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Beginner Tutorial

This tutorial will introduce CommCare HQ and various functionality in the application designer. We are going to create an application that will be used for maternal health counselling. It will contain the following forms

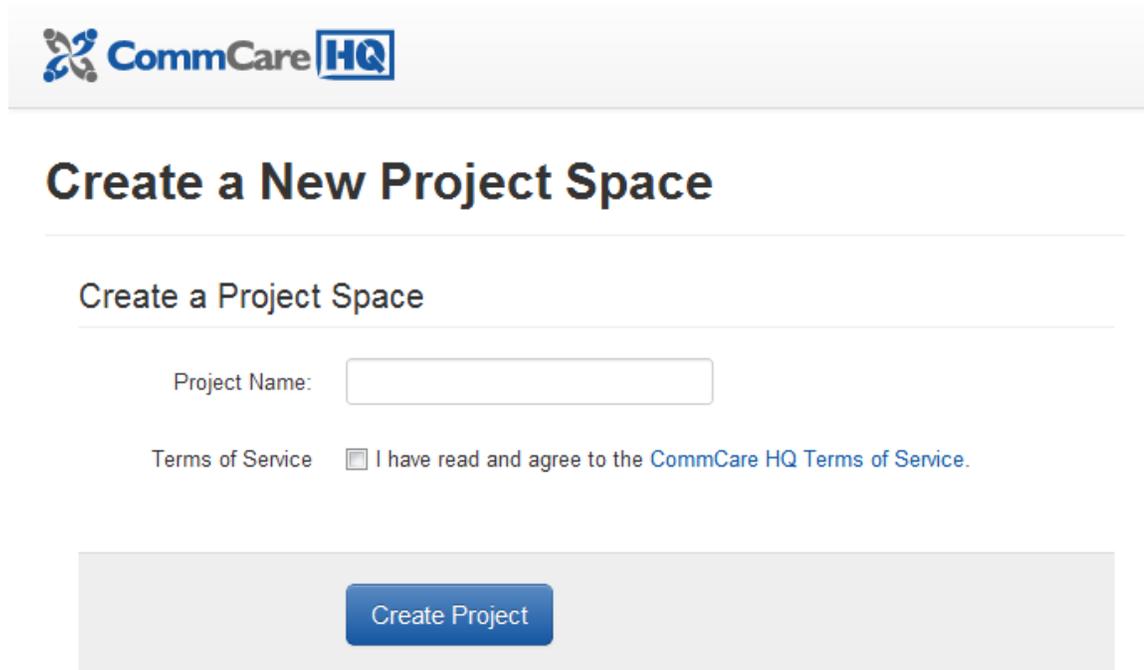
1. Registration: Used to register pregnant women with the application
2. Follow Up: Used for counselling during the pregnancy.
3. Delivery: Used to register a birth has occurred and the outcome of the birth.

First we need to setup our CommCareHQ project space.

[Set Up Your Project Space >>](#)

1. Set Up Your Project Space

If you haven't already signed up for CommCareHQ, navigate to www.commcarehq.org and register. After registration, you'll be prompted to create a Project Space. A Project Space represents the data, reports and applications for a given project. Select a project name and continue.

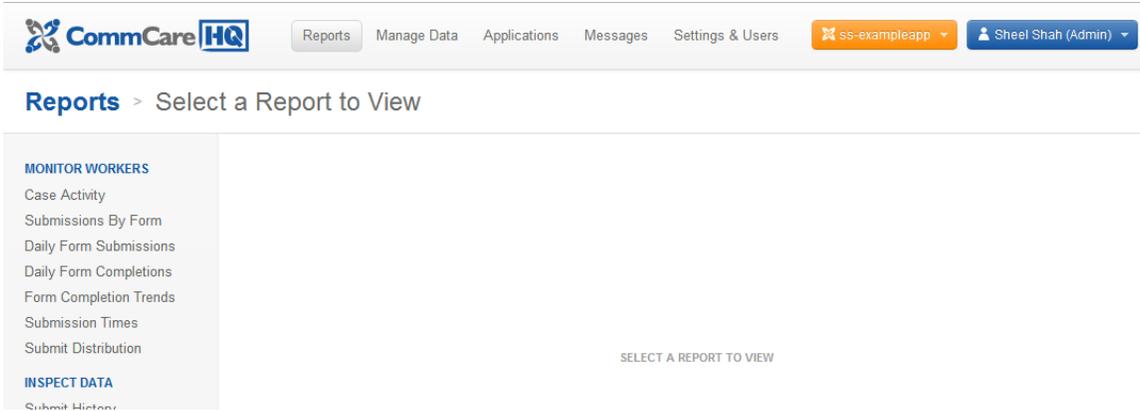


The screenshot shows the CommCare HQ logo at the top left. Below it is the heading "Create a New Project Space". Underneath, there is a sub-heading "Create a Project Space". A form field for "Project Name:" is present, followed by a checkbox labeled "Terms of Service" with the text "I have read and agree to the [CommCare HQ Terms of Service](#)". At the bottom of the form is a blue button labeled "Create Project".

Once your project space has been created (you will receive an email confirmation), you'll be navigated to the Report page. Here is a quick description of each of the sections in your domain.

1. **Reports:** This will display the available reports for your project. There are reports to monitor the activity of each worker, view the submitted data and view errors on your devices. In addition, the data entered by workers can be exported to Excel.
2. **Manage Data:** This will allow you to modify the submitted data for your project. At the moment, this will allow you to reassign cases from one user to another.
3. **Applications:** This will allow you to view and edit the applications for your domain.
4. **Messages:** This will allow you send SMS messages to one or more users in your project.
5. **Settings and Users:** This will allow you modify project level settings for your application, create new web

workers (access project using CommCareHQ) and create new mobile workers (access project applications).

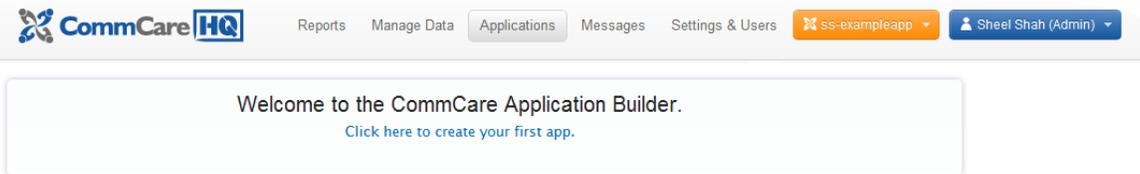


Now we can create an application in the project space.

[Create the Application >>](#)

2. Create the Application

To get started creating our application, click on the Applications section. You'll be presented with a prompt to create your first application.



Click on the link to create a new application. This will present you with the design page for the application. The left pane displays the modules and forms in your application. The right pane displays the settings for the selected item in the left pane.

Untitled Application version 1 Change Apps Switch to: Read Only

Language: en (default) Structure and Configuration Release Manager

Untitled Application

Application Settings

Name: Untitled Application Saved

CommCare Version: CommCare 1.3.0

Admin Password: Reset

Custom User Registration: Don't Use

Text Input: Default (Roman)

Success Message [?]

Supported Languages

The application settings page will allow you name the application, manage application languages and multimedia and change phone settings. For now, name the application and click the Save button. The name of your application will not appear anywhere on the mobile - it's simply for you to keep track of your application.

Click on the "Untitled module" on the left. A module is a container for cases and forms that work over those cases. We will go into case management details later in this tutorial. For now, name the module "Pregnancy" and click the Save button. This module name will be displayed on the phone to group forms.

Test Application version 4 Change Apps Switch to: Read Only

Language: en (default) Structure and Configuration Release Manager

Test Application Delete this module

Module Settings

Module Name: Pregnancy Saved

Image (optional): jr://file/commcare_media/image/image.png

Audio (optional): jr://file/commcare_media/audio/audio.mp3
 → To hear audio, you must be in CommCare Sense mode or Numeric Selection mode

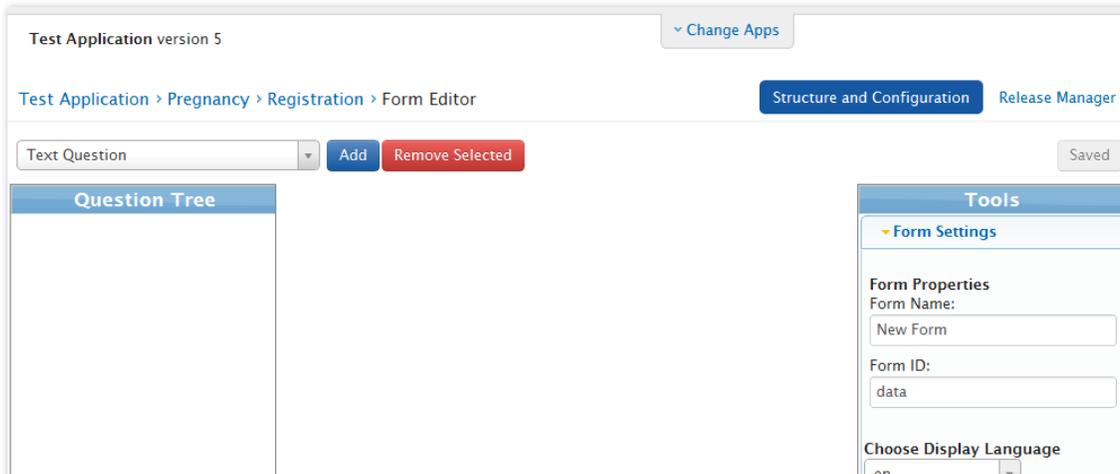
Case Type [?]

Menu: Put forms in a separate menu

Case List [?]: Don't Show Label:

Label for Cases:

Click on the "Untitled form". Name this form "Registration" and save. Below the Form Settings section, there are a set of buttons to create and upload an XForm. The XForm contains the questions for the form. Click on Create which will take you to our form designer.



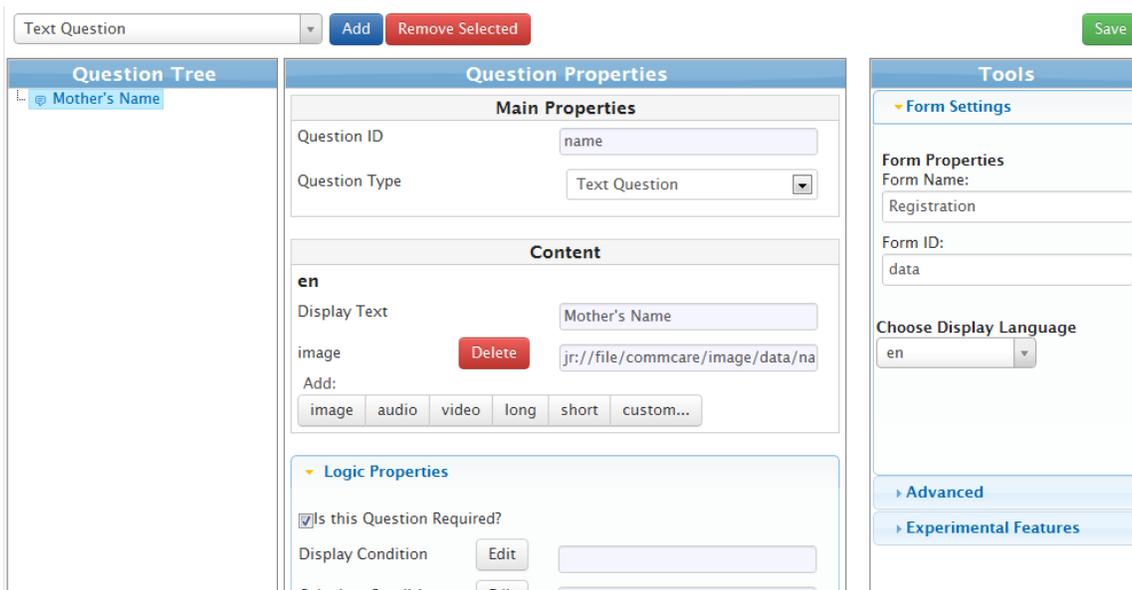
The upper left dropdown will let you add questions of different types to your form. The question tree represents the set of questions in your form. The middle pane will contain properties for the selected question.

For the registration form, we'd like to add the following questions:

1. Name of the Mother (Text Question)
2. Age (Integer Question)
3. Is Pregnant (Selection question with a Yes and No options)
4. Estimated Date of Delivery (Date question)

Add a text question to the form. The middle pane should populate with information about the question. The Question ID is a unique keyword for the question on the form. It will be used to refer to the question when writing logic or calculations and when values are displayed in reports. The Display Text is the actual text displayed on the phone for your question. If your application contains multiple languages, each language will have its own Display Text.

For this question, set the Question ID to "name" and the Display Text to "Name of the mother". We will also want to check "Is the question required?". This will force the user to enter a value before moving on to the next question.



Now lets add the age question. In the top left corner of the form designer, change the drop down to Integer Number and click the "Add" button. An Integer Number question will only allow numbers to be entered. Set the Question ID to "age" and the Display Text to "Age".

The screenshot shows the form designer interface with the following components:

- Top Navigation:** "Test Application > Pregnancy > Registration > Form Editor", "Structure and Configuration", and "Release Manager".
- Question Type Selection:** A dropdown menu set to "Integer Number" with "Add" and "Remove Selected" buttons.
- Question Tree:** A tree view showing "Name of mother" and "Age".
- Question Properties:**
 - Main Properties:** Question ID: "age", Question Type: "Integer Number".
 - Content:** Display Text: "Age", Add: "image", "audio", "video", "long", "short", "custom...".
 - Logic Properties:** "Is this Question Required?" checkbox, Display Condition: "Edit".
- Tools:** "Form Settings" section with "Form Name" (New Form), "Form ID" (data), and "Choose Display Language" (en).
- Buttons:** "Save" button.

To add the "Is Pregnant" question, we need to add a Single Select question. This question type will present a set of choices to the user and allow to select one of them. Add a Single Selection question to the form. Set the Question ID to "is_pregnant" and the Display Text to "Is Pregnant".

To add choices for a select question, click the "Add Select Item" button. This button will only appear if a select question is selected. Add two choices with item values of "yes" and "no" and Display Text of "1. Yes" and "2. No" respectively.

The screenshot shows the form designer interface with the following components:

- Top Navigation:** "Test Application > Pregnancy > Registration > Form Editor", "Structure and Configuration", and "Release Manager".
- Question Type Selection:** A dropdown menu set to "Single Select" with "Add", "Remove Selected", and "Add Select Item" buttons.
- Question Tree:** A tree view showing "Name of mother", "Age", and "Is Pregnant" with sub-items "1. Yes" and "2. No".
- Question Properties:**
 - Main Properties:** Item Value: "no".
 - Content:** Display Text: "2. No", Add: "image", "audio", "video", "long", "short", "custom...".
 - Advanced Properties:** (partially visible).
- Tools:** "Form Settings" section with "Form Name" (New Form), "Form ID" (data), and "Choose Display Language" (en).
- Buttons:** "Save" button.

To add the date of delivery question, we first need to select the Is Pregnant Question. The selected item in the left pane determines where in the question tree newly added questions are placed. If one of the options (for ex. No) is selected, the form designer will try add the new question as a child of the Is Pregnant question (which is invalid).

Add a Date question to the form. Change the Question ID to "edd" and the Display Text to "Estimated Date of

Delivery".

The screenshot shows the 'Form Editor' interface for a 'Pregnancy Registration' form. The 'Question Tree' on the left lists 'Name of mother', 'Age', 'Is Pregnant', and 'Estimated Date of Delivery'. The 'Question Properties' panel for 'Estimated Date of Delivery' shows: Question ID: edd, Question Type: Date, Display Text: Estimated Date of Delivery, and Add options: image, audio, video, long, short, custom... The 'Tools' panel on the right shows 'Form Settings' with Form Name: New Form, Form ID: data, and Choose Display Language: en. A 'Save' button is visible at the top right.

Now you're done your first form! Click the Save button and we can test the form and application.

[Testing the Application >>](#)

3. Testing the Application

To test the application, we first need to build it. Click on the Release Manager tab. The Release Manager lists all the previous builds of your application. Click on the Make New Build button. A popup should appear asking you for a comment - comments are useful for tracking which changes you've made in the application since the last build. Since this is our first build, add a comment that states "added registration form" and click OK.

Once the build has completed, it will be listed on the page. To preview the application in a web browser, select the Deploy dropdown and click on Preview.

The screenshot shows the 'Release Manager' interface for 'Test Application version 6'. It includes a 'Language' dropdown set to 'en (default)', 'Structure and Configuration' and 'Release Manager' tabs, and a table of builds. A dropdown menu is open over the first build, showing options: Deploy, Preview, CommCare J2ME Files, Send to Phones by SMS, and Download to CommCare ODK. The table has columns: Version, Build Date & Time, CommCare Binary, Comment, and Released.

Version	Build Date & Time	CommCare Binary	Comment	Released
6	Jun 06, 2012 12:05 UTC	1.3.0 (7216)	added registration form	☆

The preview will display a mock version of a phone in the web browser (note this requires Java to be installed). If you need to install Java, you should restart your browser. The preview may take a few minutes to load.

If you'd like to test the application directly on a mobile phone, instructions can be found here: [Set Up Mobile Phone](#)

The first page of the application will ask you to login. Since we haven't created any mobile workers for our project, select Login as Admin. From this page, select Demo. If you're using the browser preview, you'll need to use the keyboard to control the phone (clicking on the screen won't have any effect).

Play around with the registration form. There are a couple of issues. The form will allow you to enter estimated delivery dates in the past. The delivery date question will display even if the woman is not pregnant. We'll address these issues in the next section.

[Adding Form Logic >>](#)

4. Adding Form Logic

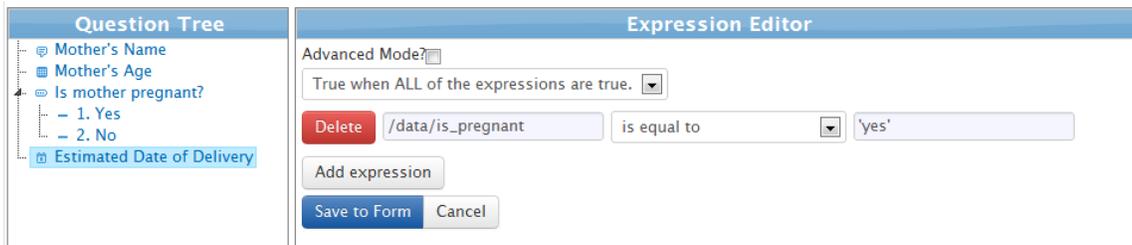
We'll need to add some logic to the Registration form to prevent users from entering dates in the past into the EDD question and to prevent the EDD question from displaying if the woman is not pregnant.

Click on the Registration form in the left pane of the form designer, then click on the Edit button in the Xforms section. Once the form has opened, click on the EDD question. The middle pane contains a Logic Properties section.

The screenshot displays the XForm Designer interface with three main panes:

- Question Tree (Left):** A hierarchical list of questions including 'Name of mother', 'Age', 'Is Pregnant' (with sub-items '1. Yes' and '2. No'), and 'Estimated Date of Delivery' (highlighted).
- Question Properties (Middle):**
 - Main Properties:** Question ID is 'edd', Question Type is 'Date'.
 - Content:** Display Text is 'Estimated Date of Delivery'. Add options include image, audio, video, long, short, and custom...
 - Logic Properties:**
 - Is this Question Required?
 - Display Condition: Edit button and text box.
 - Calculate Condition: Edit button and text box.
 - Validation Condition: Edit button and text box.
 - Constraint Itext ID: auto? checkbox and text box.
 - Constraint Message (en): text box.
 - Advanced Properties:** (partially visible at the bottom)
- Tools (Right):**
 - Form Settings:** Form Name: 'Registration', Form ID: 'data'.
 - Choose Display Language:** 'en'.
 - Advanced:** (button)
 - Experimental Features:** (button)

The Display Condition is a logic expression that controls if a particular question is displayed (when the logic is true, the question will be displayed). In our case, we want EDD to display if the is_pregnant question has a response of "yes". Click on the Edit button next to the display condition and use the expression builder to define the following statement. First click on "Add Expression", then drag and drop questions from the left tree into the available text boxes. You can also manually type values into these text boxes.



Next, we need to update the EDD question to prevent dates in the past. This is done through a Validation Condition. If a validation condition is false, the application will prevent the user from moving onto the next question. In our case, the EDD is only valid if it is greater than or equal to today's date. Use the expression builder to specify the following expression. To compare a value to today's date, use the today() function. Note that a "." specifies the value of the currently selected question.



Save the form and build another version of the application to test the logic. Additional tips on defining form logic can be found [here](#).

Now that we are done with the Registration form, we can create a Follow Up form.

[Creating the Follow Up Form >>](#)

5. Creating the Follow Up Form

To create a follow up form, click on "Structure and Configuration", then on the "+ Form" button in the left pane.

The initial follow up form for this application will be relatively simple (we'll add more complexity later). We'll be adding the following questions:

Display Text	Question ID	Question Type	Comment
Past Tetanus Vaccination?	past_tetanus	Single Select (yes/no)	This will determine whether to ask follow up questions about the first and second tetanus vaccination injections.

Had Tetanus 1?	tetanus_1	Single Select (yes/no)	This question will record whether the mother has received her first injection for the tetanus vaccination (if she hasn't already received a vaccination in the past).
Had Tetanus 2?	tetanus_2	Single Select (yes/no)	This question will record whether the mother has received her second injection for the tetanus vaccination (if she hasn't received already received the vaccination in the past).
Update EDD?	update_edd	Single Select (yes/no).	This question will determine whether to display a question to update the EDD.
New EDD	new_edd	Date	A question to enter the new EDD. This will only appear if the user answers "yes" to "Update EDD?". Will also require validation to ensure the date is in the future.

We'd also like to only have the tetanus_1 and tetanus_2 questions appear when the past_tetanus question has an answer of "no". Rather than duplicate the logic for each question, we can use a Group question type to group the two questions together. A Group question type can be used to provide a sub-title for a set of question and apply the same Display logic to all questions in the group (if a group is not shown, all the questions within the group will not be shown).

Once you've added a past_tetanus question, instead of adding a Single Select question for "Had Tetanus 1", add a Group question. Set the Question ID to "tetanus_group" and the Display Text to "Tetanus Questions". Select the group in the question tree on the left and add the tetanus_1 question. This will add this question as a child of the group. Do the same thing to add the tetanus_2 question. Its also possible to drag and drop the questions in the tree into and out of groups (or to rearrange them).

Select the tetanus_group and add the appropriate Display Logic (only display if past_tetanus is equal to "no").

Now add the "Update EDD?" and "New EDD" questions. These are not in the "Tetanus Questions" group. To add them outside the group, click on "Previous Tetanus Vaccination" then the "Add" button. You will need to drag and drop the questions to get them into the correct order.

Add the appropriate logic to the new_edd to make sure it only appears when update_edd is set to "yes" and that only a date in the future can be entered. Once you're done, the form should look like this.

The screenshot displays three panels in the CommCare configuration tool:

- Question Tree:** A hierarchical tree structure showing questions and their options. The selected path is: Previous Tetanus Vaccination? (1. Yes, 2. No) → Tetanus Questions (1. Yes, 2. No) → Had Tetanus 1? (1. Yes, 2. No) → Had Tetanus 2? (1. Yes, 2. No) → Update EDD? (1. Yes, 2. No) → New EDD.
- Question Properties:**
 - Main Properties:** Question ID: tetanus_questions
 - Content:** en, Display Text: Tetanus Questions, Add: image, audio, video, long, short, custom...
 - Logic Properties:**
 - Is this Question Required?
 - Display Condition: Edit /data/previous_tetanus = 'yes'
 - Calculate Condition: Edit
 - Validation Condition: Edit
 - Constraint Itext ID: auto?
 - Constraint Message (en):
- Tools:**
 - Form Settings:** Form Name: Follow Up, Form ID: data
 - Choose Display Language:** en
 - Advanced
 - Experimental Features

Build and test the application. You will notice that the follow up form works but has no relation to any previously registered mothers. Ideally the user would select a mother then perform a follow up. This can be accomplished using cases.

[Setting Up Cases >>](#)

6. Setting Up Cases

Cases are used to track a certain object (ex. a pregnant mother, a project site, etc.) through a particular process. Cases can be opened, updated and closed. For example, with a pregnant mother, you first need to register her (open the case), perform follow up visits (update the case) and eventually register a birth has occurred (closing the case).

Each form in a CommCare application can perform one of these three actions (open, update or close) on a case. CommCare allows multiple forms to perform each of these actions. For example, you may have two different forms that close the case (depending on if the mother delivered or passed away) or multiple different types of follow-up forms that update the case. In some applications a form may perform none of the actions and simply be used for logging some information.

Modules are a container for cases - each form in a module operates over the same type. For example, in an application you may have one module for tracking pregnant mothers and another for tracking delivered children. On the phone, modules visually group the forms.

For our application, we need to open a case from the registration form. We will need to provide a "type" for the case. The case type must be one word (no spaces) and best describe the type of case. Select the Pregnancy module and set the case type to "mother" (since we are tracking pregnant mothers).

Pregnancy Tracking
[Delete this module](#)

Pregnancy

Registration

Follow Up

Form

+ Module

Pregnancy

Module Settings

Module Name Saved

Image (optional)

Audio (optional)
→ To hear audio, you must be in CommCare Sense mode or Numeric Selection mode

Case Type

Menu

Case List Label:

Label for Cases

Label for Referrals

Now we need to configure our registration form to open cases. Select the registration form and scroll down to Case Configuration. Check "Opens a case". Each case must have a name - we'll name the mother's case according to her name. We can also choose to only open a case if the form was completed a certain way. In our application, we only open cases if the woman was pregnant (the answer to "Is the mother pregnant?" was "Yes").

Case Configuration

The app builder for 2.0 apps currently doesn't support referrals

Requires Saving...

Opens a case

if the answer to is

Name according to question

(Optional) Set External ID according to

Updates the case

We may also want to track other information about the mother with the case. This information may be used in other forms that work with the same case. In our application, we want to track the Estimated Date of Delivery as this will be displayed and used in the follow up form. Check "Updates a case" and select the "Estimated Date of Delivery" as the question. The case property (a name for that piece of information) will be defaulted to the Question ID (edd). This name is not shown anywhere on the phone's screen, so you can name it whatever best describes that information to you. It must not contain any spaces.

Case Configuration

The app builder for 2.0 apps currently doesn't support referrals

Requires

Opens a case

if the answer to is

Name according to question

(Optional) Set External ID according to

Updates the case

Question	Case Property
<input type="text" value="Estimated Date of Delivery"/>	<input type="text" value="edd"/>
<input type="text"/>	<input type="text"/>

We now need to configure our Follow Up form to allow the user to select a mother prior to opening the form. Select the follow up form and scroll down to the Case Management section. Select the "Requires" dropdown and choose "a case". We also want the Follow Up form to update the case if the user changes the EDD. Check "Updates the case" and choose the "New EDD" question. We will need to manually change the case property to "edd" to update the existing "edd" case property.

Case Configuration

The app builder for 2.0 apps currently doesn't support referrals

Requires

Updates the case

Question	Case Property
<input type="text" value="New EDD"/>	<input type="text" value="edd"/>
<input type="text"/>	<input type="text"/>

Loads data from the case

Closes the case

Saving...

The final update we need to make to the application is to configure the case display screens. These are used when displaying either a list of cases (the short version) or when displaying details for a particular case (the long version). To set these up, select the module and scroll down to the "Case Details" section. To add a case property to the short or long select it in the list. For now, we will add "name" and "edd". We'll uncheck short from the "edd" so it won't be displayed in the case list.

Case Details

Short	Long	Property	Label	Format	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	name	Name	Plain	<input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	edd	Edd	Plain	<input type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Plain	<input type="checkbox"/>
		date-opened	Date Opened	Plain	
		edd	Edd	Plain	
		external-id	External Id	Plain	
		name	Name	Plain	
		status	Status	Plain	

Create a new build of the application and play around with it either on an emulator or a phone. There are a few improvements we can make. The form will ask about a second tetanus vaccination injection even if the answer to the first vaccination injection was no. It would also be nice to display the previously entered EDD when asking whether to update it. To do this, we need to load data from the case into our follow-up form.

[Loading Case Data >>](#)

8. Loading Case Data

The follow up form is designed to be opened multiple times prior to a delivery. It doesn't make sense to ask all questions each time this form is opened. For example, during the first follow up visit, if a mother answers that she has already had a tetanus vaccination, those set of questions should not be asked again. To accomplish this, we need to load information from the case into this follow up form so that it can be used in business logic.

We will update the form to do the following:

1. Save the past_tetanus, tetanus_1 and tetanus_2 information as part of the case.
2. Load the previous answer for past_tetanus and use it to control whether to ask the question again
3. Load the previous answers for tetanus_1 and tetanus_2 and use to them to determine which questions to ask.
4. Load the EDD and display it when asking whether to update the EDD.

We need to change the form to include data nodes to store the existing case properties. A data node will not get displayed on the phone and simply serve to store some data that is used by the form. A data node can be loaded from a case property when the form is initially opened, or calculated based on the value of some other questions in the form.

Note: It is also possible to load a case property into non-data question but you will need to also setup the case update to write any changes to the value back to the case.

Open the form and edit it, adding data nodes to represent prev_edd, prev_past_tetanus, prev_tetanus_1 and prev_tetanus_2. It's a good idea to label these data nodes consistently (i.e. prev_<case_property_name>). Once done your question tree should appear as follows.

The screenshot displays three panels in a web-based form configuration tool:

- Question Tree:** A hierarchical tree view on the left. The selected node is `prev_tetanus_2`, which is a child of `Update EDD?`. Other nodes include `Previous Tetanus Vaccination?`, `Tetanus Questions`, `Had Tetanus 1?`, `Had Tetanus 2?`, `Update EDD?`, `New EDD`, `prev_edd`, `prev_past_tetanus`, `prev_tetanus_1`, and `prev_tetanus_2`.
- Question Properties:** A central panel for configuring the selected question. It includes:
 - Main Properties:** Question ID: `prev_tetanus_2`
 - Logic Properties:**
 - Is this Question Required?
 - Display Condition: [Edit] [Text Input]
 - Calculate Condition: [Edit] [Text Input]
 - Validation Condition: [Edit] [Text Input]
 - Constraint Itext ID: `auto?` [Text Input]
 - Constraint Message (en): [Text Input]
 - Advanced Properties:** A collapsed section at the bottom.
- Tools:** A right-hand panel with:
 - Form Settings:** Form Name: `Follow Up`; Form ID: `data`
 - Choose Display Language:** `en` (selected)
 - Advanced:** A collapsed section.
 - Experimental Features:** A collapsed section.

Save the form and return to the main screen for the form. We'll need to save the values of `past_tetanus`, `tetanus_1` and `tetanus_2` so that they can be used when the follow up form is opened in the future. Modify the "Updates the case" section to include them.

The screenshot shows the configuration for the "Updates the case" section:

- Requires:** `a case` (selected in dropdown)
- Updates the case:** (checked)
- Table:**

Question	Case Property
New EDD	edd
Past Tetanus Vaccination?	past_tetanus
Had Tetanus 1?	tetanus_1
Had Tetanus 2?	tetanus_2
[Empty]	[Empty]
- Additional Options:**
 - Loads data from the case
 - Closes the case
- Save:** A green button in the top right corner.

We need to update the form to load the values from the case into our data nodes. Check "Loads data from the case" and select each of our data nodes. The case property to load is defaulted to the ID of the question. As our case properties are named differently, we'll need to manually specify them as shown.

Loads data from the case

Question	Case Property
/data/prev_edd (Hidden)	edd
/data/prev_past_tetanus (Hidden)	past_tetanus
/data/prev_tetanus_1 (Hidden)	tetanus_1
/data/prev_tetanus_2 (Hidden)	tetanus_2

Closes the case

Now that we've loaded data into the form, we can update the logic in the form to rely on these previous values.

Update EDD

We'd like to display the previous value of the EDD when displaying the "Update EDD?" question. For example, instead of just asking "Update EDD?", we want to display "Current EDD is 01/06/2013. Change the EDD?". To do this, we need to include the value of the prev_edd data node in the display text for the "Update EDD?" question. To display the value of another question in the text of another, we use an `<output ref="question path" />` tag. The question path is typically `/data/<question_id>`. Change the Display text of the question to the "EDD is `<output ref="/data/prev_edd" />`. Change the EDD?"

The screenshot shows the form editor interface with three main panels:

- Question Tree:** A hierarchical list of questions. The question "EDD is `<output ref="/data/prev_edd" />`" is selected and highlighted in blue.
- Question Properties:**
 - Main Properties:** Question ID is "update_edd", Question Type is "Single Select".
 - Content:** The Display Text is "EDD is `<output ref="/data/prev_edd" />`". The Add button is set to "custom...".
 - Logic Properties:** There is a checkbox for "Is this Question Required?" and a "Display Condition" field with an "Edit" button.
- Tools:**
 - Form Settings:** Form Name is "Follow Up", Form ID is "data".
 - Choose Display Language:** The language is set to "en".
 - Advanced:** A button to expand more options.

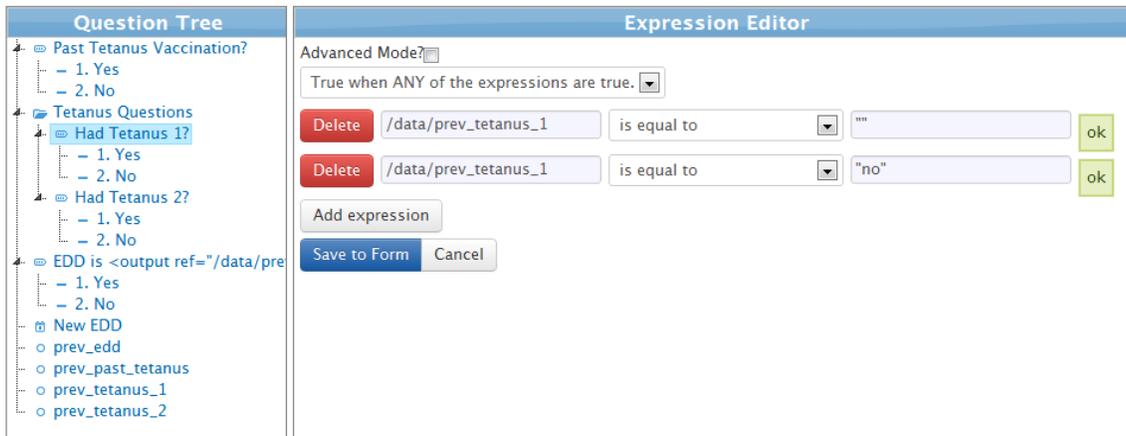
Past Tetanus Vaccination

We need to update the display logic of the "Past Tetanus Vaccination" question. This question should only be displayed during the first follow up (if the previous answer to the question is blank). Select the "Past Tetanus Vaccination" question, and click on the "Edit" button next to the display condition. To test for a blank value, you can use two quotations (indicating empty). Add the appropriate display logic to the question.

We also need to update the logic for the tetanus group to depend either on the current or previous answer to past tetanus vaccination - the "Past Tetanus Vaccination?" question will not have a value if it is skipped due its display logic. Use the expression editor to change the display logic for the tetanus group. First change the "True when ALL of the expressions are true." to "True when ANY of the expressions are true.". Then add another expression to check if the value of "prev_past_tetanus" was "no".

Tetanus 1 Question

We want to continue to ask about the first tetanus vaccination until the mother receives it. Try figure out the display logic for this on your own. If you're stuck, correct logic is shown below.



We want to display this question if the previous answer for tetanus_1 was "no" or if there the previous answer was blank. The previous answer will be blank the first time we go through this form for a case - we want the tetanus_1 question to be displayed in this situation. The logic is shown below. Its important to note that the drop down has been changed to "True when ANY of the expressions are true."

Tetanus 2 Question

We also want to continue to ask about the second tetanus vaccination until the mother receives it. However, we only want to display this question if the mother has already received her first tetanus vaccination injection.

The logic for this is a little complex and can't be created using the expression editor. You will need to directly type the logic expression. There are two parts to this expression that must **both** be true to display the question:

1. We should only ask about tetanus_2 if the mother has already received tetanus_1
2. We only want to ask about tetanus_2 if the mother has not already received tetanus_2

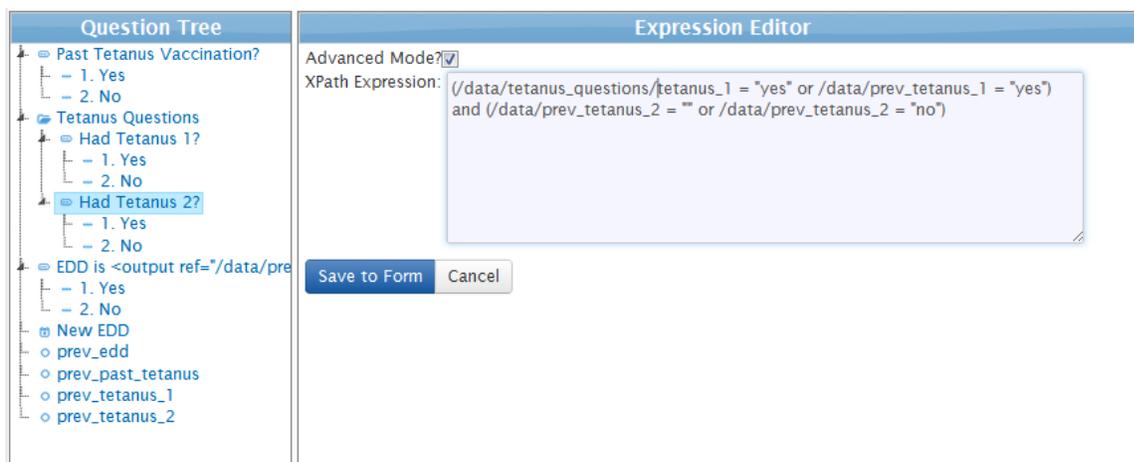
The first part of this can be represented using `"/data/tetanus_group/tetanus_1 = "yes" or /data/prev_tetanus_1 = "yes")`. We need to check both tetanus_1 and prev_tetanus_1 since the tetanus_1 question may not be answered in this particular follow up visit (but may have been answered previously). Note that we refer to tetanus_1 as `"/data/tetanus_group/tetanus_1"` since it is inside the tetanus_group group.

The second part can be represented using `"/data/prev_tetanus_2 = "" or /data/prev_tetanus_2 = "no")`. We only want to ask about tetanus_2 if the user has not previously answered the question or had previously answered that they had not yet received it.

Since we only want to display the tetanus_2 question when **both** of the above two conditions are true, we combine them using an *and* operator. The full logic expression that we need to express is the following:

```
((/data/tetanus_group/tetanus_1 = "yes" or /data/prev_tetanus_1 = "yes") and (/data/prev_tetanus_2 = "" or /data/prev_tetanus_2 = "no"))
```

To manually enter the logic expression, open the expression editor for the tetanus_2 display condition and check "Advanced mode?". This will replace the expression editor buttons with a text box. Enter the expression we defined above and click the "Save to Form" button.



Testing it Out

Create another build of the application and test it either in the phone or emulator. Try perform multiple follow up visits with the same mother and make sure that everything is working okay. The last change that we'll make to the application is to create a Delivery form. This will be used to track the birth outcome and close the mother's case.

[Closing Cases >>](#)

9. Closing Cases

The Delivery form will record the birth outcome, number of children delivered and close the mother's case. When a case is closed it will no longer appear on the phone for doing follow-up visits. We want to add Delivery form with the following questions.

Display Text	Question ID	Question Type	Comment
Did the mother deliver?	mother_deliver	Single Select (yes/no)	This question will control whether to close the case and display of the other questions in the form.
Delivery Date	delivery_date	Date	This question will need validation to ensure the delivery date is today or in the past.
Type of Delivery	delivery_type	Single Select (Caesarian/Vaginal)	
Number of Children	num_children	Integer	The number of children that were delivered. This should be defaulted to 1. This question is required and will also need to validation to ensure that only numbers 0 or greater can be entered.

Gender	gender	Single Select (male/female)	The gender of the child. This should be repeated for each child that was delivered.
Birth Weight (kg)	birth_weight	Decimal	The weight of the child. This should be repeated for each child that was delivered. Additionally, it will need validation to ensure that only positive birth weights can be recorded.

We don't want our application to display any of the delivery information questions if the mother has not delivered. We can again use a group to apply the same display logic to all the questions in the form after the mother_deliver question. Call the group "Delivery Information" (delivery_information) and add the appropriate display logic. Add the "Delivery Date" and "Type of Delivery" questions to this group.

The screenshot shows three panels in the form builder:

- Question Tree:** A tree view showing the hierarchy of questions. The "Delivery Information" group is expanded, containing "Delivery Date" and "Type of Delivery" (with sub-items "1. Caesarian" and "2. Vaginal").
- Question Properties:** The configuration for the "Delivery Information" group.
 - Main Properties:** Question ID is set to "delivery_information".
 - Content:** Display Text is "Delivery Information".
 - Logic Properties:** "Is this Question Required?" is checked. The Display Condition is set to "/data/mother_deliver = 'yes'".
- Tools:** The "Form Settings" panel, showing Form Name as "New Form" and Form ID as "data".

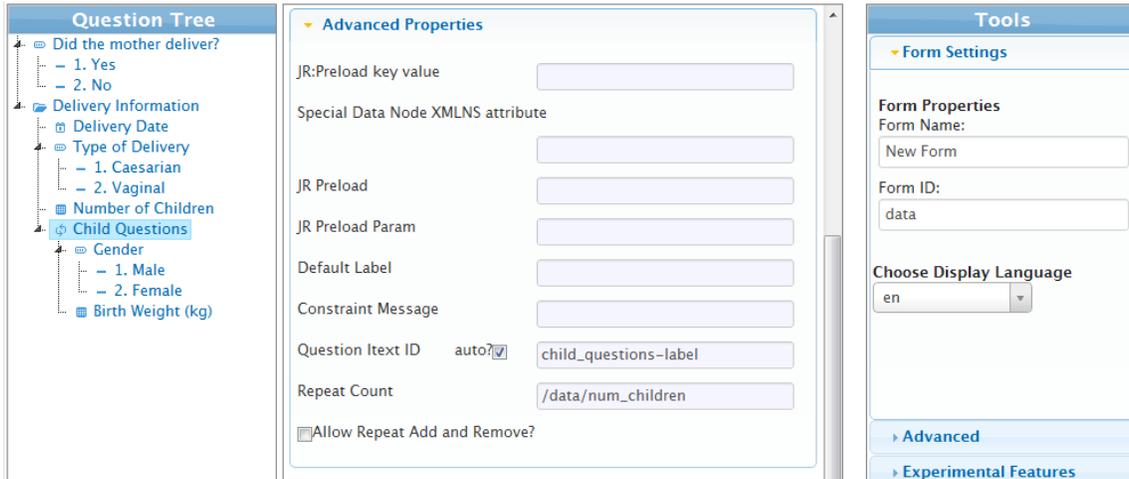
Add an integer question for "Number of Children". This question will control the number of types to repeat the gender and birth weight questions. Check "Is this Question Required?" to force the user to enter a value and add validation logic to ensure that only positive values are entered. To default the value of this question to 1, open the Advanced Properties section and change the "Default Data Value" to 1.

The screenshot shows the configuration for the "Number of Children" question:

- Question Tree:** The "Number of Children" question is now added to the form structure.
- Question Properties:**
 - Logic Properties:** "Is this Question Required?" is checked. The Validation Condition is set to ". >= 0".
 - Advanced Properties:** The Default Data Value is set to "1".
- Tools:** The "Form Settings" panel remains visible, showing the same configuration as in the previous screenshot.

To repeat a question (or set of questions), we need to use a Repeat Group. This question will either repeat the questions a set number of times (ex. number of children) or provide a prompt to allow the user to choose whether to repeat the questions again. The advanced property "Repeat Count" is used to set the repeat count. It must point to another question and that question must have a value (this is why our Number of Children question is required).

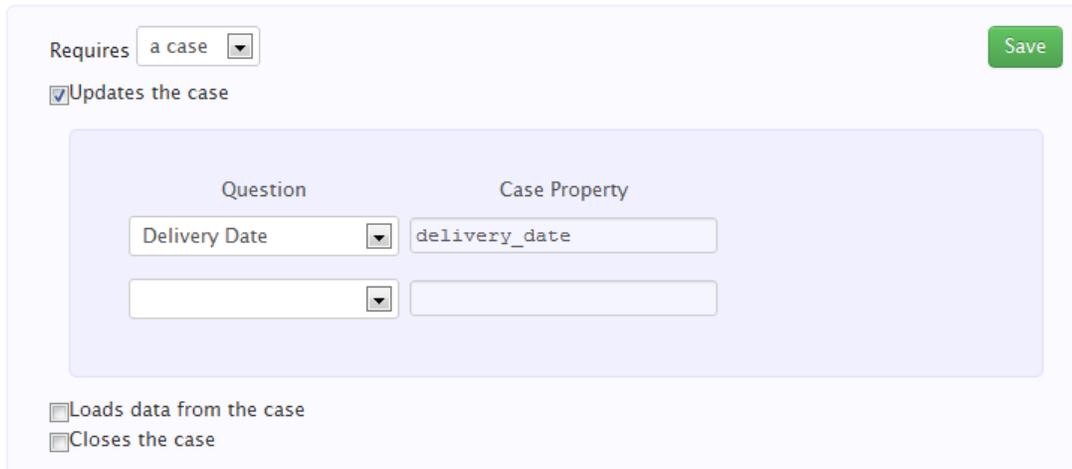
Add a Repeat question to the delivery information group. Name it Child Questions (child_questions). Set the value of "Repeat Count" property to "/data/num_children". Add the appropriate gender and birth weight questions to this Repeat group.



Save the form and return to the main form screen. We want the Delivery form to require a mother be selected, save the delivery date as part of the case and close the case if the mother has delivered. In the Case Configuration section, set "Requires" to "a case". Modify the "Updates the case" section to include the delivery date.

Case Configuration ?

The app builder for 2.0 apps currently doesn't support referrals



As with creating cases, we can also conditionally close cases. Check "Closes the case" but add logic to only close it if the mother delivered.

Case Configuration ?

The app builder for 2.0 apps currently doesn't support referrals

Requires ▼ Save

Updates the case

Question	Case Property
<input type="text" value="Delivery Date"/> ▼	<input type="text" value="delivery_date"/>
<input type="text"/> ▼	<input type="text"/>

Loads data from the case

Closes the case

if the answer to ▼ is ▼

Now we've got a functional application that can create, update and close cases! Create a new build of the application and test it out in the emulator or mobile phone.

[Next Steps >>](#)

10. Next Steps

Our application can be extended in a number of different ways. We can expand the forms, add multimedia, create referrals for a patient, or try the application out on an Android phone. We may want to start to view and manage the collected data using CommCare HQ.

1. [Managing Mobile Workers and Web Users](#)
2. [Managing Captured Data](#)
3. [Installing an Application on Android](#)
4. [Setting Up Multimedia in the Application](#)
5. [Common Logic and Calculations](#)
6. [Additional Information on Managing Cases](#)

Good luck in your application building!