

# Create an Electronic Form Solution with DB2 pureXML and Lotus Forms

## Introduction (10 seconds)

Electronic forms, or eForms, provide a means to replace costly and resource-intensive paper form processes with efficient, streamlined on-line processes. In this demonstration, we will walk you through the steps of creating an electronic form data collection solution with IBM software. Let's get started.

## Solution Overview (1 minute)

This solution uses an electronic form to capture input data as XML, and submits the data through a web service directly into the DB2 database without requiring reformatting of the form data. To build the solution, first we use the DB2 Command Editor to create a DB2 database and a table with native XML storage support. Then we use Data Studio Developer to create the web service which will connect the form and database and we deploy it to an application server, in our case WebSphere Application Server Community Edition. We then use Lotus Forms Designer to create an electronic form, including the mechanism for web service submission. With those three steps, the development of our eforms solution is completed. We run the application by using Lotus Forms Viewer to display the form, capture the data, and send it to the web service and into the database. We then show how the XML form data can be queried against in DB2 or by other applications such as Cognos BI. Let's begin building our eForms solution.

## Create Database and Table (30 seconds)

pureXML makes storing XML data easy. The steps to create a table with XML support are pretty much the same as when we create a table for any data. We create the database, connect to the database, and then create our table. To store XML natively, we specify the data column as a type of XML which allows XML document to be stored in its hierarchical structure without alteration. We will keep it simple and have just the one XML column in our table though XML and other data could be in the same table.

## Create Web Service (2 minutes)

Now we create the Web Service. When we open Data Studio Developer, we can see the database we just created in DB2. We need to establish a connection so that we can work with this database to create a web service to interact with this database. Now we create a new project: first we give the project a name then we select the connection to our target database as the basis for our web service. Then we create a simple SQL statement which inserts XML form data from a parameter into the XML column of the table we created earlier. You can INSERT XML data just as you would any other data type. We then create a new web service, and simply drag the SQL statement and drop it onto the web service to create the operation which will accept the XML form data and then insert it into the table. Now we can deploy the web service to our application server, which is WebSphere Application Server Community Edition. After the web service is deployed, we save a copy of the W.S.D.L. (or "wisdal") to the local directory.

### Create eForms (3 minutes)

Now we switch to Lotus Forms Designer to create a new form. We attach the WSDL file we created in Data Studio to the form. We then generate an XML instance from the attached WSDL message. We choose SOAP procedure for its XML support. Since our web service simply identifies that an XML document is being sent, we next define the specific elements that will make up that document. We switch to the source view to complete the XML structure of the instance, though it could also be done right in the instance view. We'll keep it simple and just include data for a name, userid, and phone number. Once our XML data instance is complete, we simply drag it onto the form template to create the labels and fields for entry of the data. This also binds the fields to the XML instance, as indicated by the yellow highlighted references next to the elements. Now we create an XForms submission process for this instance. The submission will send collected data to the web service. We switch to the source view and fill in the necessary parameters for the submission, which we get from the WSDL. After the submission process is created, we need to create an XForms Submit button that executes this submission. Point the button to the submission process we just created, using the Properties window. Now the form development is complete and we don't need the WSDL file anymore so we delete it from the form. We can preview the form in the embedded Lotus Forms Viewer and input some test data and submit the form. We switch back to DB2 and with a simple query we can see the XML form data has been inserted into the table; it can be presented in either a tree view or source view.

### Submit and Query eForms (1 minute)

Extending the concepts we showed, sophisticated, even multi-page, forms can be created with Lotus Forms Designer. We now show a form designed to collect household census information that we connected to the same web service and database. Lotus Forms can implement form-based data validation to ensure the correctness of the input data. Here you see that incorrect data is flagged by the form until the data is corrected. Lotus Forms also has the capability of adjusting the available fields based on the user input. Once all the required fields are entered, as before, we click the submit button to send the XML form data to the web service. In DB2, we can see the XML structure of this form data is bigger and more complex, but still able to be stored in the same column. After entering more sample data, we use SQL/XML to query against specified elements in the XML Census form. Here is a query which returns the selected personal information from the XML in a relational-like format, using the XMLTABLE function. Using SQL/XML or XQuery, we can query against any desired elements or attributes of the XML data stored in DB2. These queries can be run using query tools or embedded in external applications

### Reporting with Cognos (1 minute)

We can also use business intelligence application like Cognos BI to generate reports from the XML form data that is stored in DB2. The steps for generating reports from XML data are similar to generating reports from relational data. The detailed steps for report design are beyond the scope of this demo but here we show a report based on the XML Census form data we input. This report uses a query similar to what we showed earlier, summarized for the education level field of the forms.

### Summary (1 minute)

As you can see, by integrating the electronic form capabilities of Lotus Forms with the efficient XML data management of DB2 pureXML, connected by easy-to-deploy web services created in Data Studio Developer, it is quite easy to create and run an XML electronic forms application to replace costly and inefficient paper processes. This XML based eForms solution is a simple yet powerful way to automate form processing for both public and private sectors. With this solution, the complete submitted form data is immediately available to be queried, reported on, or provided for further business processing. To find out more information, or to download a free copy of DB2 Express C with pureXML, please visit the web sites shown. Thank you.