

Table of Contents

- Writing client-side plugins** 2
 - Using Javascript to integrate custom Cordova plugins for native mobile applications***
..... 2
 - Creating a contact on the phone 3
 - Send email to the selected contact 4

[Programmers Reference](#), [Client Side Plugins](#)

Writing client-side plugins

In **Aware IM** you can not only add plugins for the server (such as custom processes, channels or functions), but you can also add plugins that execute on the client within a web browser. Most of the time you would write these plugins in order to add your custom user interface functionality, or modify the default **Aware IM** user interface behaviour.

All client-side plugins must be written in Javascript and in most cases you need the knowledge of the [Kendo UI](#) Javascript library from Telerik and a popular open source Javascript library called [jQuery](#) . The description that follows assumes that the reader is familiar with Javascript, Kendo UI library and jQuery.

There are several types of the client-side plugins you can add in **Aware IM**:

1. Modify the default behaviour and presentation of forms
2. Modify the default behaviour and presentation of form sections in forms
3. Modify the default presentation of individual fields within forms
4. Modify the default presentation and behaviour of queries
5. Modify the default presentation and behaviour of content panels inside visual perspectives

We will look at each of these client-side plugins separately

Using Javascript to integrate custom Cordova plugins for native mobile applications

Cordova plugins are components that provide access to some built-in features of mobile phones, (such as camera or contacts), for which there is no Javascript access. When components are integrated into the system these features become available through some special Javascript functions that the plugin makes available to the developer. Cordova plugins can only be used in native mobile applications.

Aware IM integrates some Cordova plugins out-of-the-box and provides rule actions that activate them (for example, MOBILE PUSH or MOBILE CAMERA SNAP INTO). However, there are many plugins around and it is impossible to integrate all of them into Aware IM.

Still there is a way to do this by adding some custom Javascript to your application. The following section explains how to do it.

This is the high level overview of what needs to be done:

1. Study the documentation of the Cordova plugin to fully understand Javascript methods that it exposes
2. Write the Javascript that calls the appropriate Javascript function that the plugin provides
 1. Give this function the data obtained from Aware IM if necessary. For example, read the data from the database and provide this data to the function of the plugin. The useful Aware IM function that can be used here is `AwareApp.getObjectData()`

2. Handle the return of this function if necessary – for example write the data returned by the function to the database. Useful Aware IM functions for this are `AwareApp.createOrUpdateObject()` and `AwareApp.startProcessWithInit()`
3. Define panel operations or menu items in the mobile part of your business space version (using the Configuration Tool) that would run this Javascript. You should select an operation or menu item of the “Execute Javascript” type for this.
4. Build a native mobile application for your business space version using the “Build Native Mobile Application” command in the Configuration Tool. This will create a zip file.
5. Uzip this zip file somewhere. Find the `config.xml` file in the root of the unzipped application and open it for editing.
6. Find the section in this file that lists the plugins used by the application, for example:

```
<plugin name="cordova-plugin-camera" spec="2.0.0" />
```

Add the definition of the Cordova plugin you need to integrate – look up the documentation of the plugin for details of the plugin name and version number

1. Zip up the application again and use the PhoneGap build to create application files in the native format of the mobile phone

Let’s look at an example. We will be integrating a Cordova plugin for Contacts into the CRM mobile sample application.

The documentation of the plugin can be found here:

<https://github.com/apache/cordova-plugin-contacts>

As we can see the plugin provides the `navigator.contacts` object that can be used to create contacts, find existing contact or pick a particular one. Let’s add the following functionality to the CRM application:

1. From the form of a customer or from a customer list create a phone contact populated with the information from the customer record in the application
2. Pick a contact from the list of phone contacts and send this contact an email that includes some information stored in the application

Creating a contact on the phone

We need to use the “create” method of the `navigator.contacts` object and provide contact data available in the customer record that we are parked on. Retrieving the data can be done using the `AwareApp.getObjectData` function. It has the following signature:

```
getObjectData: function (objectName, objectId, callbackFunction)
```

`ObjectName` and `objectId` identify the record to retrieve and `callbackFunction` specifies a function that will be called when the data has been retrieved. The function will be called with the object storing the retrieved values.

How do we get object name and id? When we define an Aware IM operation of the “Execute Script” type Aware IM automatically defines the following objects that we can use in our Javascript:

1. parser
2. context

The parser object should be already familiar and the context object stores an array of objects with `objectName` and `objectId` attributes. The record we are parked on is the first and only one in this array. So to get `objectName` we use the following `context[0].objectName`; and to get object id we use `context[0].objectId`

So the Javascript we need to write to create a contact looks like this:

```
AwareApp.getObjectData (  
context[0].objectName,  
context[0].objectId,  
function (objectData)  
{  
navigator.contacts.create ({  
"displayName": objectData["FirstName"] + " " + objectData["LastName"],  
"birthday": kendo.parseDate (objectData["DateOfBirth"], "dd/MM/yyyy", "en-US")  
});  
}  
);
```

Note that here `displayName` and `birthday` are the names of the attribute of the Contact object on the phone exposed by the plugin, whereas `FirstName`, `LastName` and `DateOfBirth` are the names of the attributes of the Customer object in the CRM application. Note also that all Aware IM attribute values are strings and if the plugin requires some other type (for example, date), then the strings need to be converted to the appropriate type.

The next step is to create operations of the "Execute Script" type to the form and customer list. We can add a panel operation to the "Editing Mobile" form of the Customer object and an operation with record to the "Customer - all mobile" query. We then specify the above script as a parameter of the operation.

Send email to the selected contact

We need to use the `pickContact` method of the `navigator.contacts` object to display a list of contacts, let the user pick one and then we need to start a process in the application to send an email to the email address of the contact picked by the user.

The email address returned by the plugin needs to be saved in some temporary object and then this object can be used in the process. So we will create a temporary business object (persistence type - memory) called `ContactParam` with the single `EmailAddress` attribute. We will then create a process called `SendEmailToContact` with the `ContactParam` object as its input. The process will then use the `SEND` action to send any email to this email address (the email can use tag expressions to retrieve some information from the system - for example, from `SystemSettings` or from the logged in user).

To start a process we will use the `AwareApp.startProcessWithInit` function. It has the following signature:

```
startProcessWithInit: function (procName, renderOption, objName, initValues, context)
```

Here `procName` is the name of the process to start, `renderOption` is where to display the results of the process (we can use `null`), `objName` is the name of the parameter object, `initValues` is the object storing values of the parameter object and `context` contains additional parameter objects (null in our case)

So our Javascript can look like this:

```
navigator.contacts.pickContact (function (contact)

{

var email = contact.emals[0].value;

AwareApp.startProcessWithInit (

"SendEmailToContact",

null,

"ContactParam",

{ "EmailAddress" : email }

},

function (error { console.log (error); }

);
```

Then we just need to add a command of the "Execute Script" type to the mobile menu of the application.

- [Architecture of the client-side code](#)
- [Modifying default behavior and presentation of queries](#)
- [Modifying default behavior and presentation of forms](#)
- [Modifying default behavior and presentation of form sections](#)
- [Modifying default presentation of individual fields on forms](#)
- [Modifying default behavior of menu in visual perspectives](#)
- [Modifying default behavior and presentation of content panels in visual perspectives](#)
- [AwareApp object](#)
- [Using Javascript to integrate custom Cordova plugins for native mobile applications](#)

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