative apps at light speed
- D. A tool to analyze big data using advanced Business Intelligence algorithms

Make it together

Application Lifecycle Management



Our Use Case: LearnNow

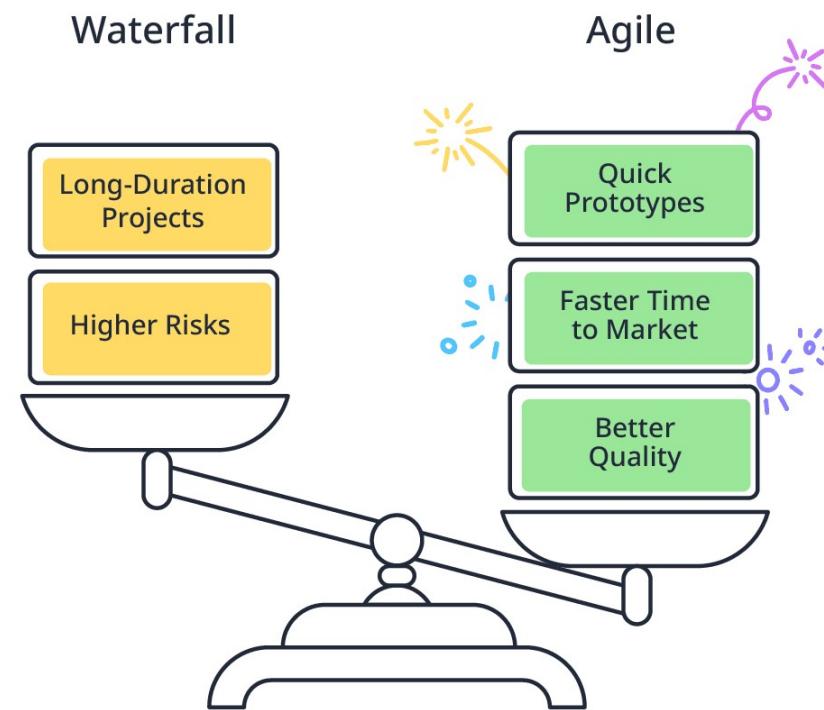
Jimmy is the director of the LearnNow company, which offers various trainings. He uses Excel to manage the training courses that the company offers. As the company is growing, it's becoming more and more difficult to keep a clear overview of all the courses.



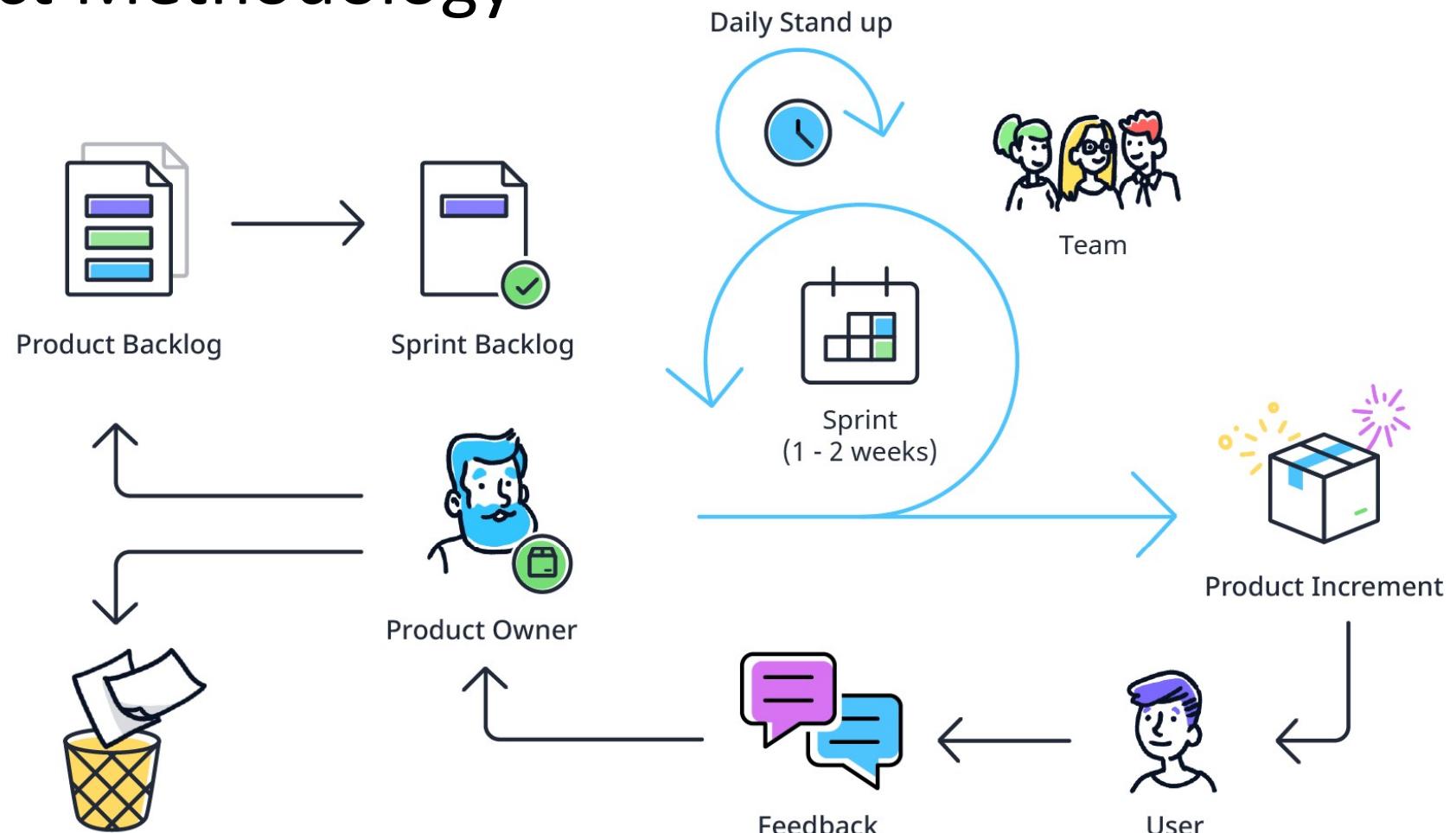
Create a New Project

The image shows a screenshot of the Mendix application interface. At the top, there is a navigation bar with the 'mx' logo, 'Buzz', 'Apps', 'People', 'App Store', and 'Community' tabs. To the right of the navigation bar are icons for help, notifications, and a user profile. Below the navigation bar, the word 'Buzz' is displayed next to a gear icon. On the right side of the screen, there is a search bar with the placeholder 'Search' and a magnifying glass icon. A large green button labeled 'Create App' is visible, with a black hand cursor pointing at it. The overall interface has a clean, modern design with a white background and light gray accents.

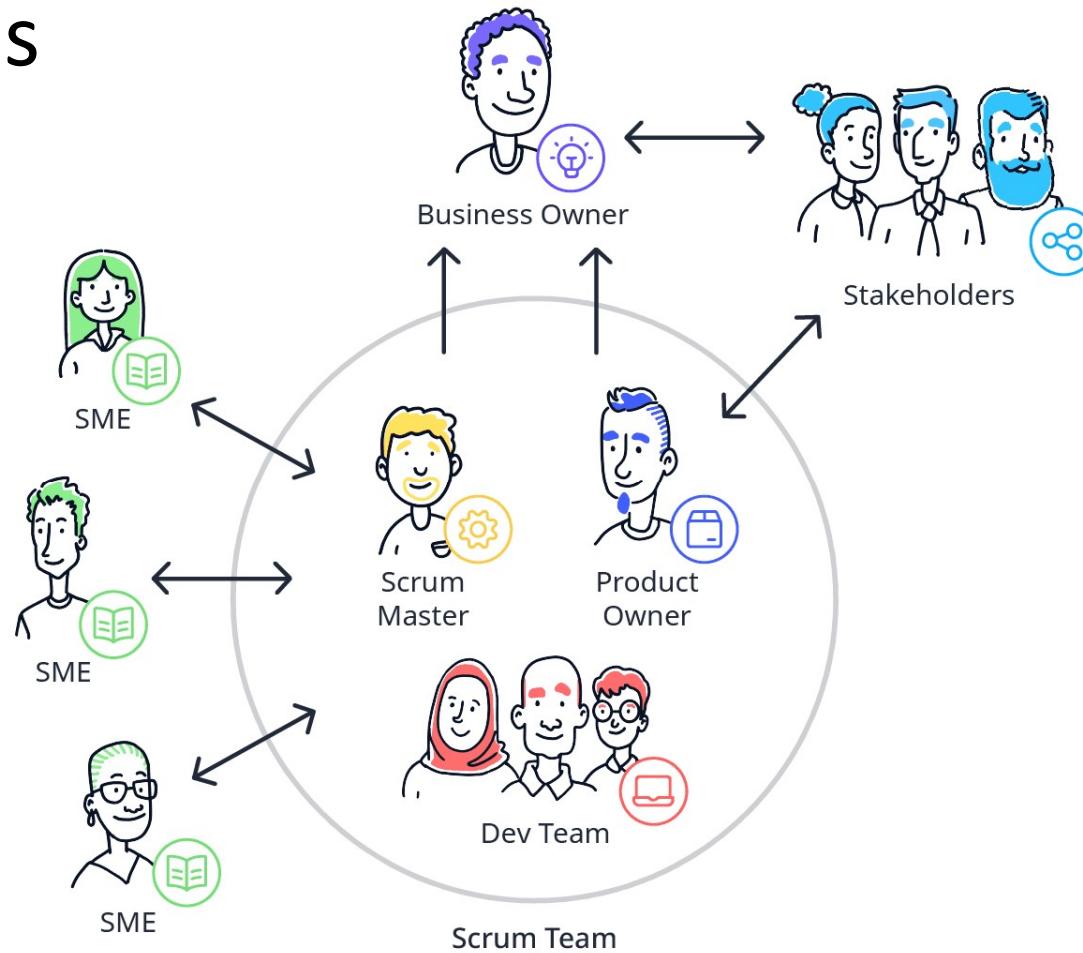
Project Methodology

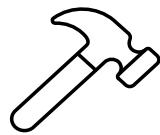


Project Methodology



Project roles





Invite your Team Members

COLLABORATE

Buzz

Team ← Everything related to your team

Stories

Feedback

Documents

DEVELOP

Model

Team Server

Planning

DEPLOY

Environments

Change roles and permissions →

Manage Team Invite Member

NAME	ROLE
 Jimmy	SCRUM Master
 Simone	Business Engineer

2 Team members

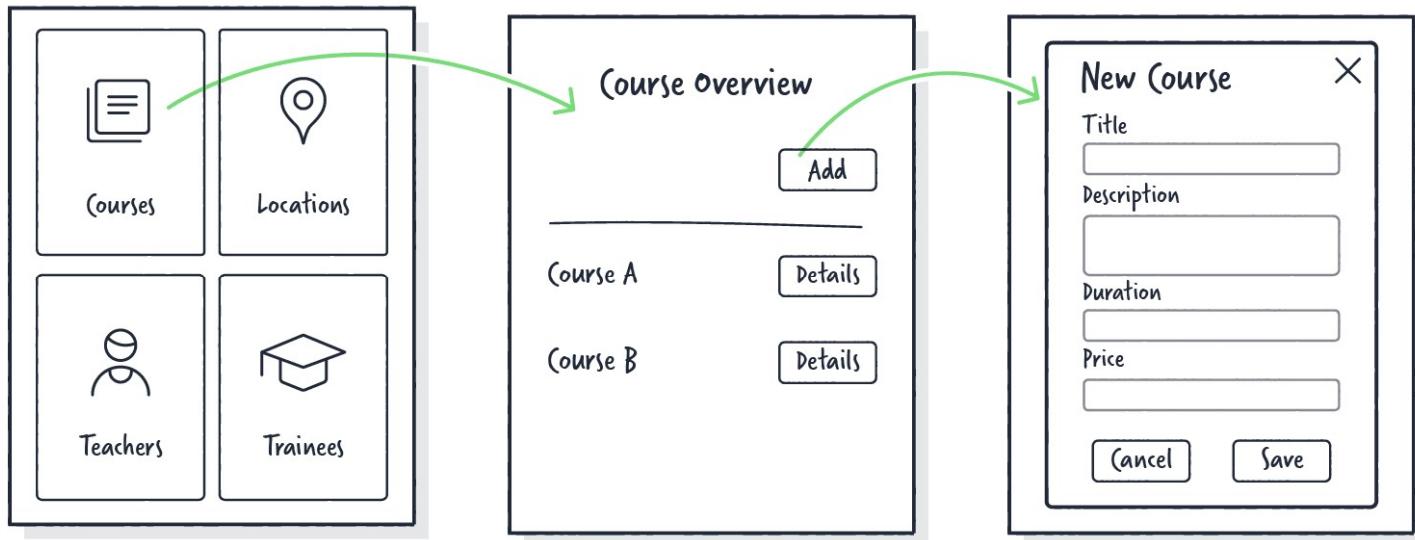
User Stories

- Break down of work on a project
- Ideally expressed such that each item has value to the users or customers of the product
- Measured with Story points

As a **<user type>**, I want **<what>**, so that **<business value>**.



Create a Wireframe



Adding User Stories

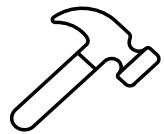
The screenshot shows the Mendix application interface with the 'Stories' module open. The left sidebar contains navigation links for 'COLLABORATE', 'DEVELOP', 'DEPLOY', 'OPERATE', and 'SETTINGS'. The main area displays a search bar and various action buttons: 'New story', 'New sprint', 'Move to', 'Label', and 'More'. A 'Show filters' button is also present. Below these, a story card is shown with the title 'Get started • 1 Story (5 points)' and a due date of 'Due 09 Jul'. The story details include:

- Story type:** Feature
- Story points:** 5 points
- Labels:** (empty)
- Description:**

I need to be able to view and manage all my:
- Courses
- Locations
- Teachers
- Trainees

When I am at the office, I use my desktop, but when I am travelling for work, I mostly use my tablet and mobile phone. Therefore, it's really important for me to be able to manage all of the above data from desktop, tablet, or mobile.

At the bottom of the story card are 'Post story' and 'Cancel' buttons.



Add the User Stories

- Import the user stories
- Complete 'Get Started' sprint

Knowledge checks

Go to kahoot.it

You can create a new app from the Mendix Developers Portal.

- A. True
- B. False

If a scrum team gets stuck, because of things that are out of their control, who is responsible to remove those impediments?

- A. The Scrum Master
- B. The Project Manager
- C. The Product Owner
- D. The Development Team

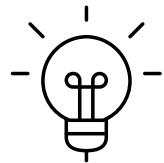
Where do you capture your project requirements?

- A. At the Stories tab underneath Collaborate in your project's dashboard.
- B. In the Stories tab in the Mendix Modeler.
- C. The project manager maintains a requirements document.
- D. In a text document that you share with your team members.

How many default App Team roles are there?

- A. 5
- B. 4
- C. 7
- D. 6

Make it w/ Mendix Studio



User Story 1

As an administrator, I want to be able to easily access and manage my data, so I can run my company more efficiently.



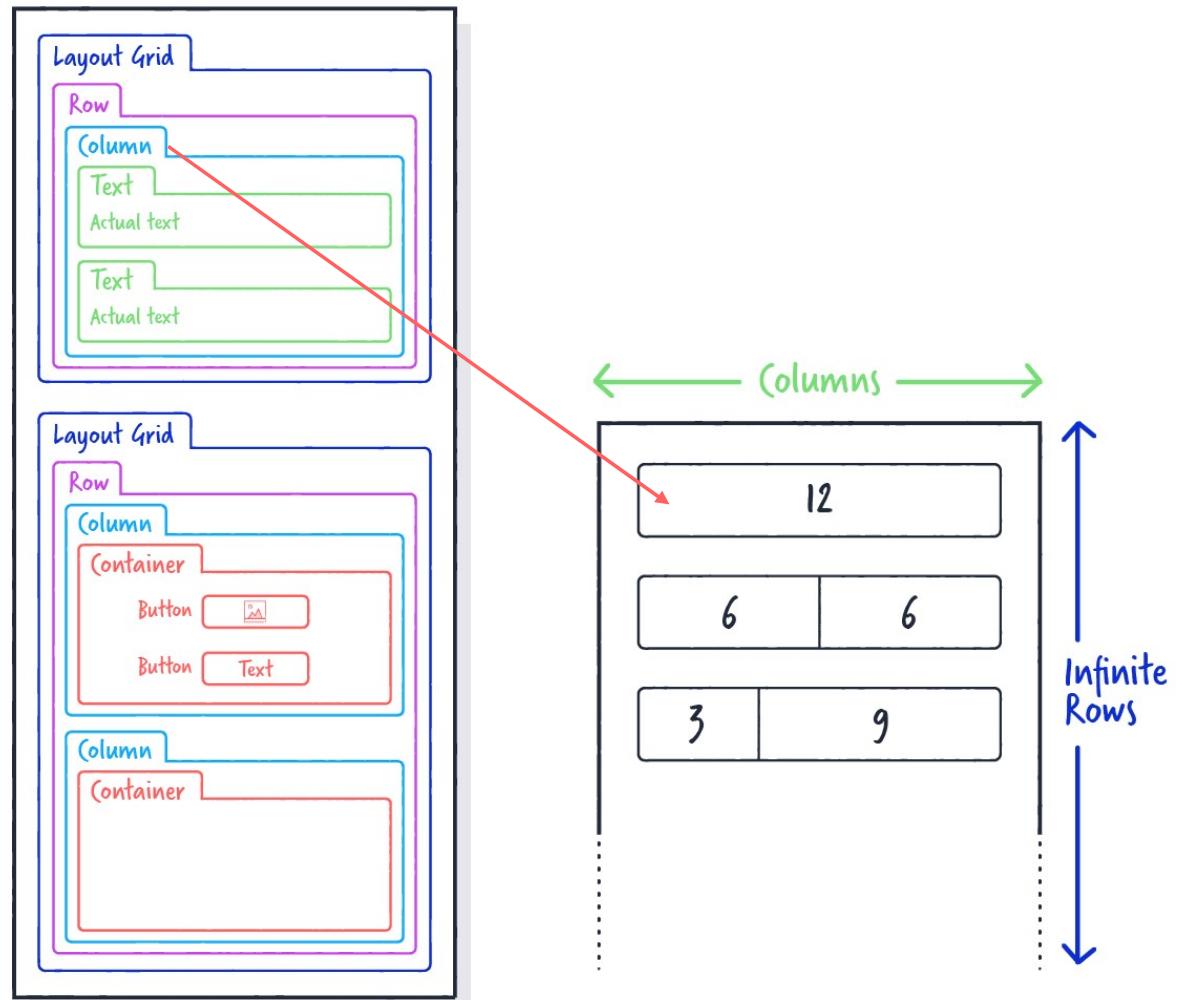
Open the App in Mendix Studio

The screenshot shows the Mendix Studio interface. On the left is a dark sidebar with icons for file operations, search, and settings. The main area displays a "Home" page with the title "Home" and the subtext "Welcome to your new app". A "COLUMN" placeholder is visible in the center. To the right is a "Toolbox" containing categories like "Widgets" (selected), "Building Blocks", "Data Containers" (with sub-options for Data View, List View, and Data Grid), "Columns" (with sub-options for 1 Column, 2 Columns, 3 Columns, 4 Columns, 6 Columns, Sidebar Left, and Sidebar Right), and "Input Elements" (with sub-options for Text Box, Text Area, Date Picker, Drop Down, Check Box, Radio Buttons, and three circular icons with icons inside). At the bottom, there are tabs for "Navigation Layout" and "Page". The top bar includes buttons for "Preview", "Publish", "Checks", and a help icon.

Create columns

- Layout grid
- Containers
- Widgets

Navigation Layout





Create the Homepage

1. Open the Home page
2. Create page layout
3. Add buttons
4. Add pages
 - Layout: Atlas_Default
 - Template: List Default
 - Naming convention
5. Link buttons to pages



Knowledge checks

Go to kahoot.it

A page is responsive when:

- A. It works and looks good on all devices
- B. It rotates as you rotate your mobile
- C. It allows dynamic data to be displayed
- D. It includes user interaction

When using the Layout Grid, the weight of all columns must add up to:

- A. 4
- B. 12
- C. 6
- D. 16

It is possible to add multiple widgets in a container.

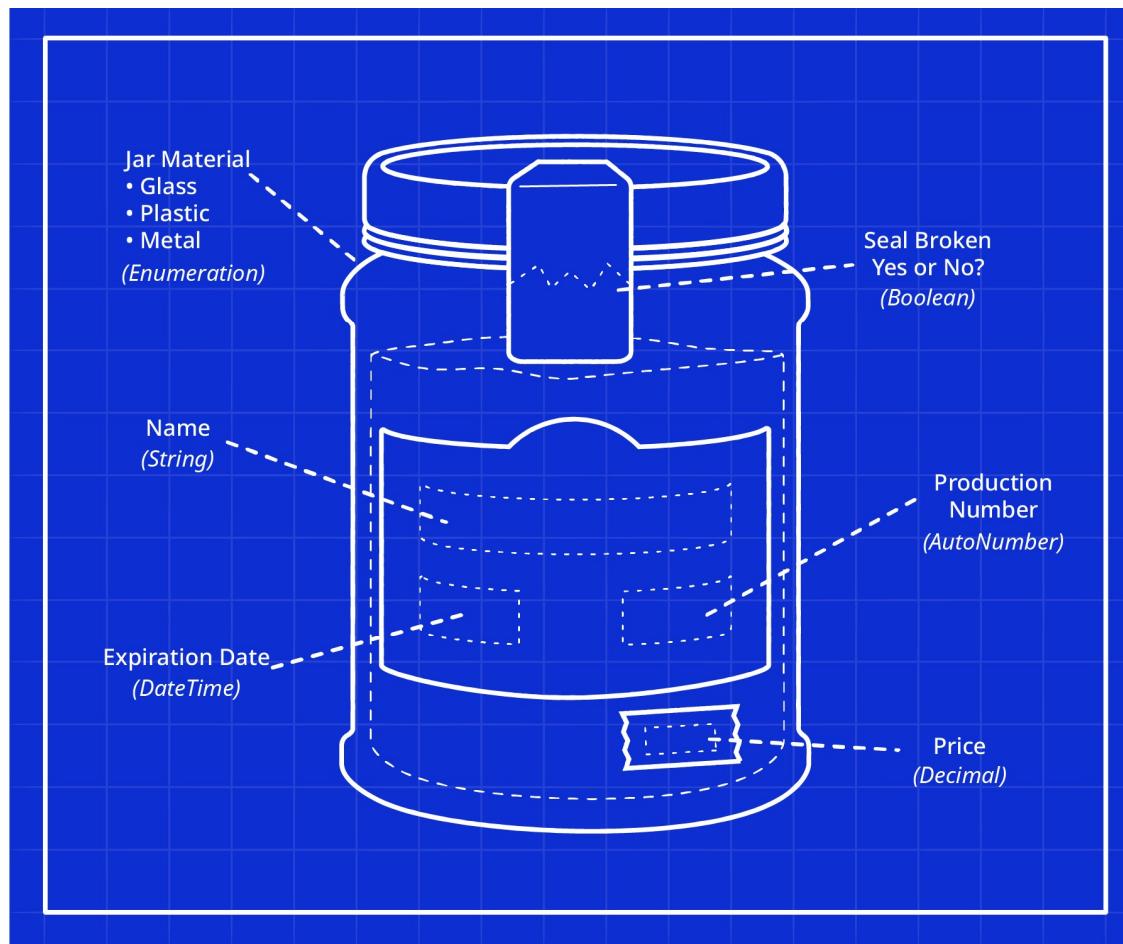
- A. True
- B. False

You can have different row layout for mobile, tablet, and phone.

- A. True
- B. False

Make it dynamic

Entities and Attributes





Define Attribute Types

Entity: Course

Attributes	Example	Attribute type
Title	<i>Rapid Developer</i>	<i>String</i>
Description		
Duration (in days)		
Price		

Entity: Location

Attributes	Example	Attribute type
Name		
Address		

Entity: Teacher

Attributes	Example	Attribute type
Name		
Email address		

Entity: Trainee

Attributes	Example	Attribute type
Name		
Address		
Email address		



Add dynamic data to pages

The screenshot shows the Mendix studio interface with the following details:

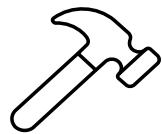
- Header:** Course_Overview
- Toolbars:** Preview, Publish, Checks, Toolbox, Properties, Buzz.
- Left Sidebar:** Navigation Layout, Page, Layout Grid, Row, Column, Container, List View (selected).
- Content Area:**
 - Title:** Here you can put a paragraph as subtitle.
 - List View:** No data source.
 - Items:** Five items, each with a placeholder profile picture, Title, Detail Text, and ID (0612345678). Each item has a "Details" button.
 - Properties Panel:** Data Source (Database selected), Entity (Select entity), Events, On Click Action (Nothing selected), General, Page Size (10), Read-Only (switched on), Design, Spacing Top, Spacing Bottom, Spacing Left, Delete, and a Chat icon.

Course overview

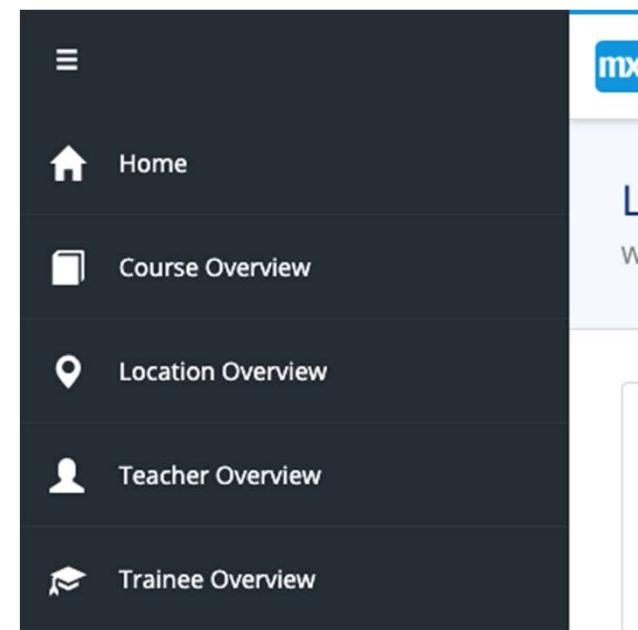
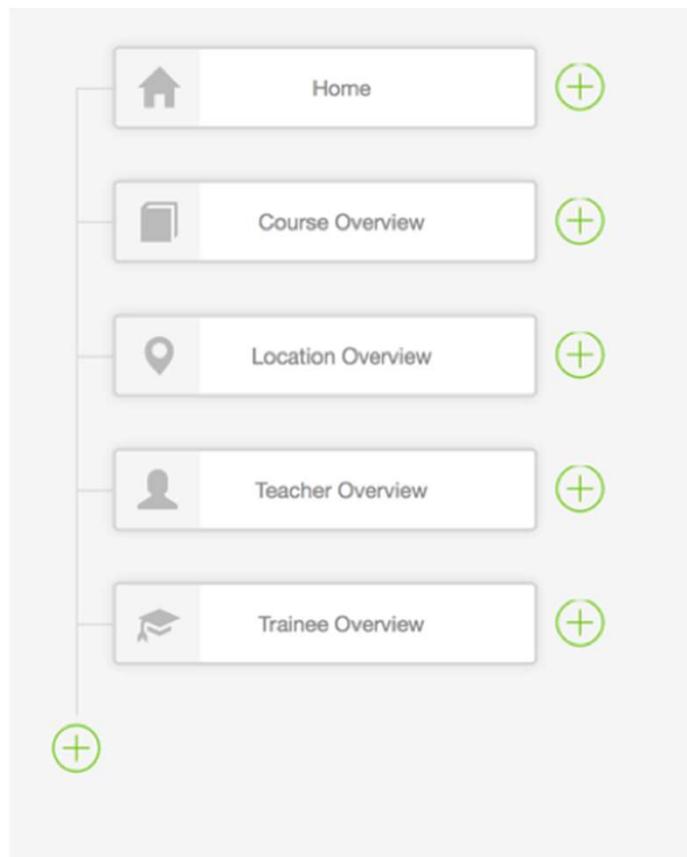
The complete LearnNow training collection

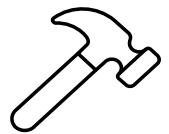
The published page displays five course cards, each containing dynamic data:

- Card 1:** {Title}, Duration: {Duration} days, Price: {Price}
- Card 2:** {Title}, Duration: {Duration} days, Price: {Price}
- Card 3:** {Title}, Duration: {Duration} days, Price: {Price}
- Card 4:** {Title}, Duration: {Duration} days, Price: {Price}
- Card 5:** {Title}, Duration: {Duration} days, Price: {Price}

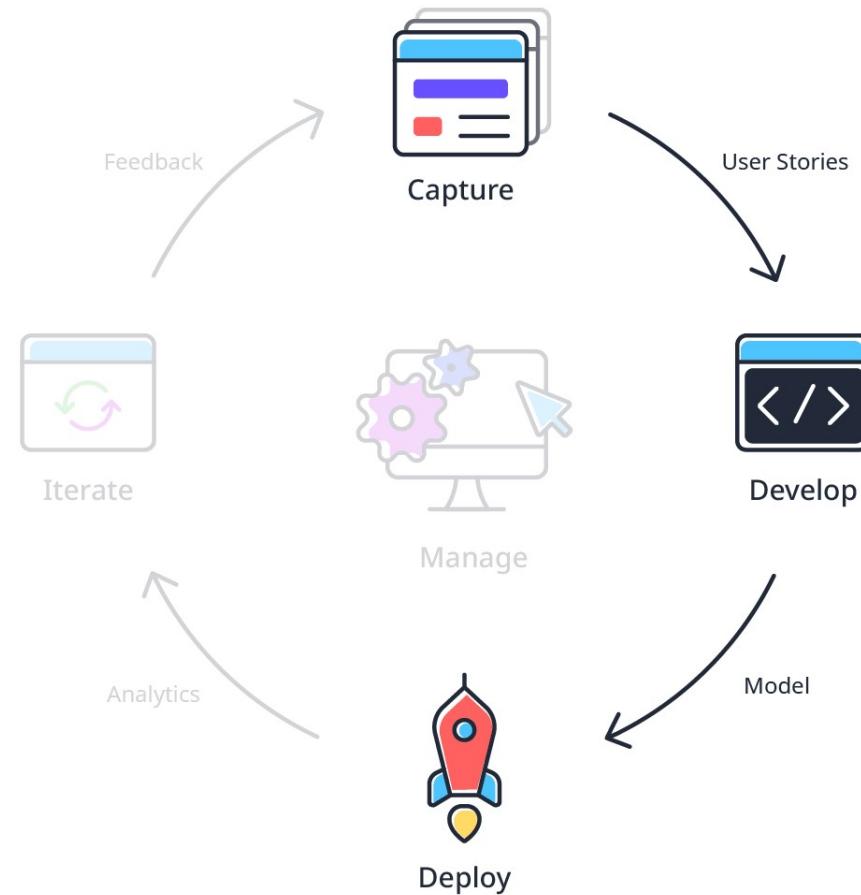


Create the Navigation Menu





Previewing your app



Objects

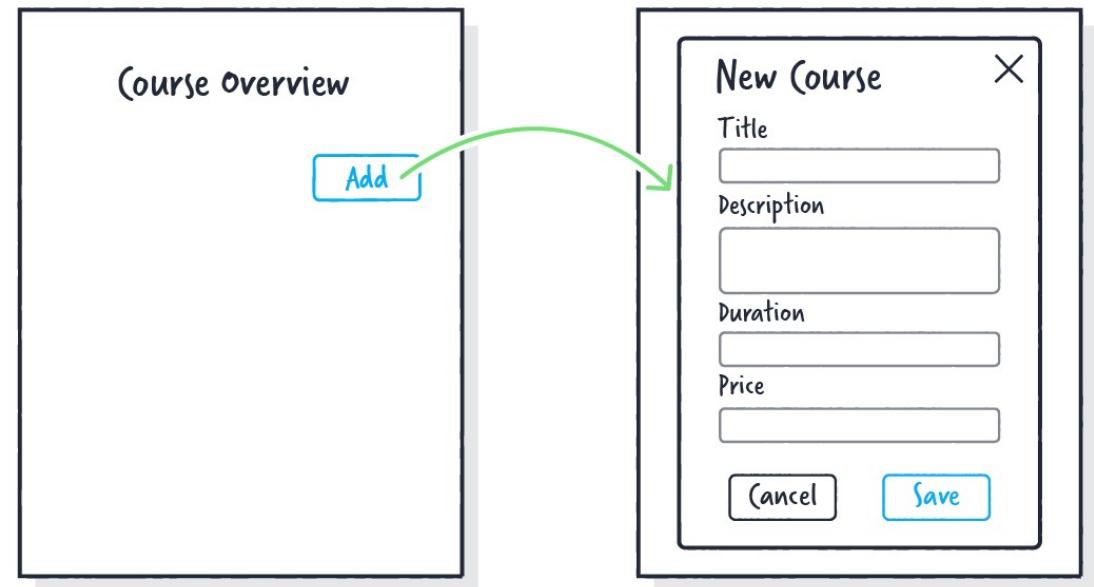
- Entities & attributes form a blueprint
- Objects are an instance of an entity

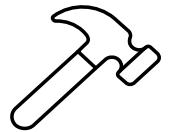




Solving the errors

- Error 1:
 - Link buttons to entities
- Error 2:
 - Create detail pages





Preview the app

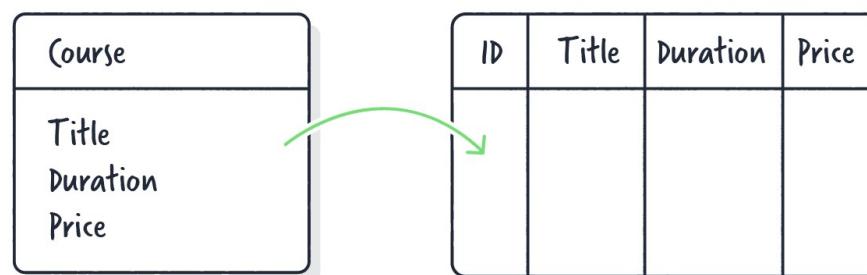
- Click Preview again
- Preview the app on mobile
- Set Story to Done!

The Domain Model & Database

The screenshot shows the Mendix RPA studio interface. On the left is a vertical toolbar with icons for file operations, preview, publish, and checks. The main workspace displays four entities: Course, Teacher, Location, and Trainee. Each entity has its properties listed:

- Course**: Title (String), Duration (String), Price (String), Description (String)
- Teacher**: Name (String), EmailAddress (String)
- Location**: Name (String), Address (String)
- Trainee**: Name (String), Address (String), EmailAddress (String)

The top right features a navigation bar with Preview, Publish, Checks, and a help icon. To the right of the entities is a sidebar titled "General" which includes a "Toolbox" tab and a "Properties" tab. A "Buzz" tab is also present. A "New Entity" button is located in the General section.



Developer creates entities

A database table is created based on the entities



User Story 2

As an administrator, I want to be able to schedule a training event at any time, so that the teachers can see their schedule even, from their phone

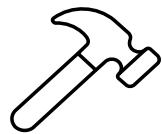


Extend the Domain Model

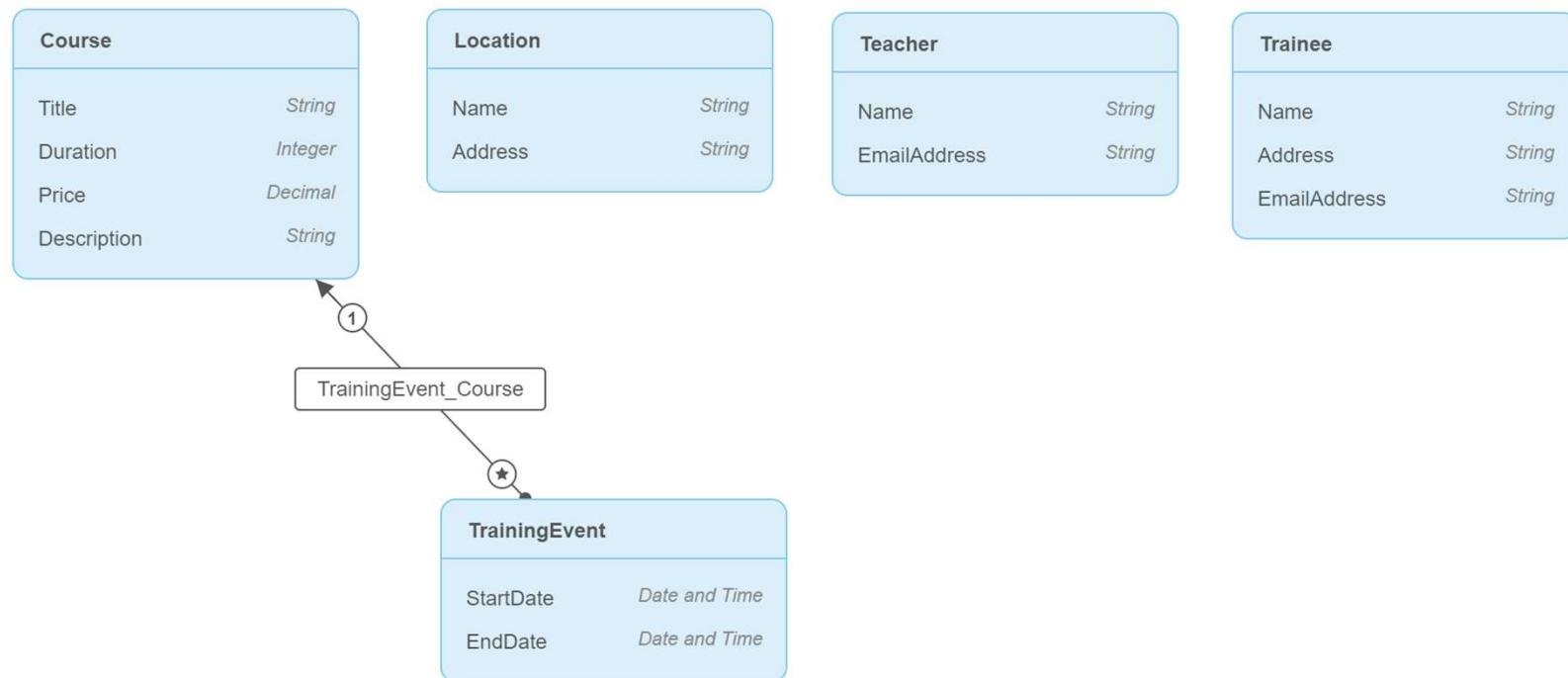
1. Add a new entity **TrainingEvent** to the Domain Model
2. Add attributes for start date and end date

Associations

- One-to-Many (1 - *)
- One-to-One (1 – 1)
- Reference Set (* - *)

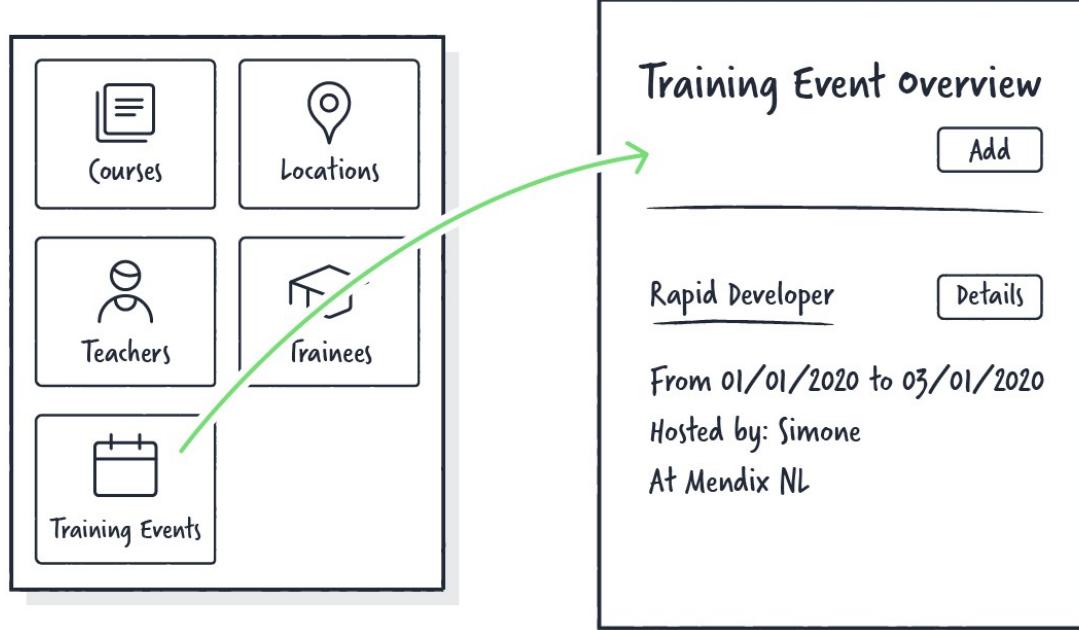


Add Associations





Using the Drop Down

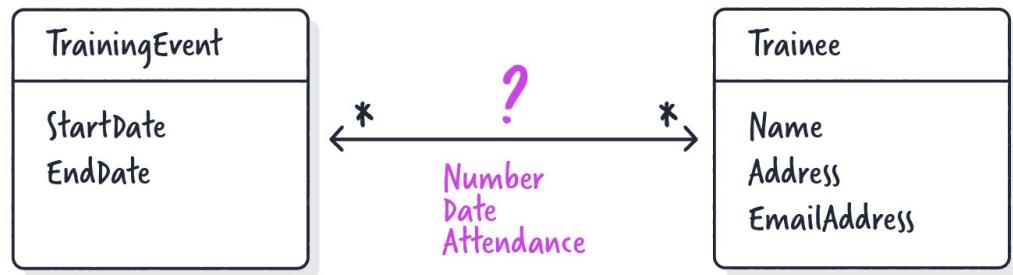




User Story 3

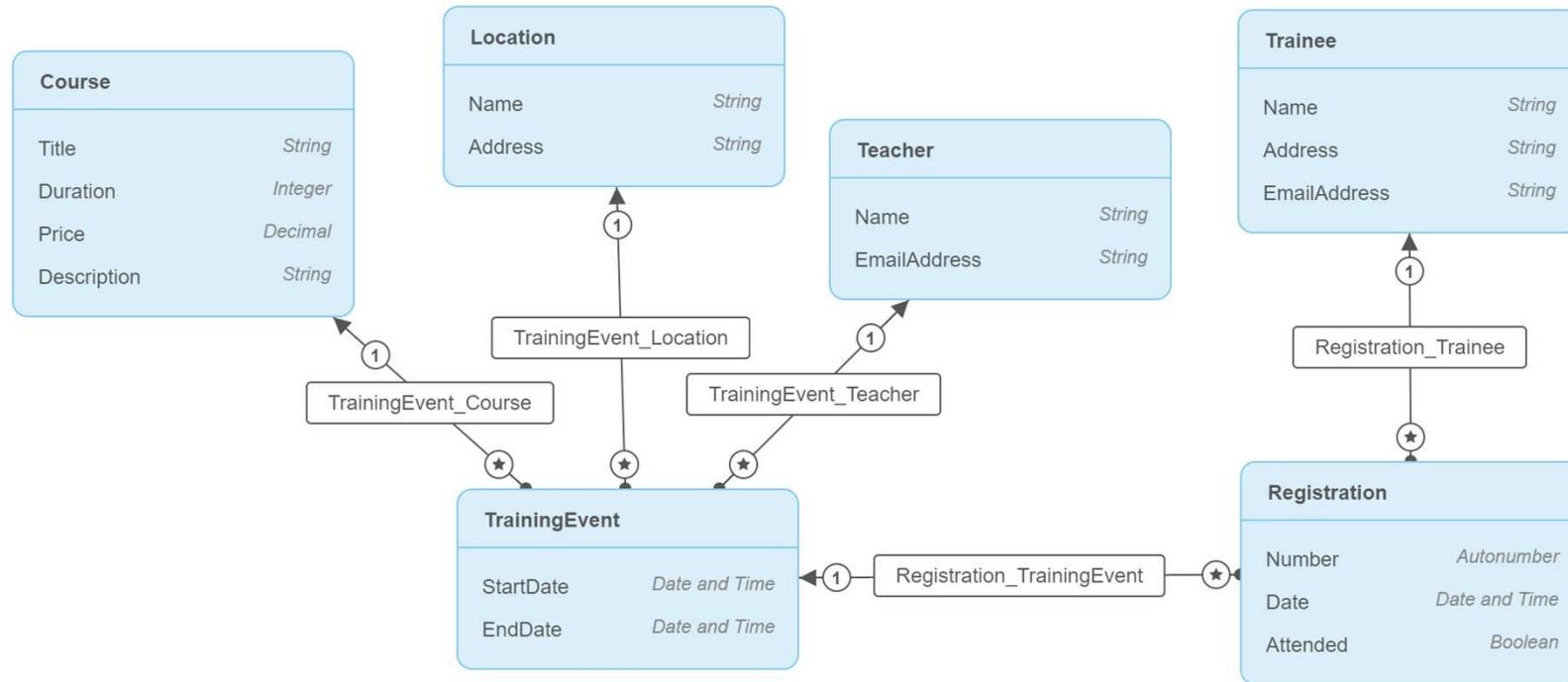
As an administrator, I want to be able to add registrations to a training event, so that my teachers know who their students will be.

Information Entity

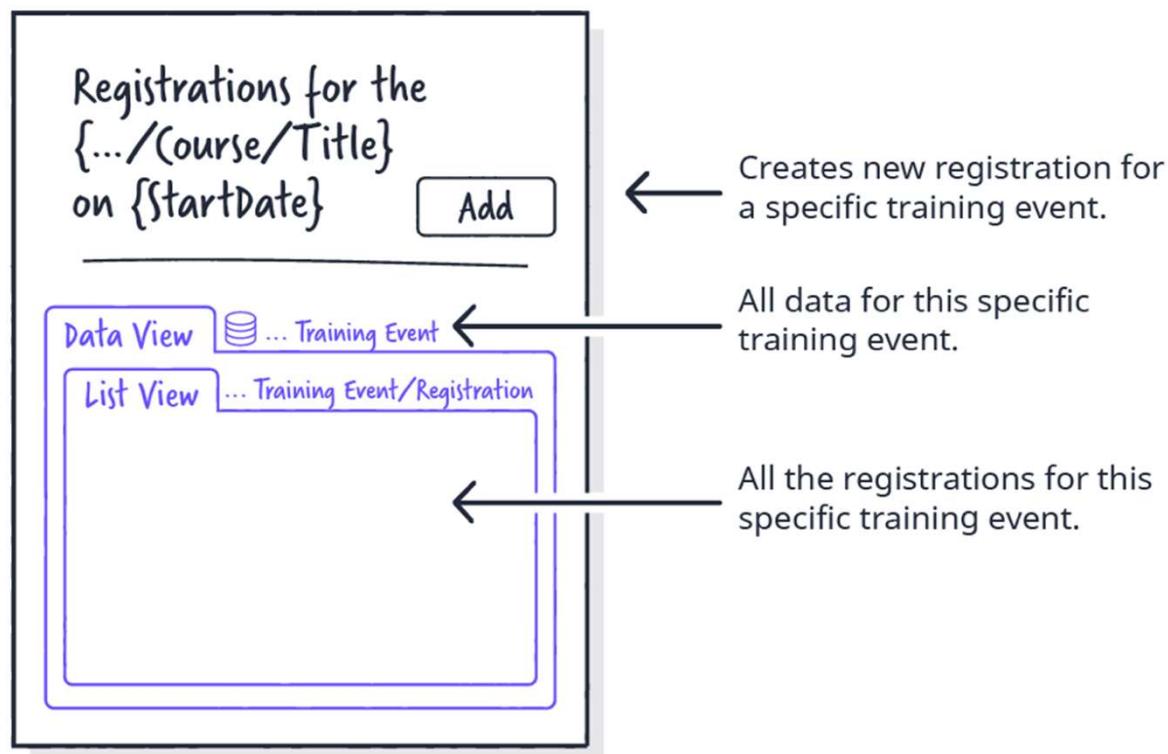




Extend the Domain Model



Nested Data





Create Registration Functionality

- Create a new button in the Training Event Overview page
- Create a new page for the overview with the **Blank** template of the registrations and link the button you just created to that page
- Add a **Data View** above your column and add **Pageheader Controls** building block to it.
- Remove the **Edit** and **Delete** button
- Add a **Data View** inside the column
- Add a **List 2** building block in the new **Data View**.
- Use the **Add** button to create a **Registration_NewEdit** page.



Preview & Finish up

The image shows a Mendix application interface. On the left, a list of registrations is displayed with a header: "Registrations for the {.../Course/Title} on {StartDate}". Below the header is a green "Add" button. The list contains five entries, each consisting of a number and a trainee name, followed by a blue chevron icon. At the bottom of the list is a "Load more..." button with a circular arrow icon. A red arrow points from the "Add" button towards the right side of the screen. On the right, a detailed view modal is open. It has fields for "Number" (empty), "Trainee" (a dropdown menu), "Date" (an input field with a calendar icon), and "Attended" (radio buttons for "Yes" and "No"). At the bottom of the modal are "Save" and "Cancel" buttons.

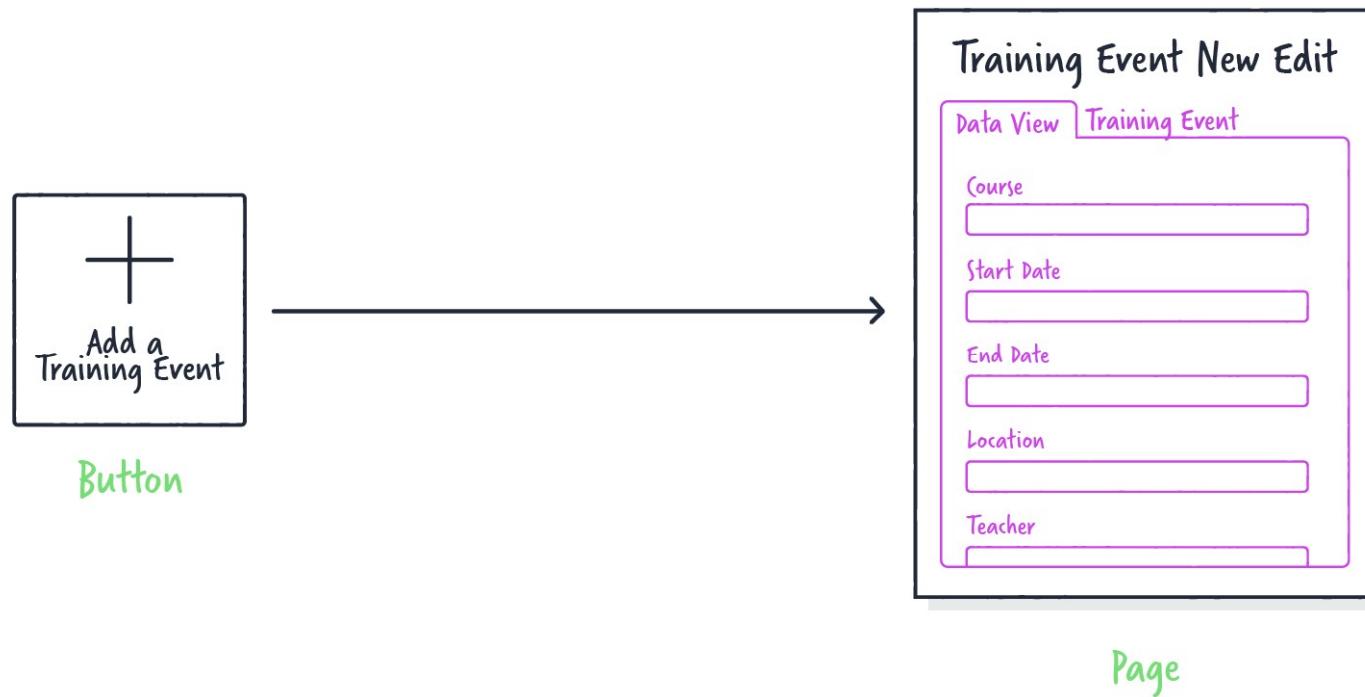


User Story 4

As an administrator, I want to be able to schedule a training event more efficiently, so that I spend as little time as possible on this.



Add a training event from the homepage



Knowledge checks

Go to kahoot.it

A list view is a widget used to:

- A. Display static text
- B. Display dynamic data
- C. Display bullet points
- D. Change text from horizontal to vertical view

The value 1,23 could be stored in an attribute of the type:

- A. AutoNumber
- B. Integer
- C. Decimal
- D. Long

The Attribute type Enumeration is used to store:

- A. A list of predefined values
- B. A positive or negative number
- C. A whole number that can only be positive
- D. Automatically generated positive or negative whole number

The reference selector is a widget that allows you to:

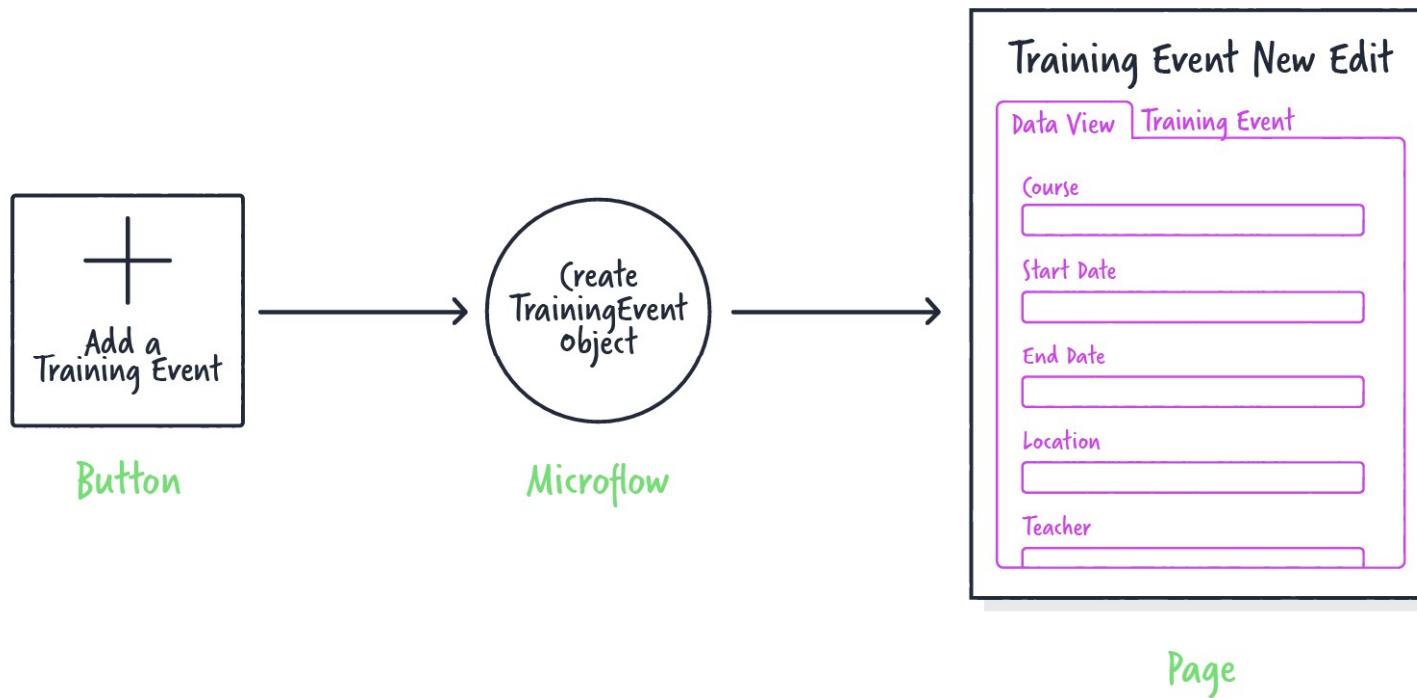
- A. Refer to another page within your app
- B. Select and display an associated object
- C. Display a drop-down menu
- D. Create an association between two entities

Make it automated

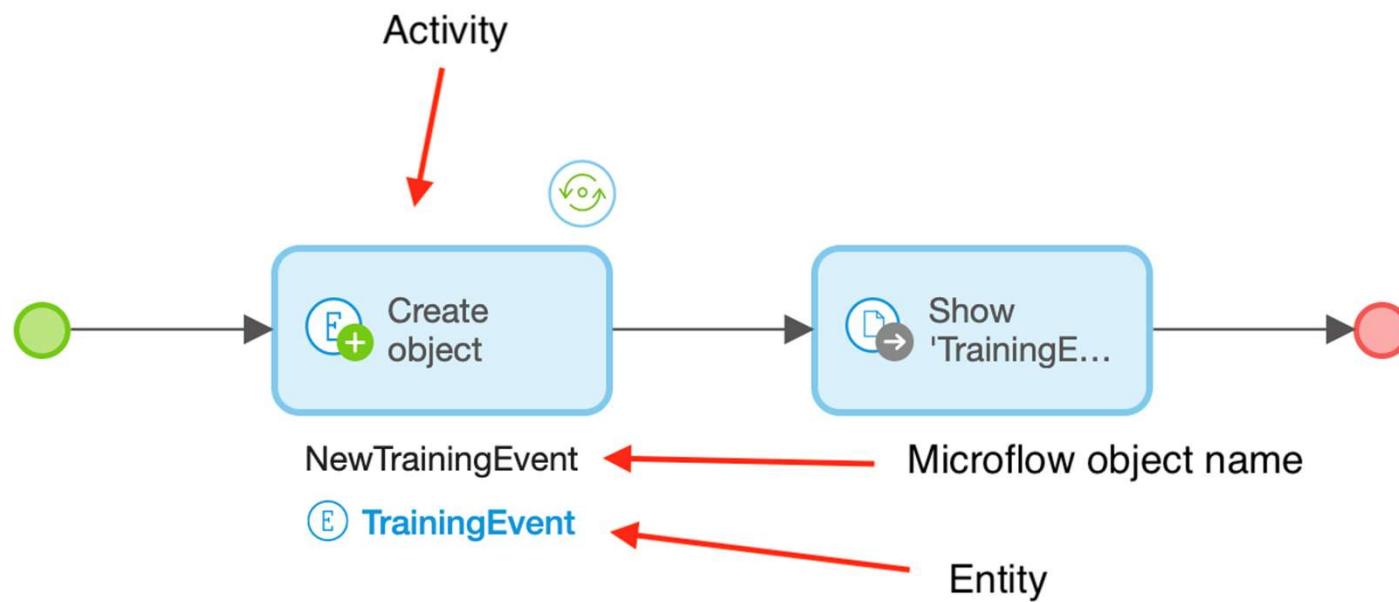
Introducing Microflows

- Microflows add logic to your app. Logic is used to make your app smarter, automate things, and make it maintainable.
- Use microflows to:
 - Extend or change default behavior
 - Handle business specific processes
 - Integrate with other systems, databases, web services, etc.

An example of a Microflow



Schedule Training Event from Home Page

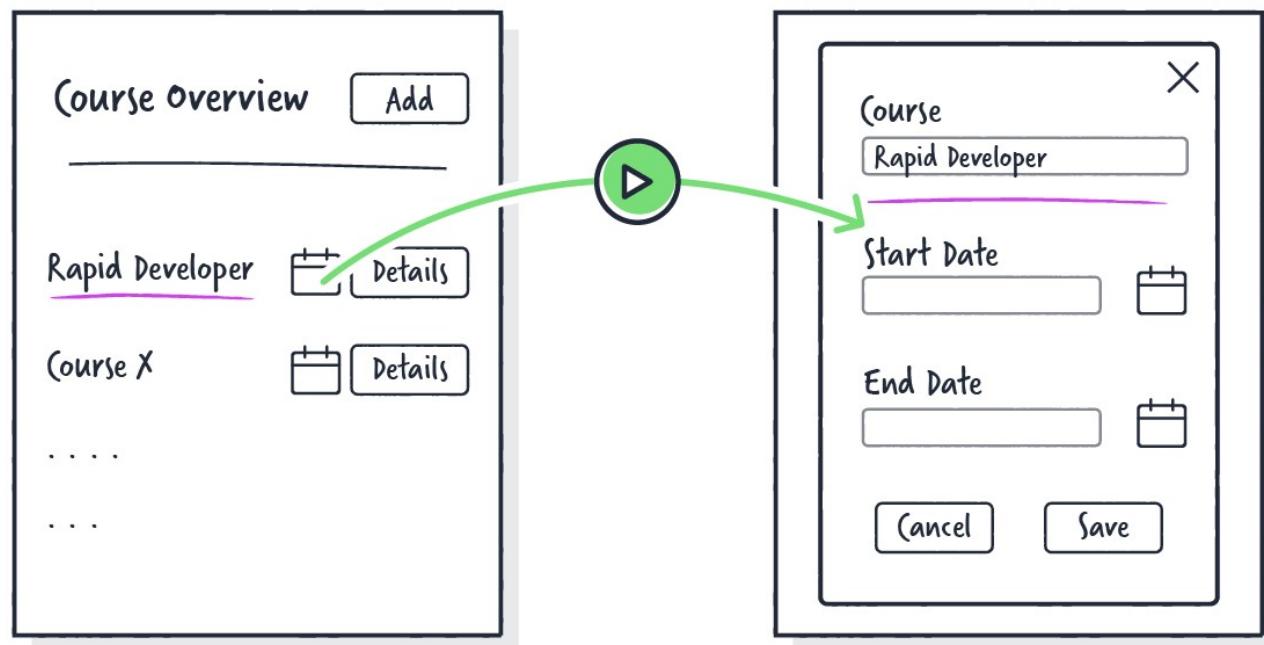


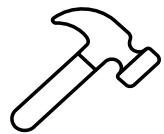
Elements of a Microflow

Element	Type	Graphic
Start Event	Event	
End Event	Event	
Sequence Flow	Flow	
Activity	Activity	
Decision	Decision	
Merge	Decision	
Parameter	Artifact	NewTrainer Trainer
Annotation	Artifact	Lorem ipsum dolor sit amet consectetur adipiscing elit.
Annotation Flow	Flow	



Schedule Training Event from Course Overview





Schedule TrainingEvent from Course Overview

Set initial value (X)

Need help with expressions? Go to our [documentation](#)

Select an Attribute or an Association (1)

TrainingEvent_Course (Course) (V)

Set with (1)

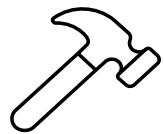
Variables / Attributes Constant Expression

Variables of type 'Course'

Search

Course Course (MyFirstModule)

Cancel Add

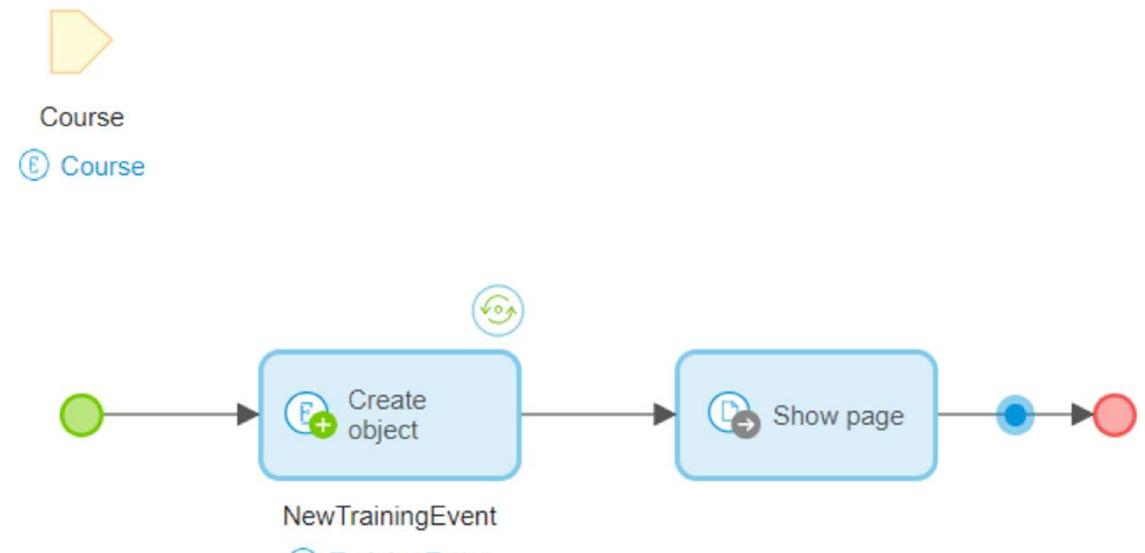


Schedule Course from Course Overview

Course overview
The complete LearnNow training collection

Add

{Title}	Button	Schedule	Details
Duration: {Duration} days			
Price: {Price}			
{Title}	Button	Schedule	Details
Duration: {Duration} days			
Price: {Price}			



Knowledge checks

Go to kahoot.it

What are microflows?

- A. Modeled custom behavior of a default button.
- B. The custom logic of a Mendix application.
- C. Small development processes.
- D. A way to describe the whole application process flow.

What are three microflow components?

- A. Exclusive merge, Parameter, Activity.
- B. Activity, Decision, Parameter.
- C. Activity, Inclusive split, parameter.
- D. Activity, Decision, Decision table.

How many start events can a microflow have?

- A. This depends on the trigger of the microflow
- B. Unlimited
- C. One
- D. This depends on the number of input parameters

Microflows can be triggered by:

- A. Entity event, Action button, Widget event
- B. Entity event, Action button, Container
- C. Widget event, Action button, Default button
- D. Default button, Navigation layout, Widget event

Make it w/ Mendix Studio Pro

Studio Pro

mx LearnNow Training Management (Main line) - Mendix Studio Pro 8.0.0 (BETA 3)

File Edit View Project Run Language Help

Run View 1

Project Explorer

- Project 'LearnNow Training Management'
- System
- MyFirstModule
 - Domain Model
 - Security
 - ACT_Course_ScheduleTrainingEvent
 - Course_NewEdit
 - Course_Overview
 - Home **2**
 - Images
 - Location_NewEdit
 - Location_Overview
 - Registration_NewEdit
 - Teacher_NewEdit
 - Teacher_Overview
 - Trainee_NewEdit
 - Trainee_Overview
 - TrainingEvent_NewEdit
 - TrainingEvent_Overview
 - TrainingEvent_Registration_Overview

Home [MyFirstModule] x

Atlas_Default > Home

Page Data view Data grid Template grid List view Add widget... Add building block... Structure mode Design mode

Feedback & Collaboration Widget

(Empty caption)

mx

LearnNow Training Management

Welcome to your new app

(Empty caption) Courses

(Empty caption) Locations

Stories **4**

Refresh Details Show completed stories Open document

Story

- As an administrator, I want to be able to easily access and manage my data, so I can run my company more efficiently.
- As an administrator, I want to be able to schedule a training event at any time, so that the teachers can see their schedule even from their phone.
- As an administrator, I want to be able to add registrations from my mobile phone, so that I can add registrations while traveling.
- As an administrator, I want to be able to schedule a training event more efficiently, so that I spend as little time as possible on this.

Status

Done Done Done Done

Properties Toolbox Connector

Page 'MyFirstModule.Home'

Common Name Home Documentation Class page-dashboards page-class Style

Designer Canvas width 1200 Canvas height 600

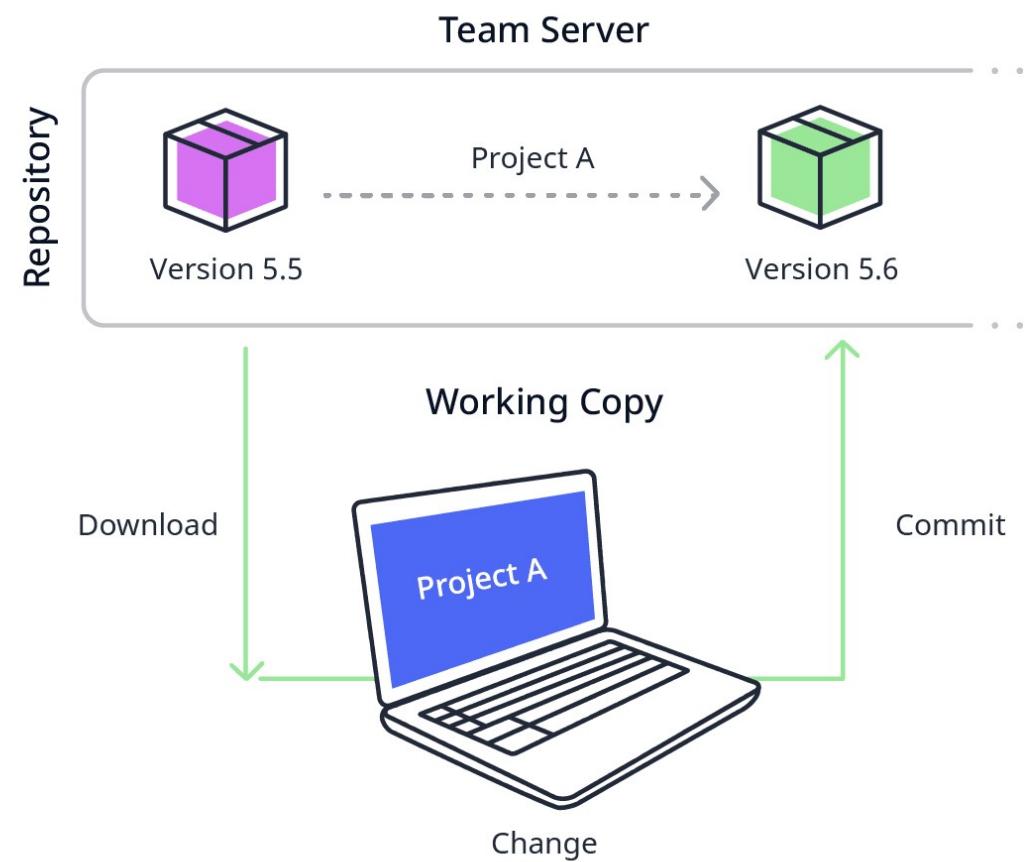
General Platform Web Layout type Responsive Layout Atlas_Default (Atlas_UI) Title Homepage URL

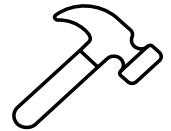
Navigation Visible for User, Administrator

Usage Mark as used No

Properties Toolbox Connector

Team Server





Open the app in Studio Pro

- Open the latest version of Studio Pro
- Find your app
- Open the mainline

Status and Changes

Icon	Meaning
○	This item has not been changed.
●	You modified this item (meaning, a document, folder, or module).
✚	You added this item.
🕒	You moved this item to another position in the project tree.
✖	You deleted this item.
❗	You and somebody else made conflicting changes to this item

Committing

- Sending changes to the repository is called committing.
- Commit small, consistent pieces of work to the repository.
- Studio Pro automatically checks your app for things which you may have missed and reminds you to check and fix these before committing.
- Committing is only possible when your working copy is up to date with the repository.
- Don't forget to set the status of the story!

Knowledge checks

Go to kahoot.it

Studio Pro is a WYSIWYG editor.

- A. True
- B. False

In Studio Pro, you can access the Domain Model of your app from:

- A. The Project Dashboard
- B. The Connector
- C. The Project Explorer
- D. The Domain Model tab

Only users with the SCRUM Master role have access to the Team Server.

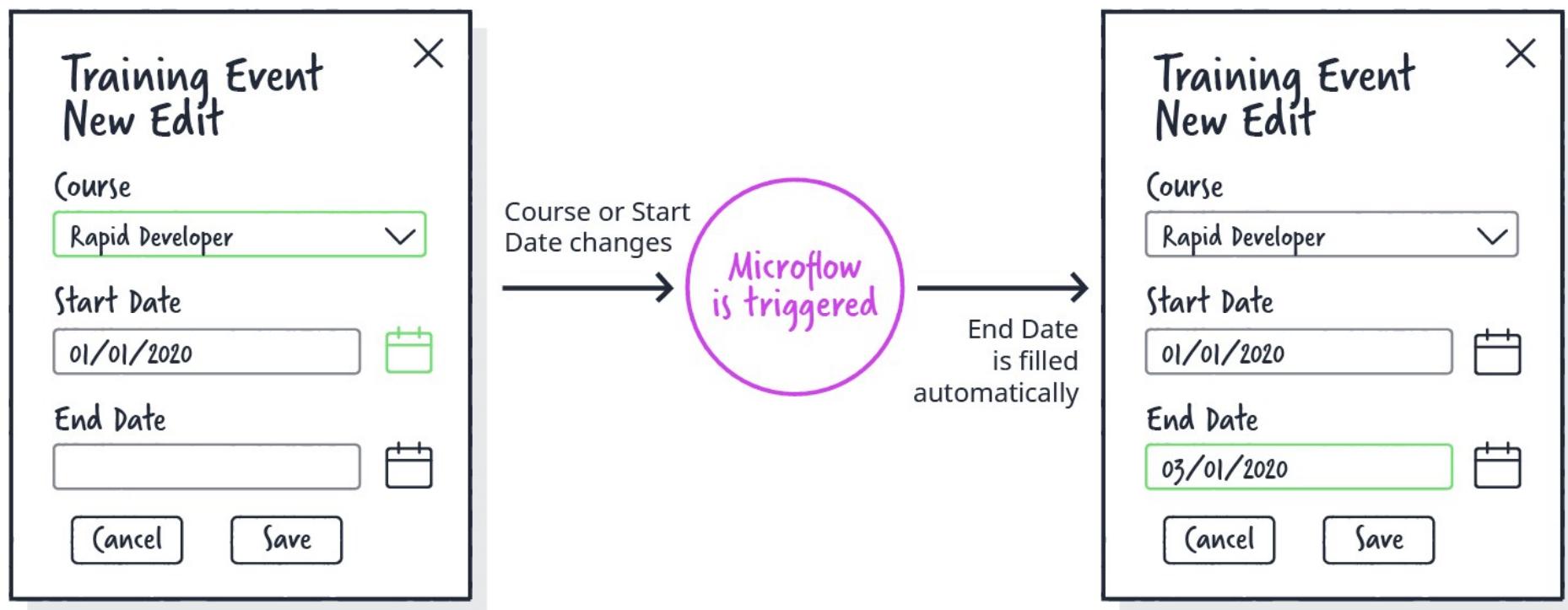
- A. True
- B. False

You downloaded the latest version of the project from the Team Server, and did some changes to the app. What do you need to do next for your team members to be able to view your changes?

- A. Commit your changes to the Team Server
- B. Update the user story from Running to Done
- C. Synchronize with the Team Server
- D. Publish your app to the cloud

Make it smart

Automatically Fill Out End Date





5 Steps

1. Trigger the Microflow
2. Fill out Calculated End Date
3. Deploy and Test
4. Analyze Errors and Adjust Microflow
5. Commit your Work



Triggering a Microflow from an Input Widget

- **On enter:** when the user enters (clicks on) the input widget
- **On change:** when the user leaves the input widget after making a change
- **On leave:** when the user leaves (closes) the input widget (no matter whether they changed the value of the widget or not)

The screenshot shows a modal dialog titled "Training Event New Edit". It contains three input fields: "Course" with the value "Rapid Developer", "Start Date" with the value "01/01/2020", and "End Date" which is empty. Below the form are two buttons: "Cancel" and "Save".

Microflow expressions

Element	Example
Functions	FunctionName (Ingredient 1, Ingredient 2)
Variables	\$Trainee/EmailAddress
Tokens	[%CurrentDateTime%]

General Expressions:

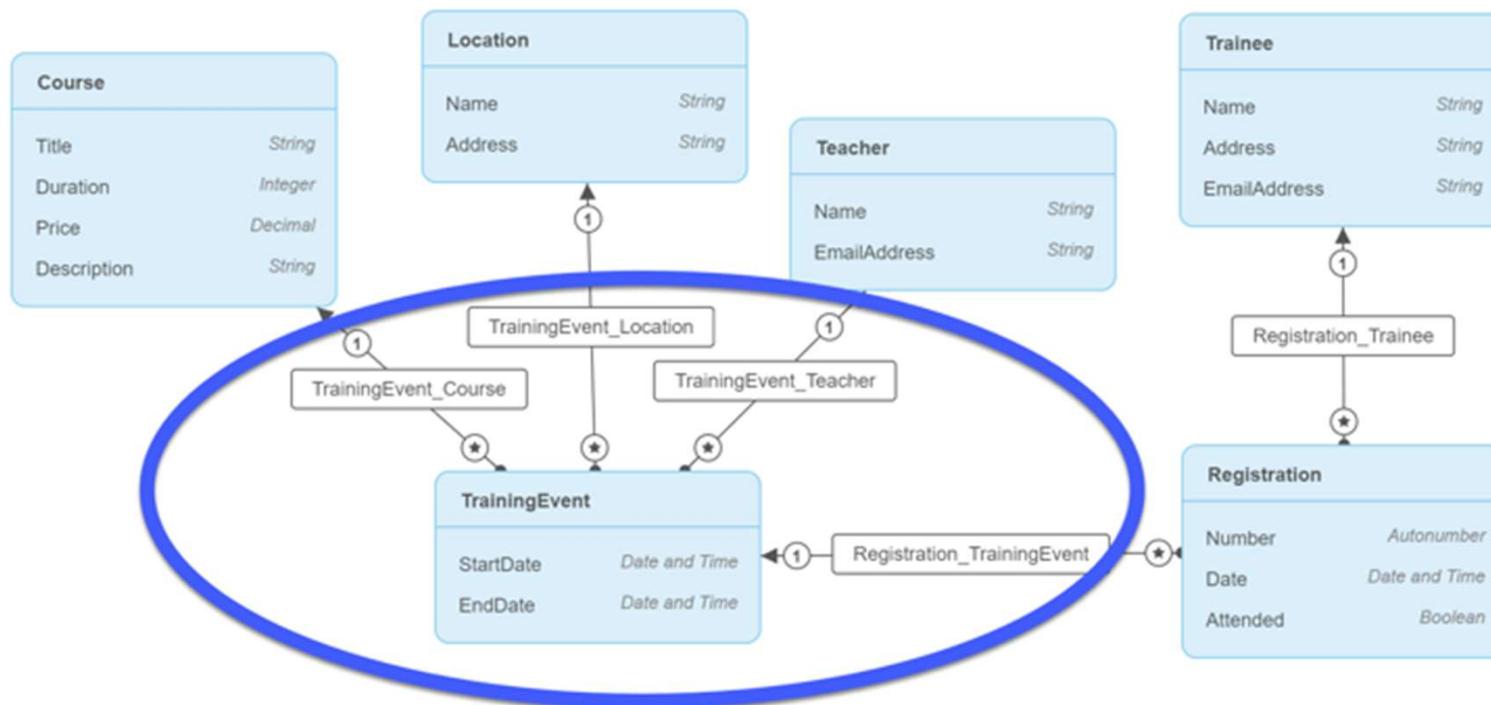
Type	Expression
Arithmetic	* : + -
Relational	< > <= >= !=
Special checks	empty isNew
Boolean	and or not
If expressions	If then else



Build the Microflow

1. Retrieve associated Course
2. Calculate the EndDate
 - `addDays(DateTime, Integer)`
 - DateTime = StartDate (TrainingEvent)
 - Integer = Duration (Course)
3. Set the newly calculated EndDate
 - Change Object activity, change the TrainingEvent
 - Commit: No
 - Refresh client: Yes

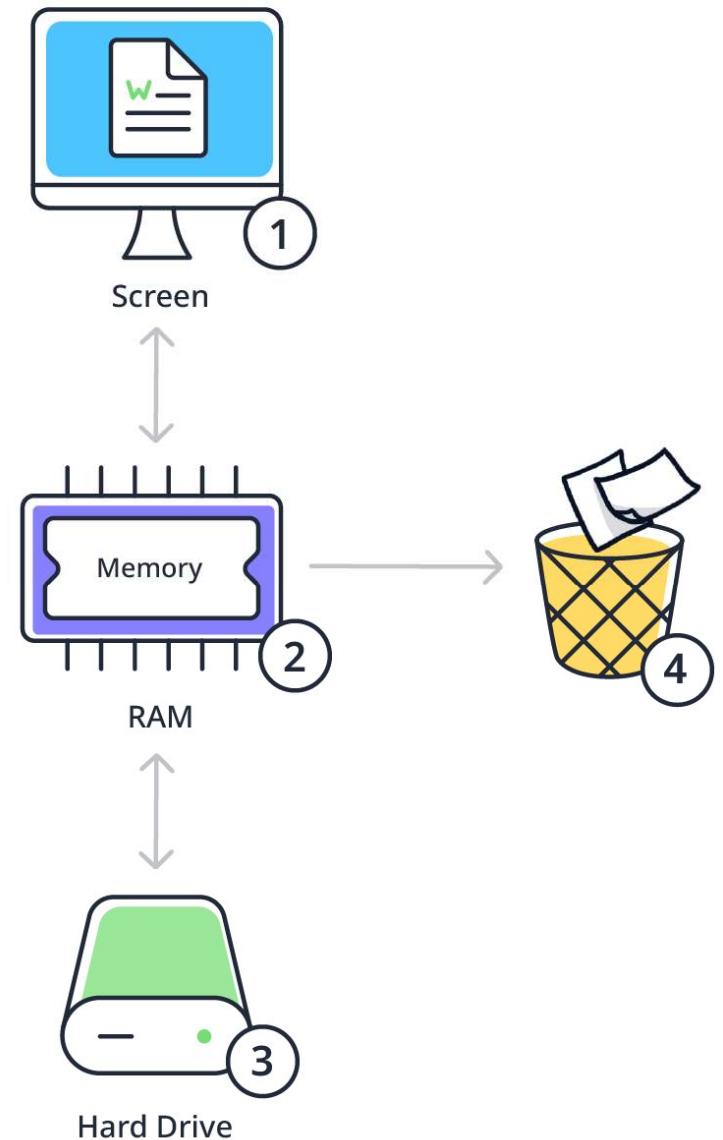
In Scope of the Microflow



Retrieving Data

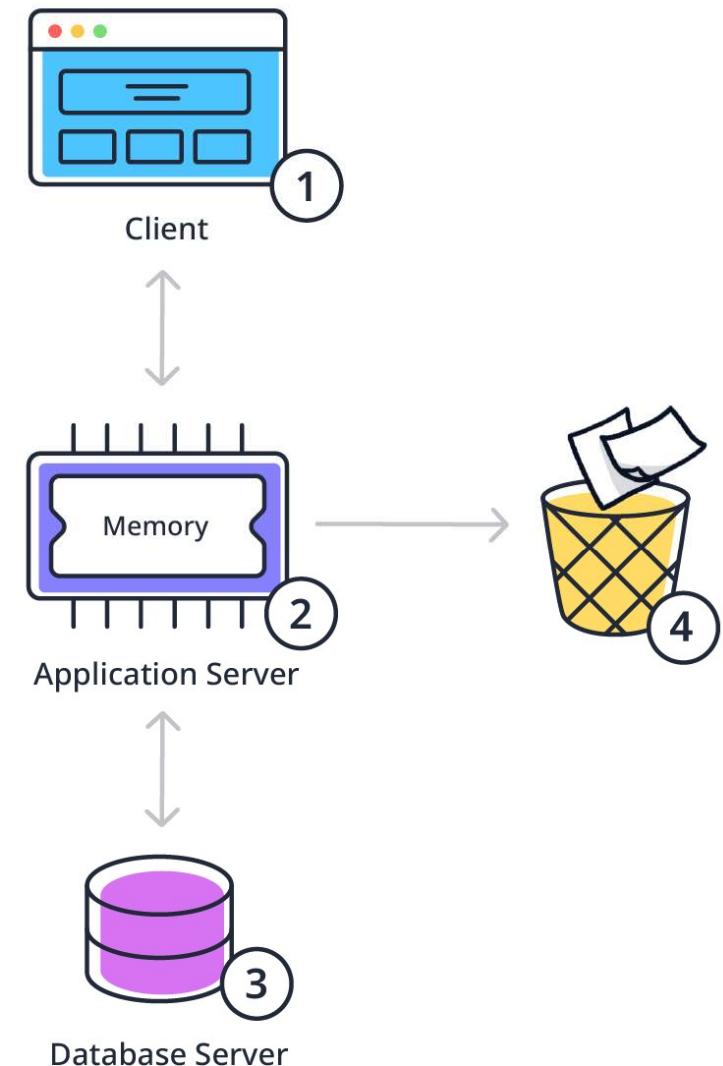
Example:

When writing a text document



Retrieving Data

When using Mendix



By Association Retrieve

Doing a retrieve from memory is called "By Association Retrieve".

Benefits:

- Faster (no connection to the database is needed)
- Information not in the database yet

Transient objects





Complete the microflow

- 1) Retrieve your data
- 2) Complete the microflow expression
- 3) Run Locally and Crash!

The screenshot shows two overlapping dialog boxes in the Mendix Studio interface.

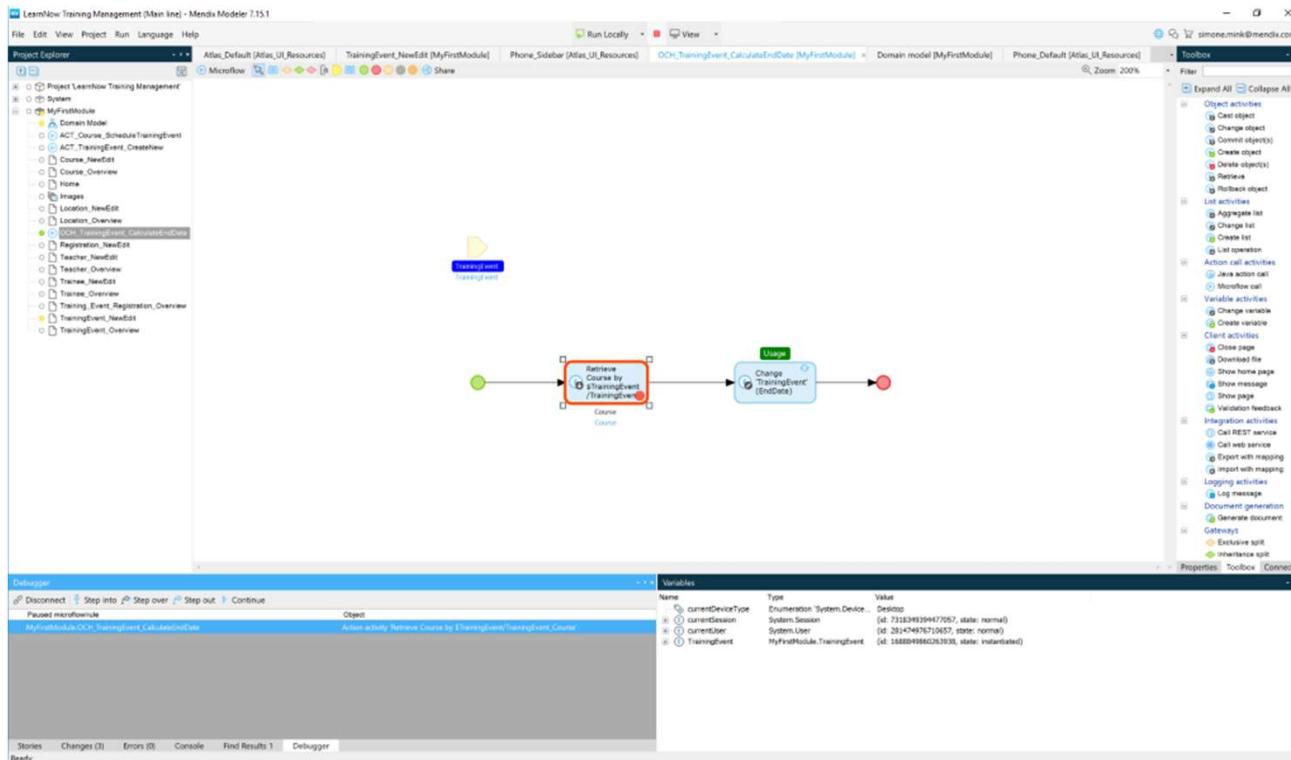
The top dialog is titled "Select Association". It contains a tree view of variables under the "Variables" category. The "TrainingEvent_Course" variable is selected, indicated by a blue border around its node. Other visible nodes include "Registration_TrainingEvent", "TrainingEvent_Location", "TrainingEvent_Teacher", "currentSession", "currentUser", "latestError", "latestHttpResponse", and "latestSoapFault".

The bottom dialog is titled "Edit Change Item". It has fields for "Member" (set to "EndDate (Date and time)"), "Type" (set to "Set"), and a "Value" field containing the expression "addDays(\$TrainingEvent/StartDate, \$Course/Duration)". There is a "Generate" button next to the value field. At the bottom right of this dialog are "Select", "None", and "Cancel" buttons.



Analyze Errors

Add breakpoint on the OCH_TrainingEvent_CalculateEndDate microflow





Use Decisions

Add two Decisions to check if the start date and course are selected.

The screenshot shows the Mendix development interface. On the left, the Project Explorer displays the project structure under 'MyFirstModule'. A central window shows an 'Exclusive Split' configuration with a caption 'Course selected?' and an expression '\$Course != empty'. Below this is a table for managing splits. To the right, a process diagram illustrates the logic:

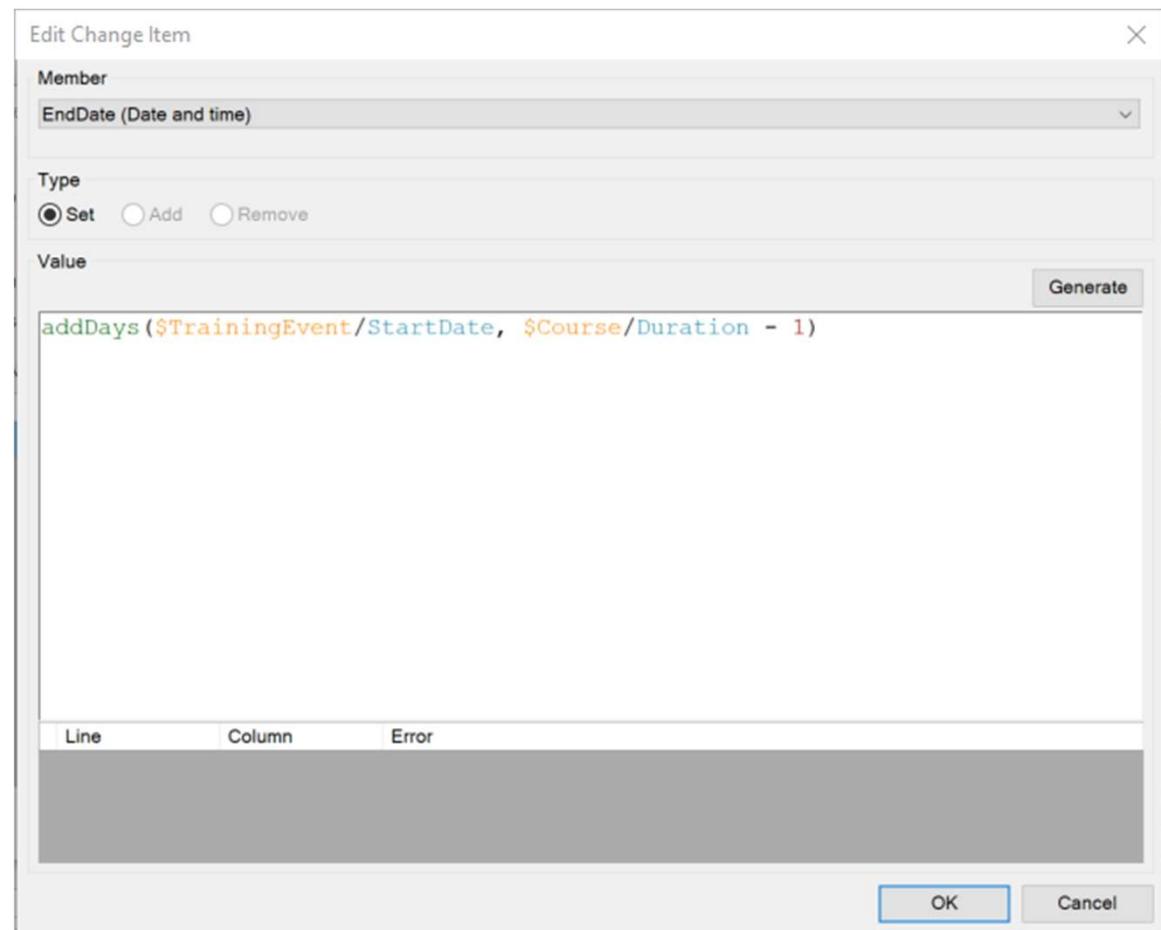
```
graph LR; Start(( )) --> Retrieve[Retrieve Course by $TrainingEvent /TrainingEvent]; Retrieve -- Course --> StartDate{Start date selected?}; StartDate -- true --> CourseSelected{Course selected?}; StartDate -- false --> End(( )); CourseSelected -- true --> Change[Change 'TrainingEvent' (EndDate)]; CourseSelected -- false --> End;
```

The process starts with a green initial state, followed by a retrieve step that sets the 'Course' variable. It then branches into two decisions: 'Start date selected?' and 'Course selected?'. If either decision is false, the process ends. If both are true, it proceeds to a 'Change' step that updates the 'TrainingEvent' with the 'EndDate' before concluding.



Finish microflow and commit

- 1) Remove breakpoint
- 2) Run Locally
- 3) Find bug & fix
- 4) Commit





User Story 5

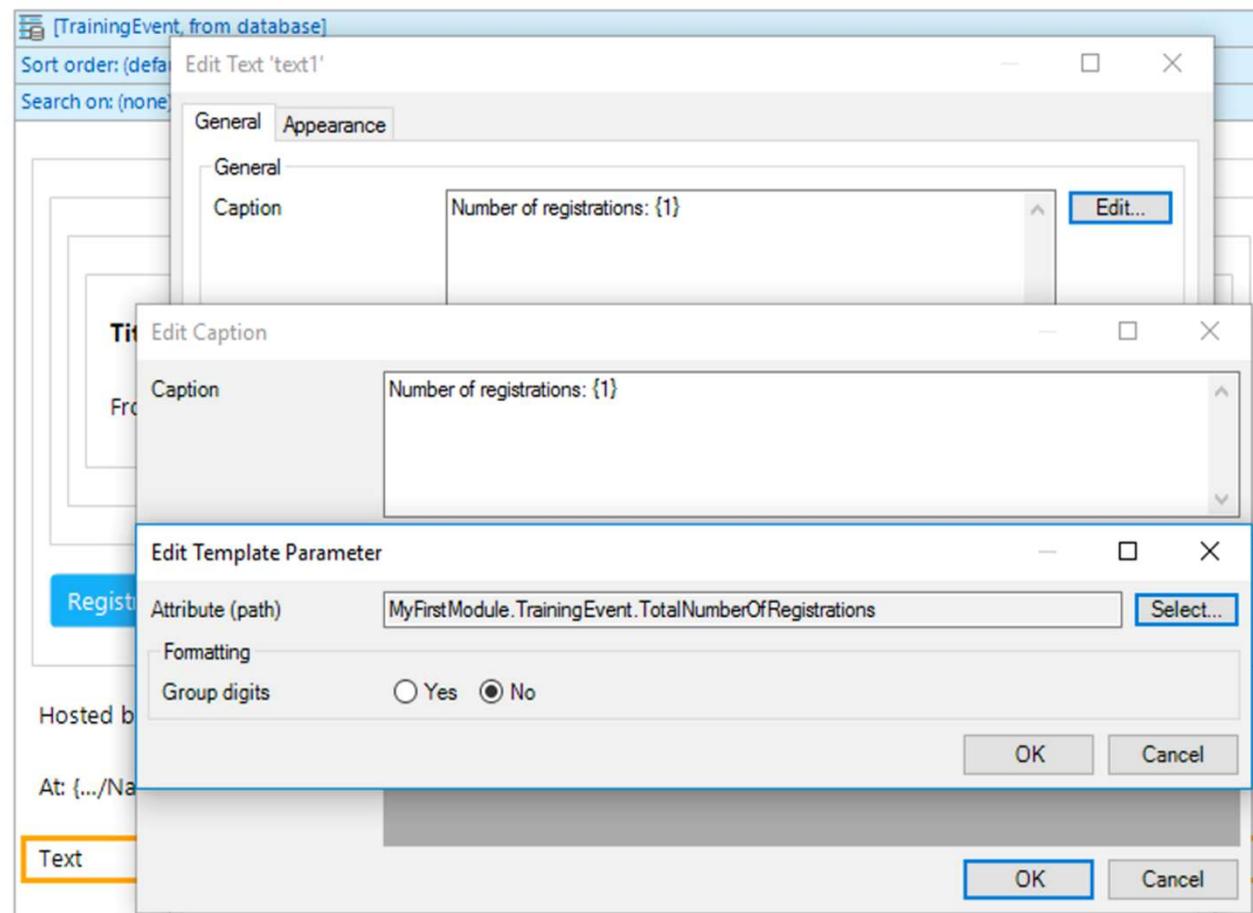
As a teacher, I want to be able to see the number of trainees attending a training event at any time, so that I know what resources I need.



Add a New attribute

Stored or Calculated
Attribute?

- 1) New attribute
- 2) Text widget
- 3) Parameter
- 4) Edit caption





Add Object Event Handlers

Prefixes for object event handlers:

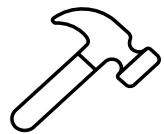
	Before	After
Create	BCR	ACR
Commit	BCO	ACO
Rollback	BRO	ARO
Delete	BDE	ADE

In our case: ACO_ADE_Registration_SetTotalNumberOfRegistrations.



Set the total number of Registrations

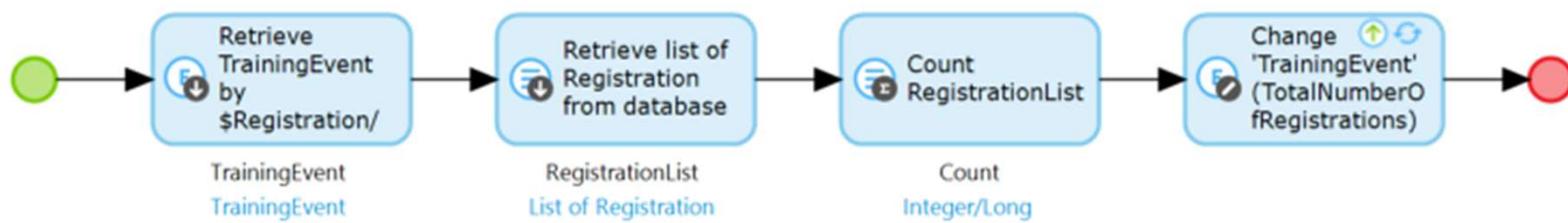
1. Retrieve the associated TrainingEvent
2. Retrieve the Registrations that belong to the TrainingEvent
3. Count the list of Registrations
4. Set the total number of Registrations as the new value
 - Change Object activity, change the TrainingEvent
 - Commit: Yes
 - Refresh client: Yes



Set the total number of Registrations



Registration
Registration



Knowledge checks

Go to kahoot.it

When do you use in the retrieve action the option “by association”?

- A. Always when you want to retrieve an associated object.
- B. When you want to retrieve the associated object from memory.
- C. Only when you want to retrieve an associated list.
- D. When you want to retrieve the association of an object.

Which statement is true?

- A. Microflow expressions are used to change, check and extract data from available values.
- B. Microflow expressions are used to express the flow of a microflow.
- C. Microflow expressions are used to define a query to the database.
- D. Microflow expressions are used to document the microflow actions.

Which activity is used to change the value of an attribute?

- A. Change variable
- B. Change object
- C. Change attribute
- D. Change value

Make it valid & consistent

Why is valid and consistent data important?

What can go wrong?	How can you prevent it?
Empty record	Validation Rules
Invalid data	Regular Expressions
Important data is deleted	Prevention of Delete
Data becomes meaningless	Cascading Delete

Validation rules

Validation rules are conditions that should be met before an object is stored in the database.

You can add validation rules to:

- The Domain Model
- Microflows
- Pages

Types of validation rules

Type	Description	Example
Required	The attribute cannot be empty.	The description of a course
Unique	The attribute should have a value that is unique.	The title of a course
Equals	The attribute value needs to be equal to a specified value.	New password
Range	The attribute value needs to be in a range between specified values.	The duration of a course
Regular expression	The attribute needs to match a regular expression. A regular expression uses pattern recognition to check values.	The email address (user@something.com)
Maximum length	The attribute may have no more than the specified number of characters.	A zip code

What happens when an Object is not Valid?

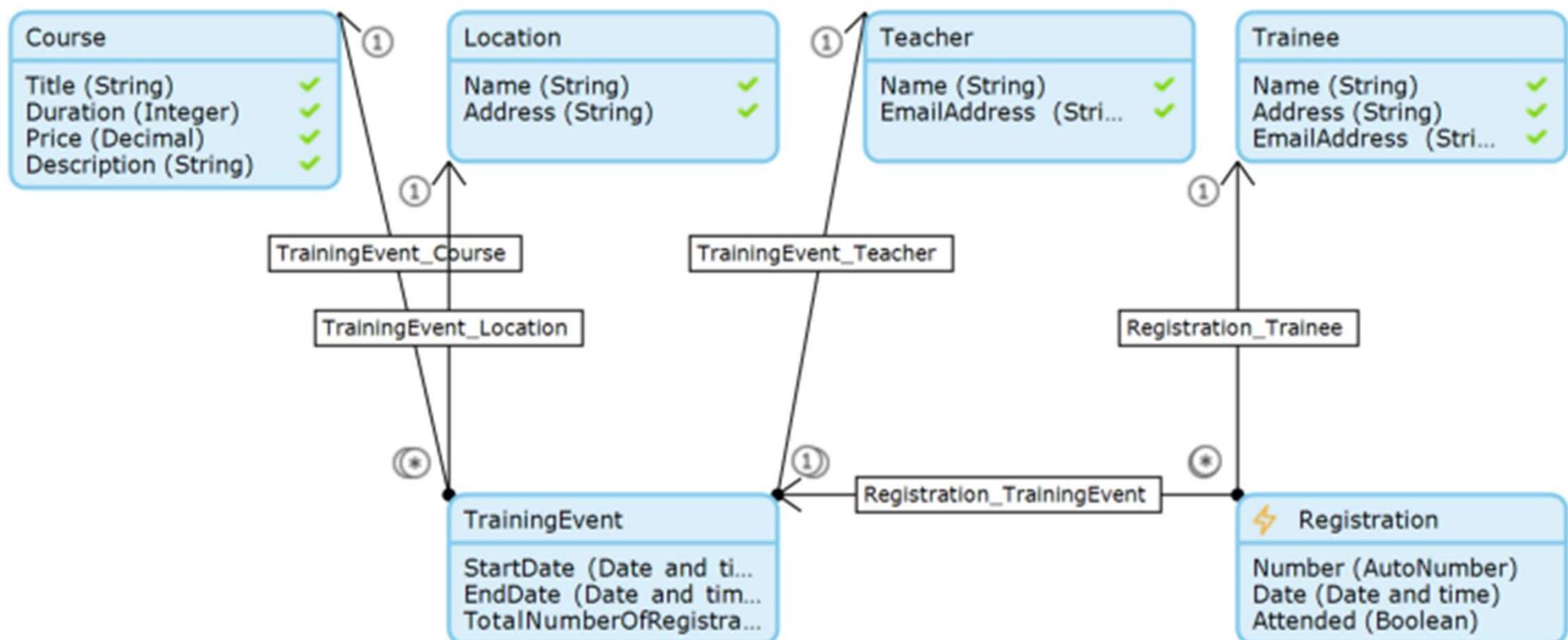
Where was the validation rule triggered?	What will appear?
Page (input widget)	Error message below the input widget
Page (no input widget)	Pop-up with error message
System	Error message in the log



User Story 6

As an administrator, I want data to be valid and consistent,
so my database doesn't become messy.

The Domain Model





Add validation rules to course and location

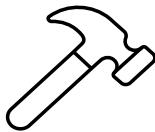
Entity	Attribute	Validation rule
Course	Title	Required, Unique
	Duration	Required, ≥ 1 and ≤ 10
	Price	Required, ≥ 300
	Description	Required
Location	Name	Required, Unique
	Address	Required



Add validation rules to teacher and trainee

Search for a regular expression (RegEx)

Entity	Attribute	Validation rule
Teacher	Name	Required
	EmailAddress	Required, email format
Trainee	Name	Required
	Address	Required
	EmailAddress	Required, email format



Validation rules in Microflows

TrainingEvent NewEdit

Course
Please select a course.

Start date
mm/dd/yyyy
Please select a start date.

End date
mm/dd/yyyy

Location
Please select a location.

Teacher
Please select a teacher.

Save **Cancel**

This screenshot shows a Mendix form titled "TrainingEvent NewEdit". It contains four required fields: "Course", "Start date", "Location", and "Teacher". Each field has a red validation message below it: "Please select a course.", "Please select a start date.", "Please select a location.", and "Please select a teacher.". At the bottom, there are "Save" and "Cancel" buttons.

Entity	Member	Validation Rule
TrainingEvent	StartDate	Required
	Teacher selection	Required
	Course selection	Required
	Location selection	Required

1. Change Save button to Microflow button
2. Mimic default save behavior
3. Create all validation checks
4. Create **validation feedback** messages per field
5. Get all feedback to user at once

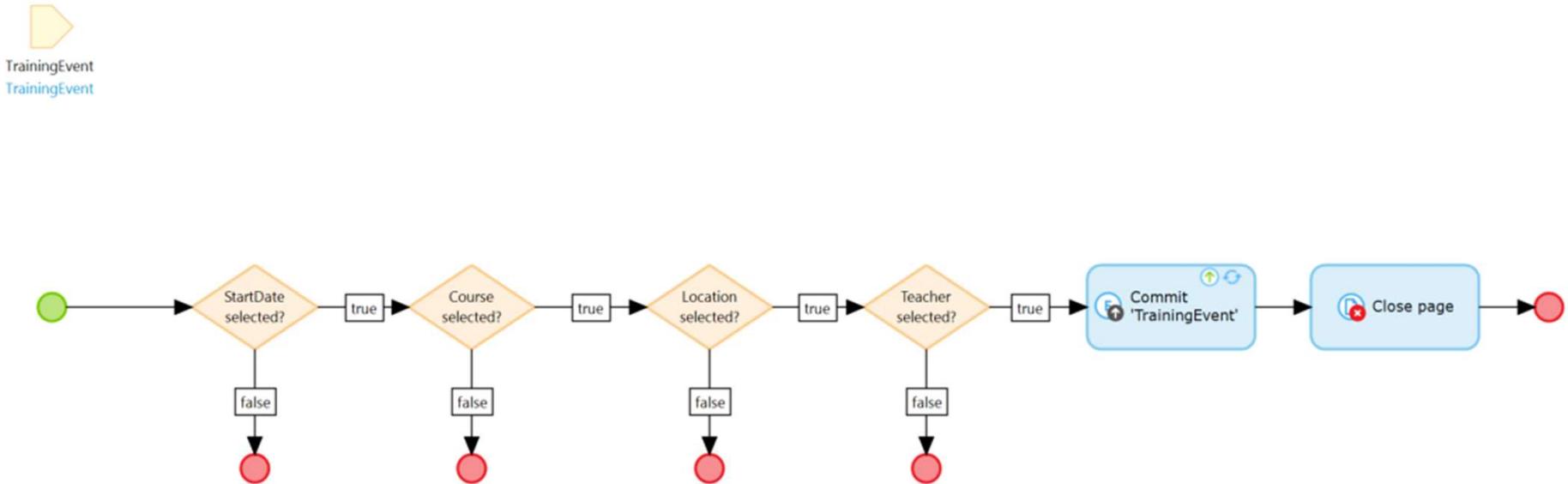
Step 1 & 2: Create basic microflow

Make sure that the Save button triggers the validation microflow:

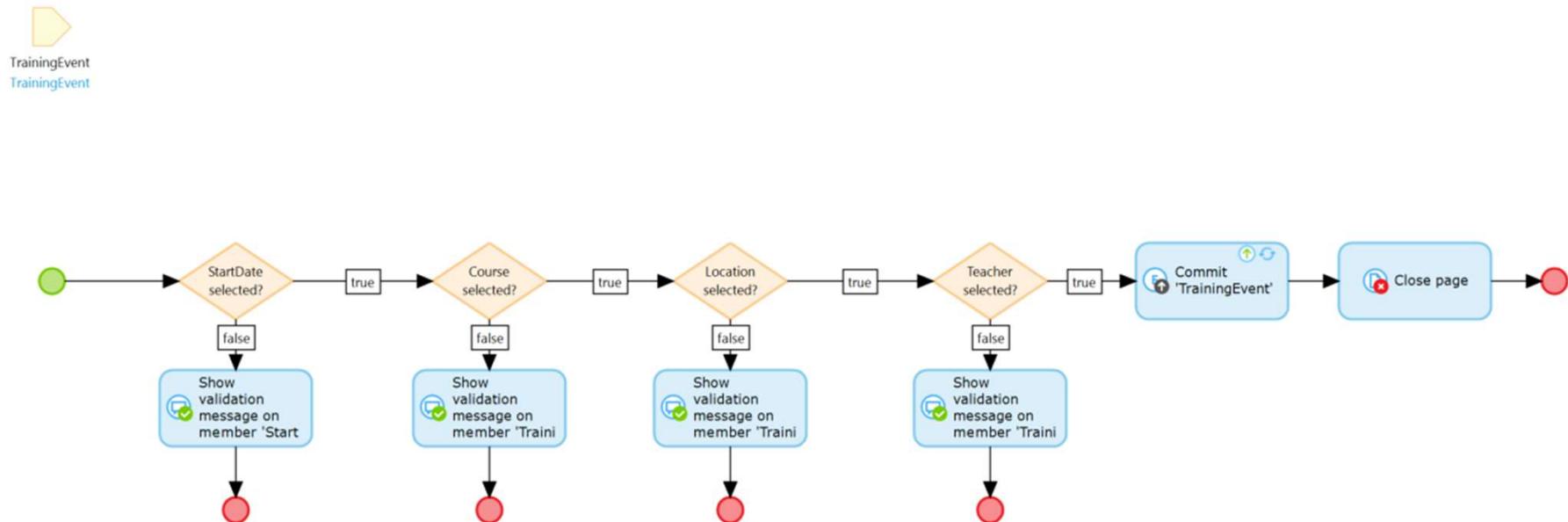
ACT_TrainingEvent_Save



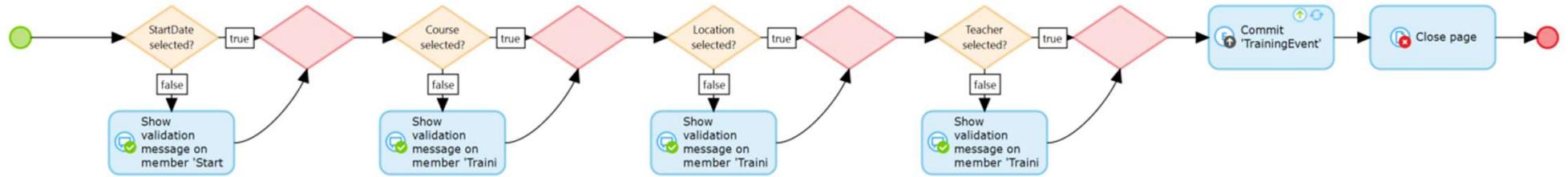
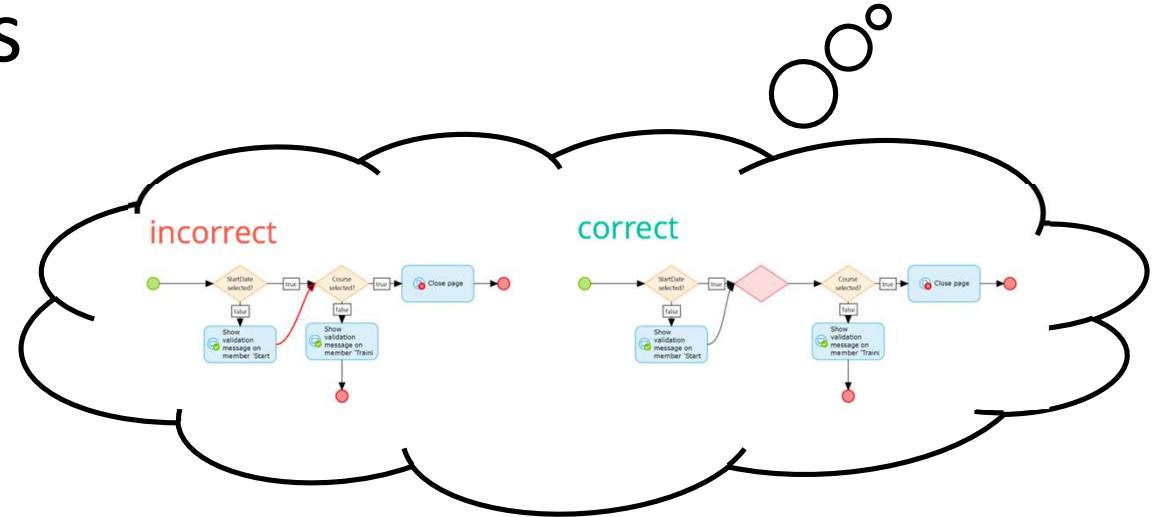
Step 3: Build Validation Checks



Step 4: Add feedback messages



Step 5: Merge Decisions

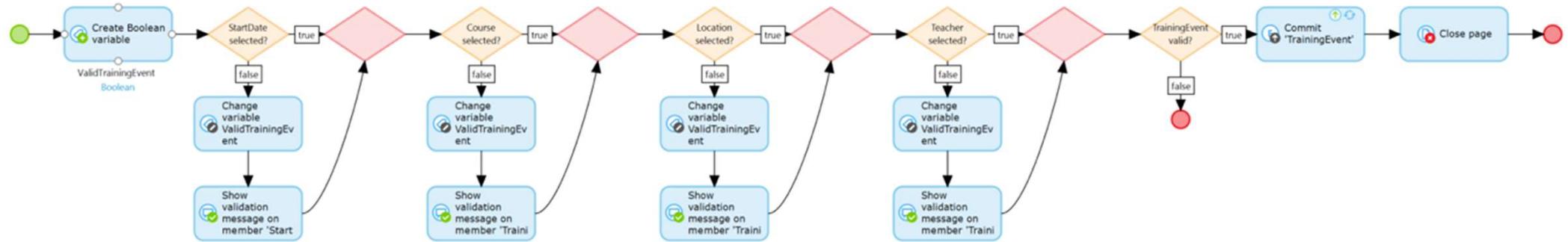


Still step 5: Add flags



TrainingEvent

TrainingEvent

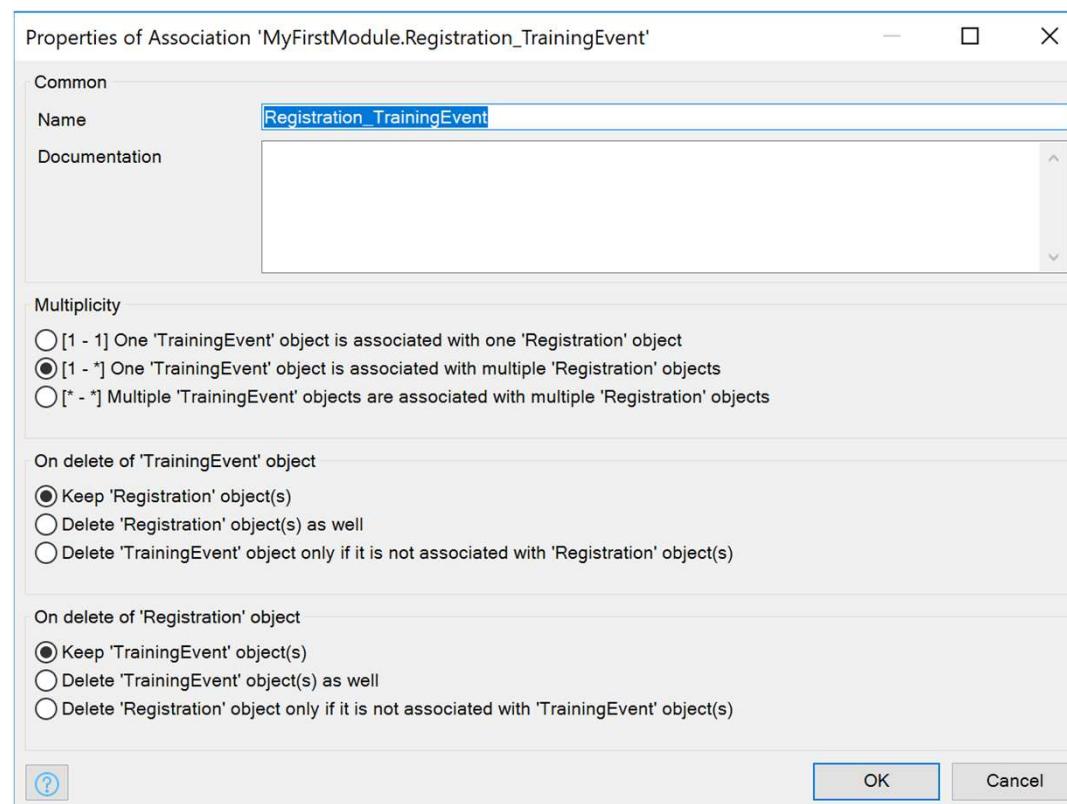




User Story 7

As an administrator, I want to be able to delete training events that don't have registrations, so I can't accidentally delete a training event that people have already paid for to attend.

Prevention of Delete





Prevent delete

Step 1: Add delete button



Step 2: Add delete behavior

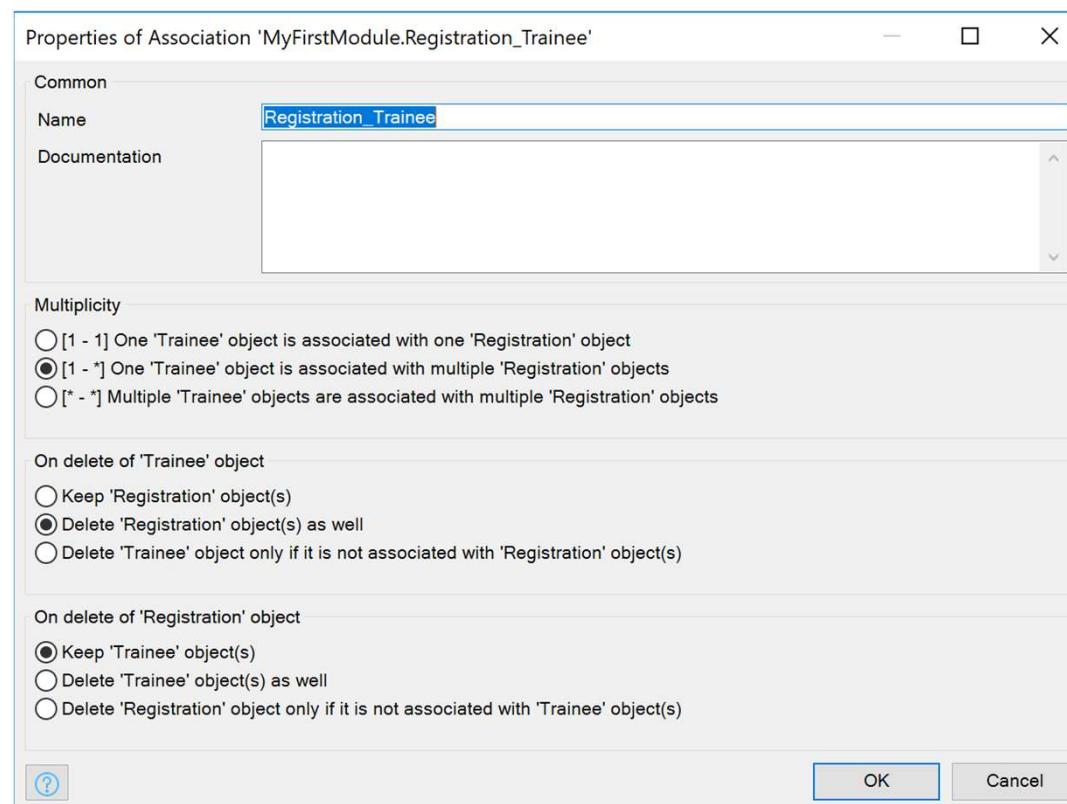




User Story 8

As an administrator, I want to be able to delete Trainees and all their Registrations, so that I can remove them from the system if they no longer wish to be a LearnNow student.

Cascading Delete





Cascade delete

Step 1: Add delete button

(Trainee, from database)
Sort order: (default)
Search on: (none)

{Name}
{Address}
{EmailAddress}

Details Delete (Empty caption)

Step 2: Add delete behavior



Knowledge checks

Go to kahoot.it

Where do you configure validation rules?

- A. In the association properties
- B. In the validation overview of the module
- C. In the entity properties
- D. At project level

What do validation rules apply to?

- A. Attributes and associations
- B. Associations
- C. Attributes
- D. Entities

What would be a best practice when deleting a Location? On delete of ‘Location’ object:

- A. Keep ‘TrainingEvent’ objects
- B. Delete ‘TrainingEvent’ objects
- C. Delete ‘Location’ objects only if it is not associated with ‘TrainingEvent’ objects

When deleting a Trainee, you want that all the Registrations of this Trainee are deleted as well. How is that delete behavior called?

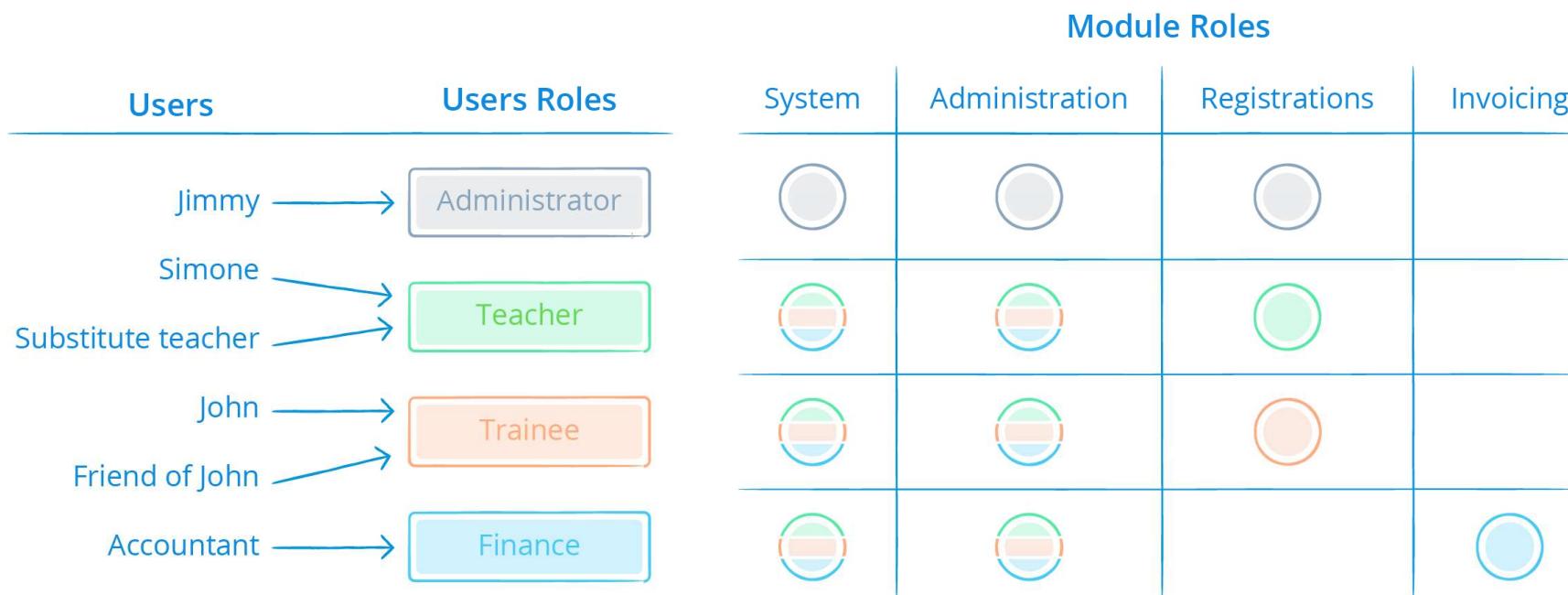
- A. Automatic delete
- B. Prevention of delete
- C. Cascading delete
- D. Delete associated objects

Make it secure

Securing your App

- Why is it important?
- What needs to be secured?
 - Project security
 - Module security
- Security levels
 - Off
 - Prototype/Demo
 - Production

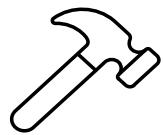
User and Module Roles





User Story 9

As an Administrator, I want the app to be
secure,
so I comply with the rules of data protection.



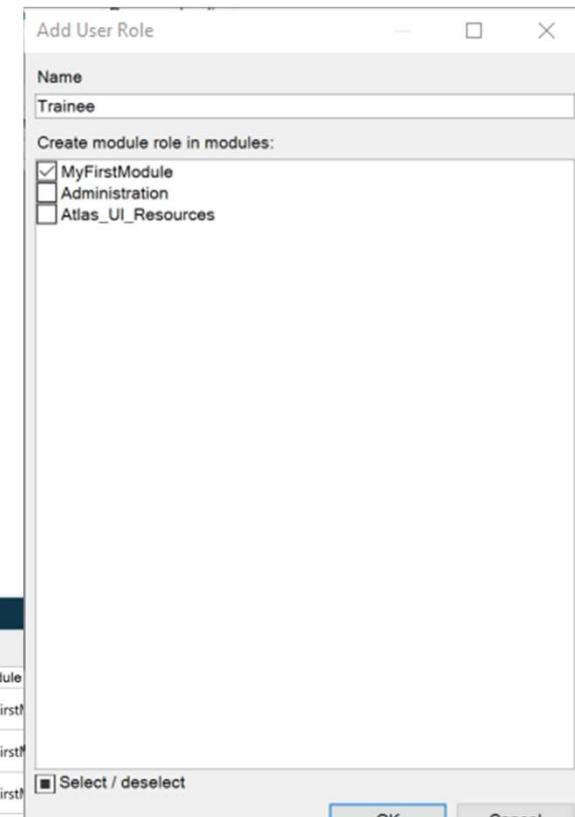
Create Module Roles

Name	Module roles
Administrator	Administration.Administrator, System.Administrator, MyFirstModule.Administrator
Teacher	Administration.User, System.User, MyFirstModule.Teacher
Trainee	Administration.User, System.User, MyFirstModule.Trainee



Create User Roles

- 1) Project Security: Prototype/Demo
- 2) 'User' user role → 'Teacher'
- 3) Create a user role 'Trainee'
- 4) Check errors



Errors

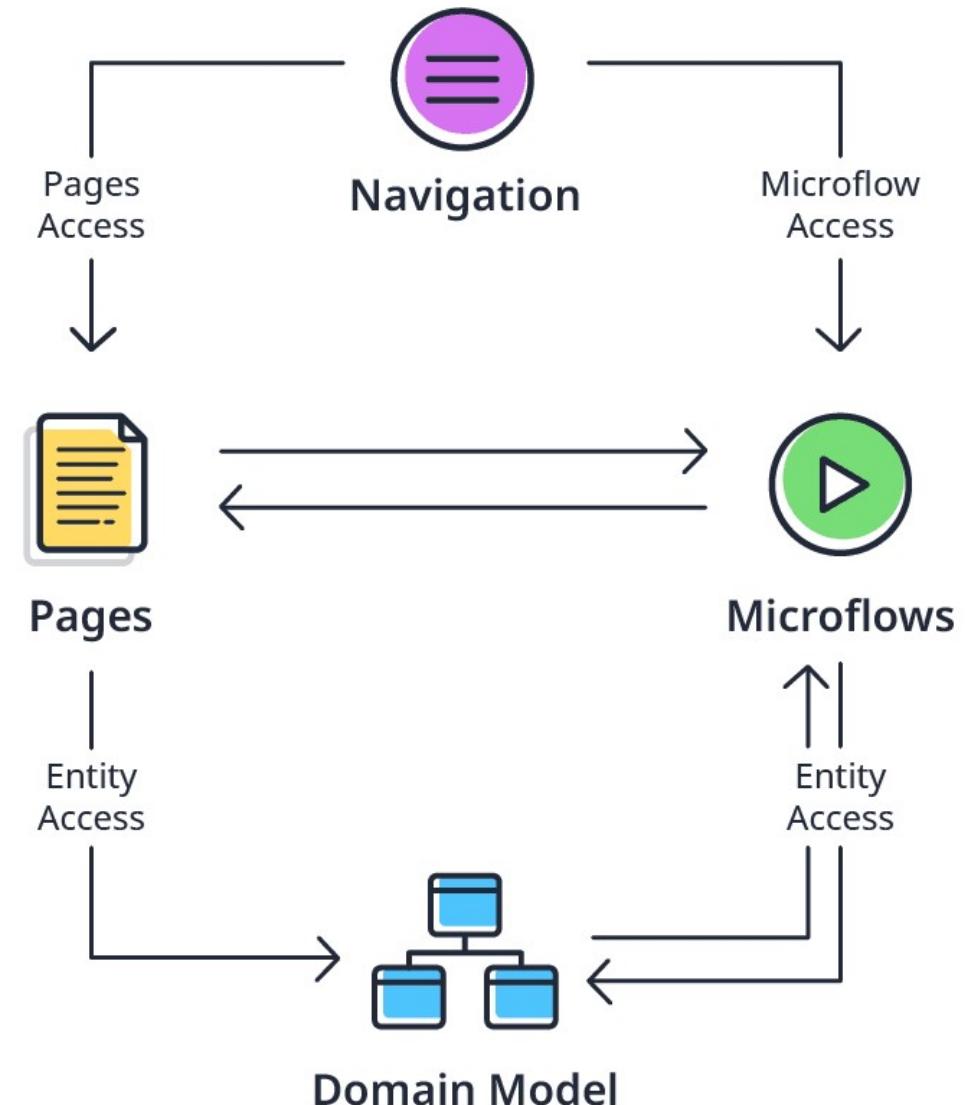
18 Errors | 0 Deprecations | 9 Warnings | Check now | Limit to current tab

Message	Element	Document	Module
3 At least one allowed role must be selected if the page is used from navigation or a button.	-	Page 'Trainee_NewEdit'	MyFirstModule
4 At least one allowed role must be selected if the microflow is used from navigation, a page or a published service.	-	Microflow 'ACT_TrainingEvent_Sched...	MyFirstModule
5 At least one allowed role must be selected if the page is used from navigation or a button.	-	Page 'Teacher_NewEdit'	MyFirstModule
6 At least one allowed role must be selected if the microflow is used from navigation, a page or a published service.	-	Microflow 'ACT_Course_Schedu...	MyFirstModule
7 At least one allowed role must be selected if the page is used from navigation or a button.	-	Page 'TrainingEvent_NewEdit'	MyFirstModule
8 At least one allowed role must be selected if the page is used from navigation or a button.	-	Page 'Registration_NewEdit'	MyFirstModule

Stories Changes (2) Errors (18) Console Find Results 1 Debugger

Access Rules

- Page access
- Microflow access
- Entity access





Set up Page and Microflow Access

- Only the Administrator should be able to create, delete, and edit training events.
- The Teacher and the Trainee shouldn't have access to these functionalities.

Page	Administrator	Teacher	Trainee
Course <ul style="list-style-type: none">• NewEdit• Overview	Y Y	N Y	N N
Home	Y	Y	N
Location <ul style="list-style-type: none">• NewEdit• Overview	Y Y	N Y	N N
Registration <ul style="list-style-type: none">• NewEdit	Y	N	N
Teacher <ul style="list-style-type: none">• NewEdit• Overview	Y Y	N Y	N N
Trainee <ul style="list-style-type: none">• NewEdit• Overview	Y Y	N Y	N N
TrainingEvent <ul style="list-style-type: none">• NewEdit• Overview• Registrations	Y Y Y	N Y Y	N Y N



Set up Role-based Homepage

Responsive Hybrid phone app online

General

Application title Mendix

Home pages

Default home page MyFirstModule.Home

Role-based home pages (none)

Menu

New item New subitem Edit Delete Go to target Expand all Collapse all Role-based view

Caption	Action	User Roles
Home	Open page 'MyFirstModule.Home'	Teacher
Courses	Open page 'MyFirstModule.Course_Overview'	
Locations	Open page 'MyFirstModule.Location_Overview'	
Teachers	Open page 'MyFirstModule.Teacher_Overview'	
Trainees	Open page 'MyFirstModule.Trainee_Overview'	
Training events	Open page 'MyFirstModule.TrainingEvent_...	

Set up Entity Access



Module Security Type 'Security'

Module roles Page access Nanoflow access Microflow access Entity access

Note: Changes you make here modify the domain model.

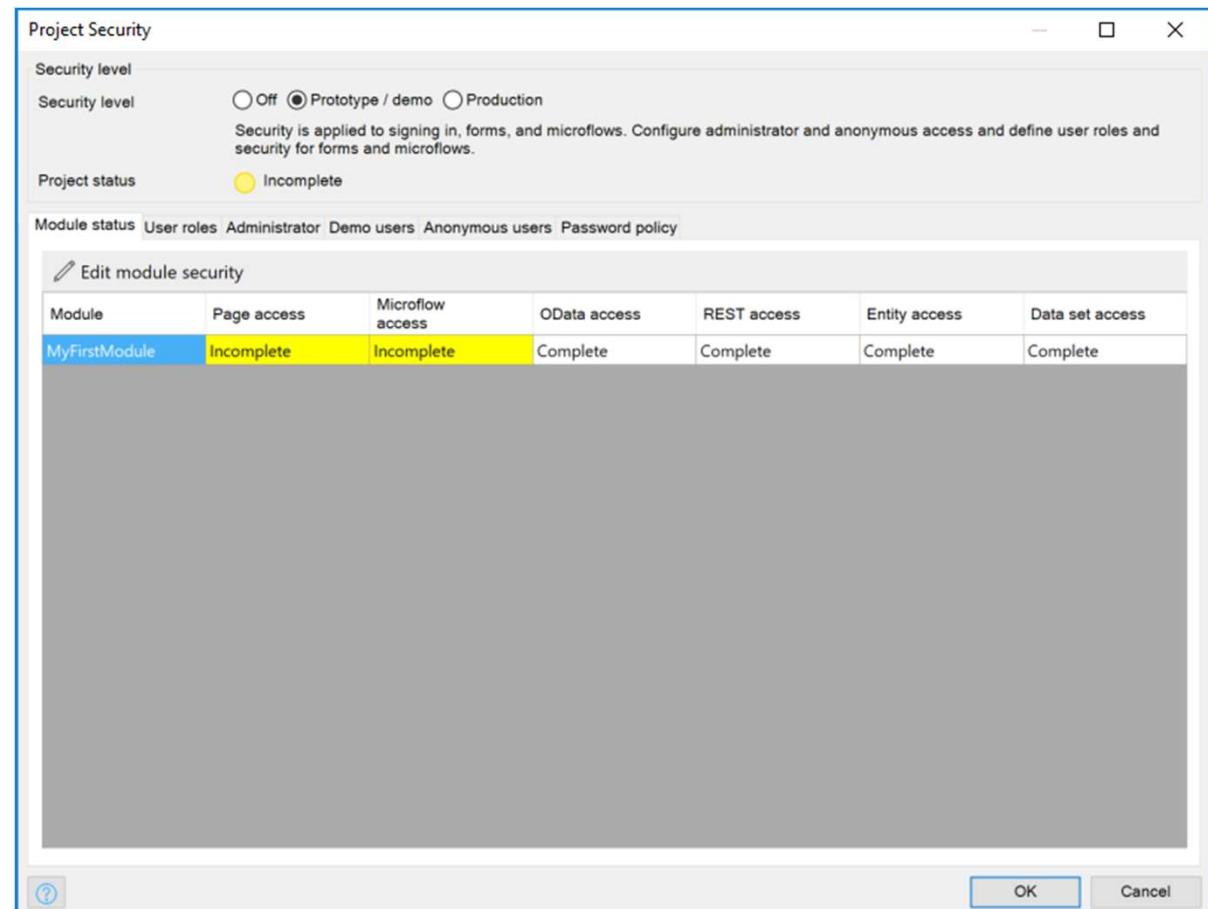
New Edit Delete Duplicate

Entity	Module roles	Create	Delete	Member access	XPath constraint
Course	Administrator	Yes	Yes	Full Read, Full Write	
Course	Teacher	No	No	Full Read, No Write	
Course	Trainee	No	No	Limited Read, No Write	
Location	Teacher	No	No	Full Read, No Write	
Location	Administrator	Yes	Yes	Full Read, Full Write	
Location	Trainee	No	No	Limited Read, No Write	
Registration	Teacher	No	No	Full Read, No Write	
Registration	Administrator	Yes	Yes	Full Read, Full Write	
Teacher	Trainee	No	No	Limited Read, No Write	
Teacher	Administrator	Yes	Yes	Full Read, Full Write	
Teacher	Teacher	No	No	Full Read, No Write	
Trainee	Teacher	No	No	Full Read, No Write	
Trainee	Administrator	Yes	Yes	Full Read, Full Write	
TrainingEvent	Trainee	No	No	Limited Read, No Write	
TrainingEvent	Administrator	Yes	Yes	Full Read, Full Write	
TrainingEvent	Teacher	No	No	Full Read, No Write	

OK Cancel

Project Security User Settings

- The Administrator Tab
- The Demo Users Tab
- The Anonymous Users Tab
- The Password Policy Tab



Knowledge checks

Go to kahoot.it

Which security level must be active to deploy an application to a test environment of a licensed node in the Mendix cloud?

- A. Production security
- B. None
- C. Project security
- D. Prototype/demo security

What effect does security have on the navigation of the application?

- A. Page and Microflow access changes the visibility of menu items.
- B. Switching security to production mode makes all menu items exclusively available to the Administrator.
- C. It has no effect.
- D. Entity access changes the visibility of menu items.

Why can you define security settings on both project and module level?

- A. It is a W3C standard to separate project and module security.
- B. This allows for a better overview.
- C. It makes it easy to reuse modules.
- D. It makes the application more secure.

A user role is required to have at least one module role in every module.

- A. True
- B. False

Make it Mobile

Mobile Apps

Do you need a mobile specific solution?

Mobile specific features:

- Navigation profile
- Mobile specific layouts
- (Native) Mobile widgets



User Story 10

As a teacher, I want to have a mobile specific homepage, so that I can easily view the training events and registrations while I move from one location to the next.

Knowledge checks

Go to kahoot.it

Go make it!

Exam



Certifications

The Mendix Developer Certification Program will help to boost your career by validating your knowledge, skill level, and contributions to the Mendix community. A certification obtained at the Rapid Developer, Advanced Developer, and Expert Developer levels contributes to your ranking and visibility, and it will be directly visible to the Mendix community.



Rapid Developer

This certification shows you understand the fundamentals of the Mendix Platform and how, when, and where to use them.

[View Details](#)

Advanced Developer

This certification exam is a practical assignment that will test your Mendix Platform skills and knowledge.

[View Details](#)

Expert Developer

Certified Expert Developers have proven capabilities in taking the lead when delivering Mendix applications to their customers.

[View Details](#)

<https://academyportalcloud.mendixcloud.com/index.html>

Want to keep learning?



The image shows the Mendix Learning Paths landing page. It features a green background with a white circular icon on the left representing interconnected nodes or paths. The title "Learning Paths" is centered above a subtitle: "When you want to pioneer a way forward, it's good to start with a path. These Learning Paths guide you through modules that build your skills." Below the subtitle is a green button with the text "Find Your Learning Path".

Your Role	Your Level	Tags
Architect	Developer	Basics Administration Collaboration Commits
Operations	Product Owner	Rapid Data Desktop Modeler Domain Model
Scrum Master	UX Designer	Advanced Errors Integration Logging
		Microflows Pages SAP
		Security Translation User Experience
		Web Modeler

Ready for the next level?



Advanced Developer Classroom

Advanced 2 Days

Take your skills to the next level and build apps using all the components of the Mendix Platform.

[View Classroom](#)

Questions?