Introduction to Low Code Mobile Apps Development

22 - 23 Sept 2022

outsystems

REPUBLIC POLYTECHNIC

Recap – Day 1 was about…..

- Creating Screens, placement of UI components
- Event handling (buttons – on click)
- Creating a database entity

- Data is important
- Outsystems Service Studio will attempt to infer the structure of data encountered
- Outcome -> Presentation of data becomes easy

Programme Day Two

Morning	Afternoon

○ Web Service
   ■ Explore JSON data structure
   ■ Set up and consume Web Service
   ■ Display JSON data
 	
○ Debugging
   ■ Setting Breakpoints
	○ OutSystems Plugins
	   ■ Camera Plugin
	   ■ Barcode Plugin
	
	○ Use-cases
	   ■ Sharing of personal use case
	   ■ GRIT App
	   ■ Fault Reporting App
	
	○ OutSystems Development Environment in RP
	○ Additional Learning Resources

Web Services

Web Services

Set of functionalities offered by a software system over the World Wide Web

- Provided as language-agnostic remote procedures
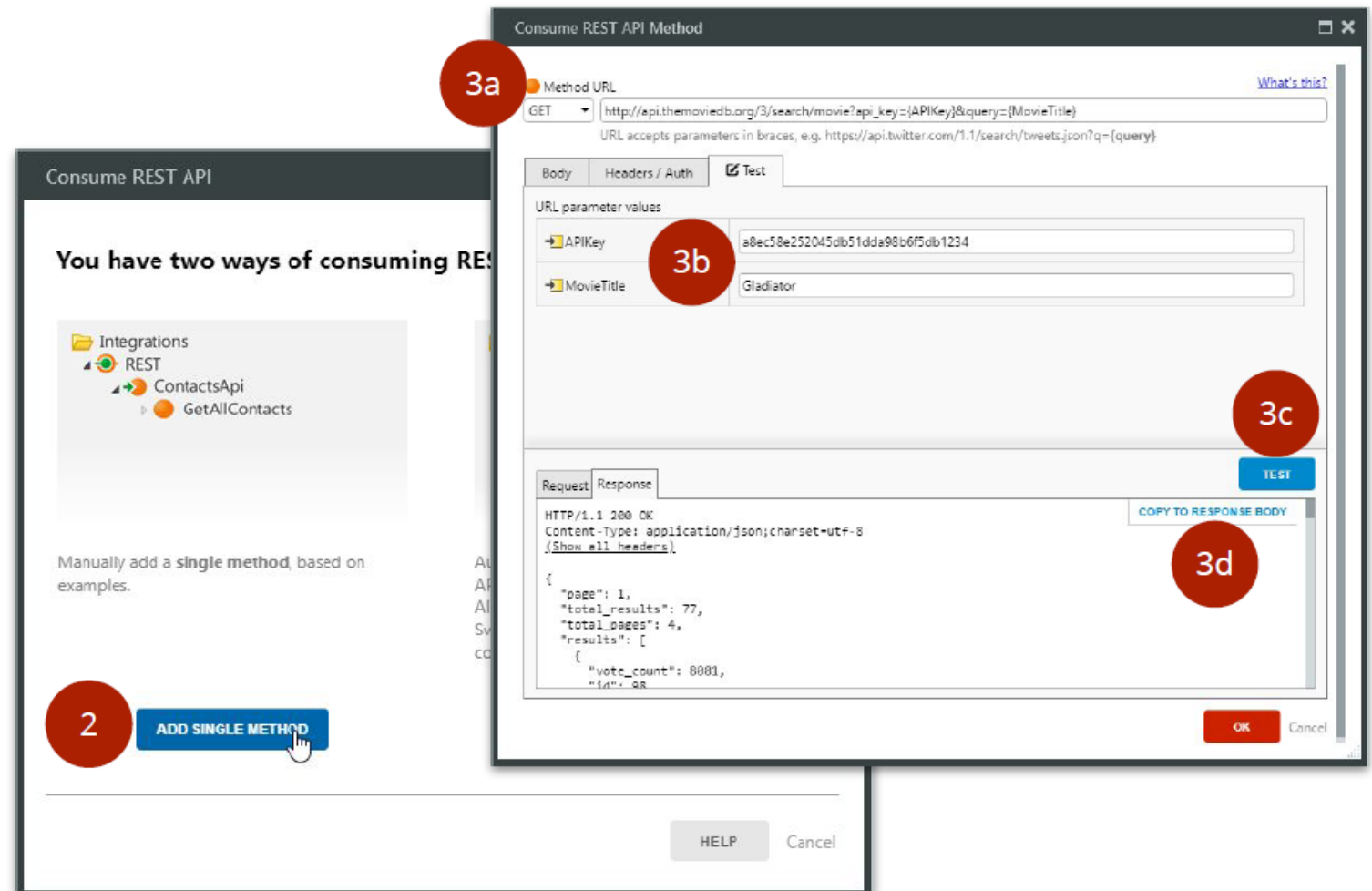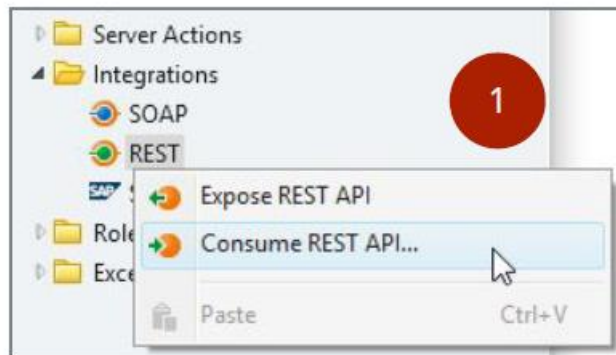- Allow integration between heterogeneous systems

OutSystems simplifies consuming and exposing functionality as standard

- SOAP web services
- REST APIs

Consuming a Single REST method

Consume a single REST method

- Provide the method's URL
- Test to get a sample response
- Copy the response to the Body

Using REST methods

OutSystems generates
- REST methods as Actions
- Compound data types as Structures

The generated elements can be used just like regular Actions or Structures

Possible to change
- Default values of Input Parameters
- Name and description of elements
- **Change data types** of attributes and parameters
  - And also **add and remove them**
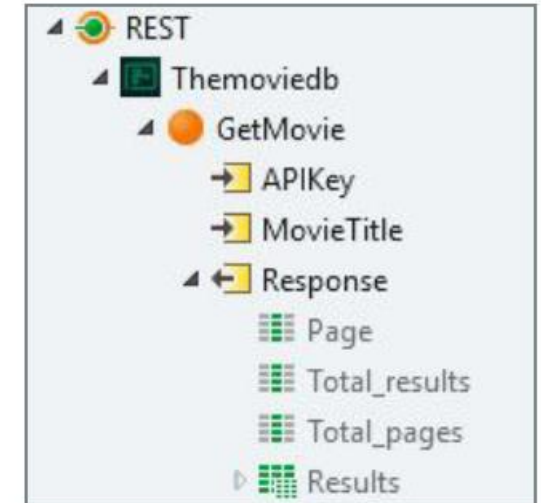
REST Callbacks

REST services provide the following Callbacks
- OnBeforeRequest
- OnAfterResponse

Actions are automatically called before the request or after getting the response

Useful to debug and customize requests
- Detect and locally handle HTTP error statuses (400 and over)
- Alter the sent and return values transparently to the caller code
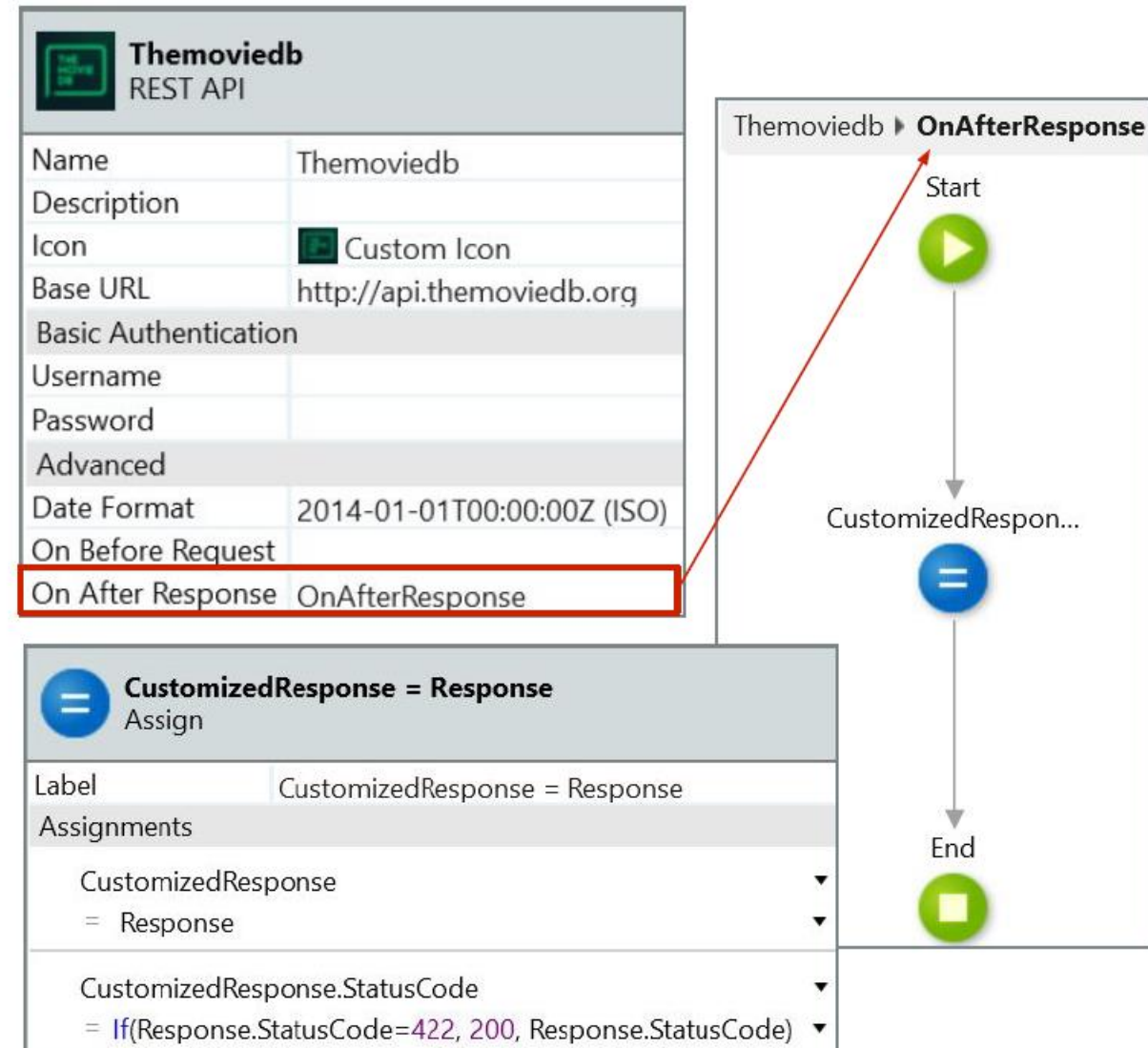
Consuming a REST API

Consume all REST methods

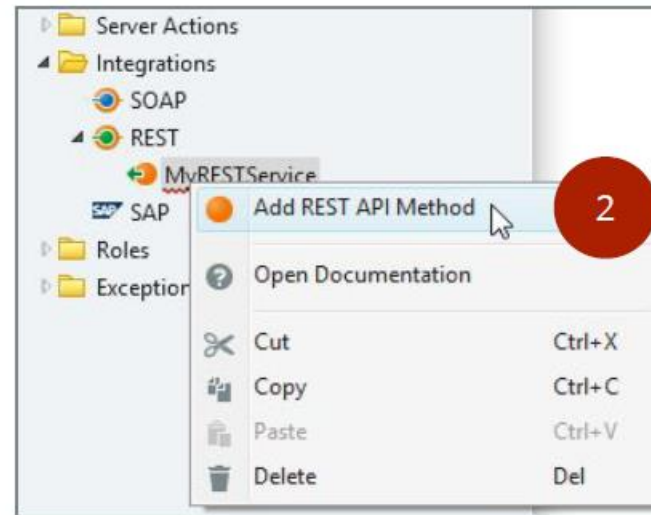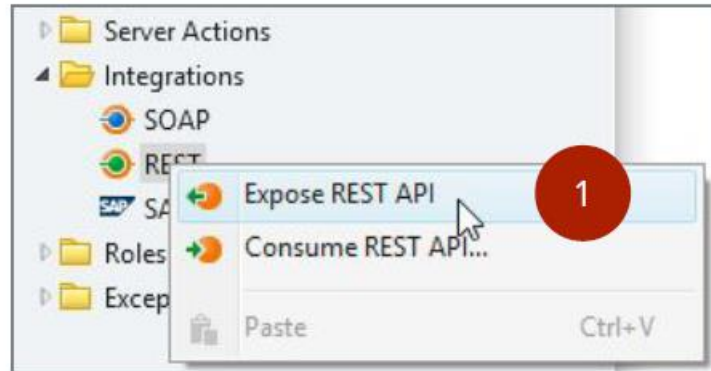● Provide the API URL

● REST API must be compliant with Swagger specification

Exposing REST in OutSystems
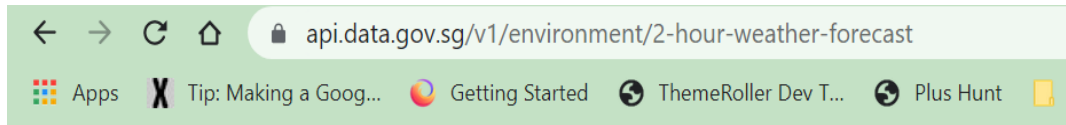
To expose a Service in OutSystems
- Create the Service
- Create each method
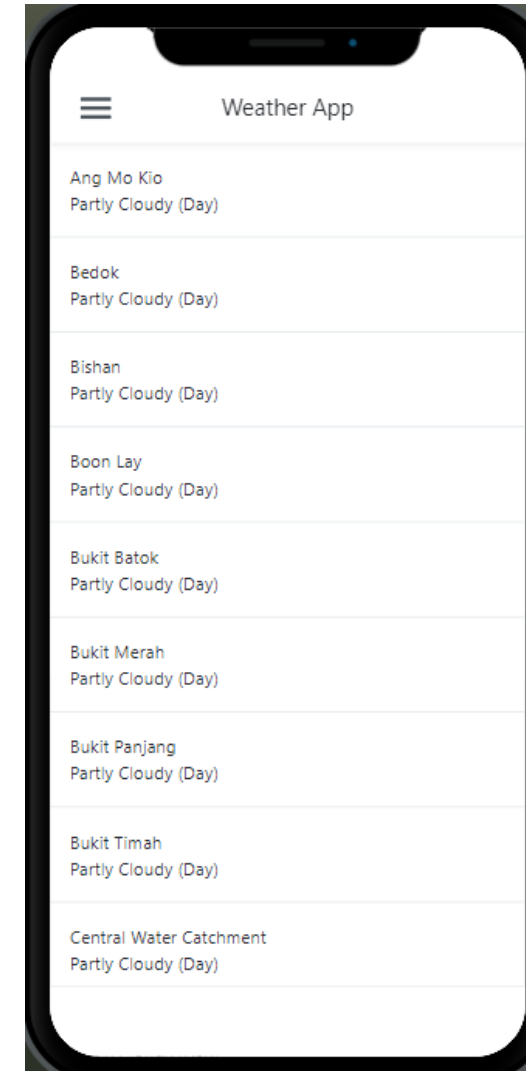- Implement them as any Action
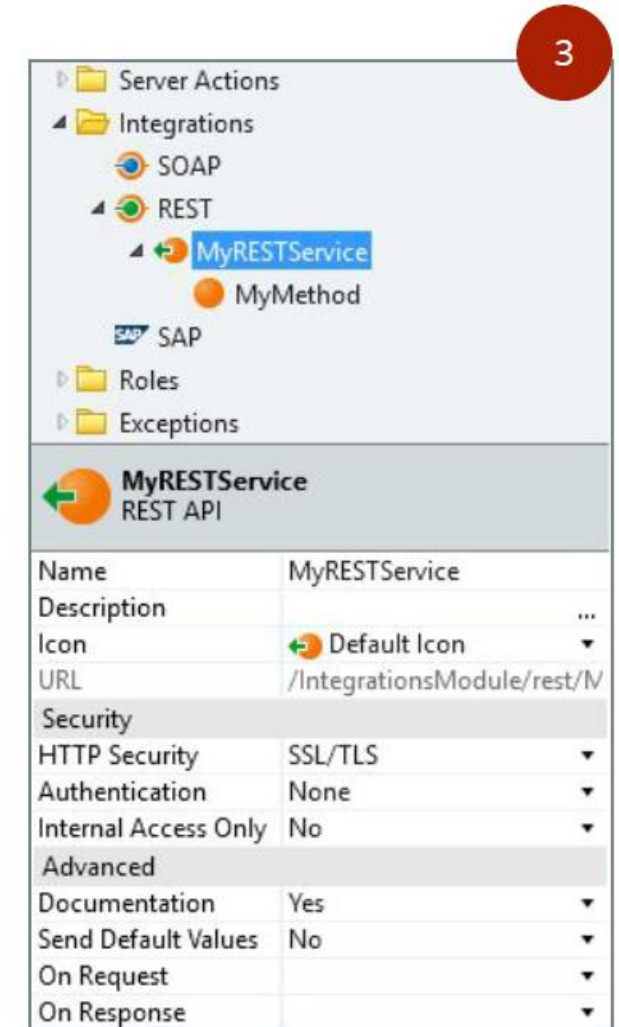
Lab 5: Web Service (JSON)

Get Weather Forecast information from data.gov.sg

● retrieve the region and its weather forecast and present the information in a list

https://api.data.gov.sg/v1/environment/2-hour-weather-forecast

Other Sources of Web Service

- data.gov.sg
  - ➢ Carpark Availability
  - ➢ Taxi Availability

Other Sources of Web Service

- LTA Data Mall
  - ➢ Provide real-time information on transport services

https://datamall.lta.gov.sg/content/datamall/en.html

Lab 5a: LTA Bus Arrival Service (Demonstration)

- Many bus arrival apps in the Apple App store or Google Play store make use of the data provided by LTA.

  - Bus Arrival time for next 3 buses

  - Current location for next 3 buses

  - Seating capacity for next 3 buses
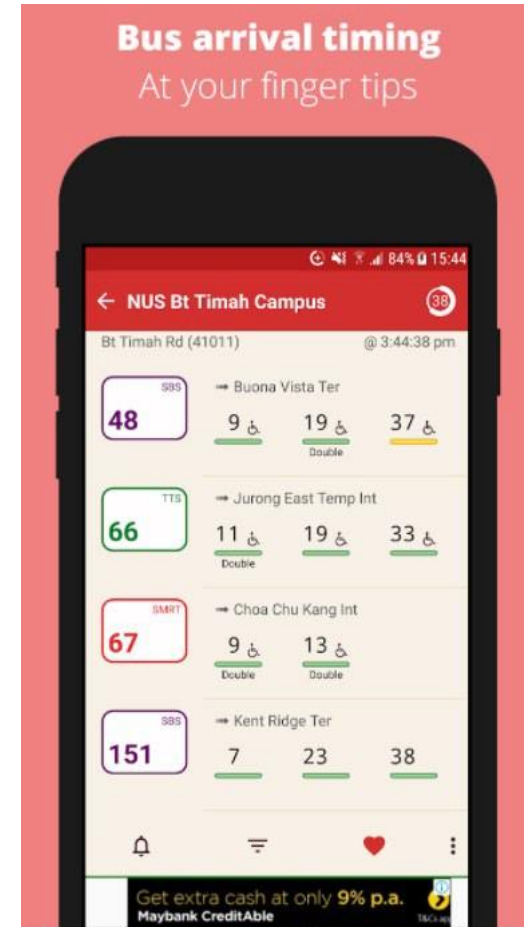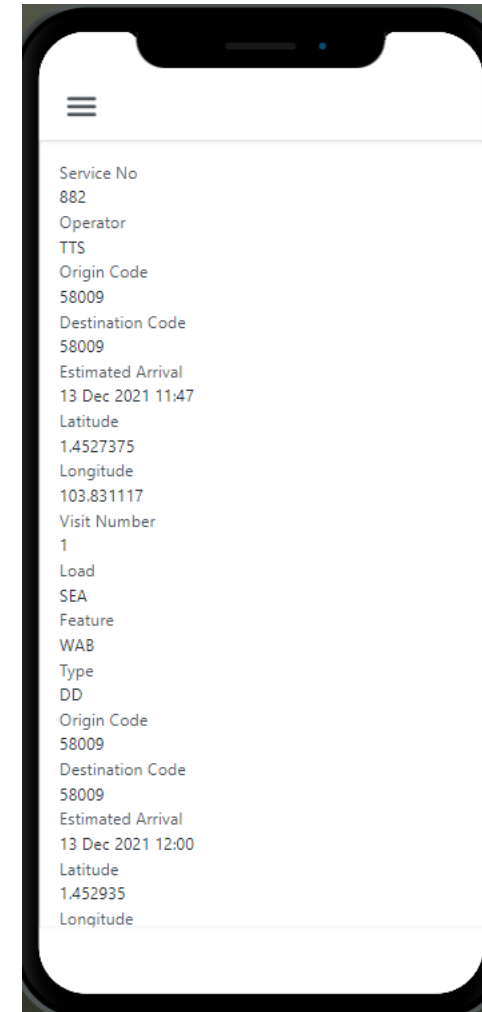
Debugging

Debugging in Service Studio

Place breakpoints on elements that generate code
- Server and Client Actions

Start the debugger before opening the app in the browser
- Service Studio registers the breakpoints
- Debugging can be done using the browser emulator or the device

Breakpoints are listed in the Debug panel
- Can be temporarily disabled
- Can be removed
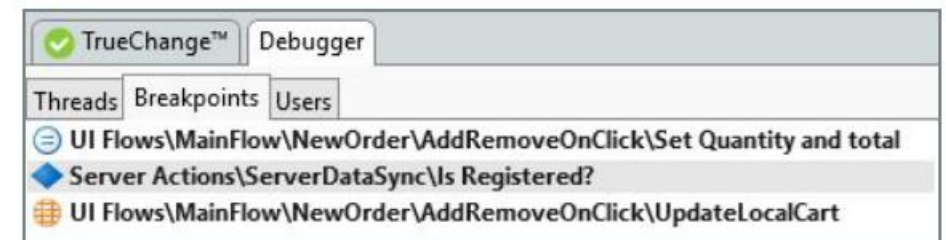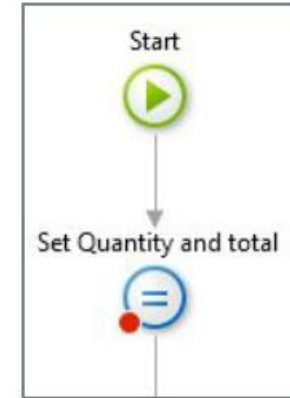
During Debugging

The following commands are available once code execution stops at a breakpoint

Regular debugging operations
- Stop, Continue, Suspend, Abort
- Step Over, Step Into, Step Out

Break on All Exceptions forces the debugger to suspend the execution of threads when exceptions occur
- Handled or unhandled
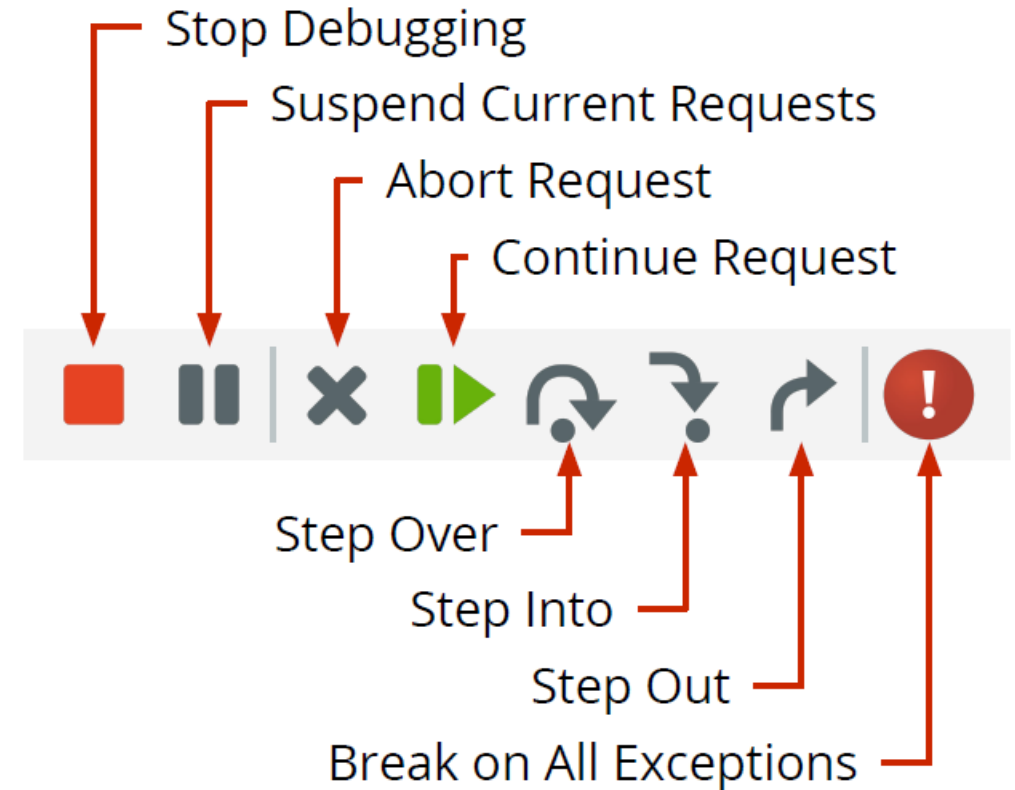
Inspecting Variables during Debugging

Inspect the values of variables when code execution is stopped

- **In Use** by the current code statement
- **Locals** to the current execution scope
- Stored in this Screen's **Widgets**
- Global to the **Site** (i.e. application)
- Selected by the developer for quick access to always be under **Watch**

Watches are always displayed, even if out of scope
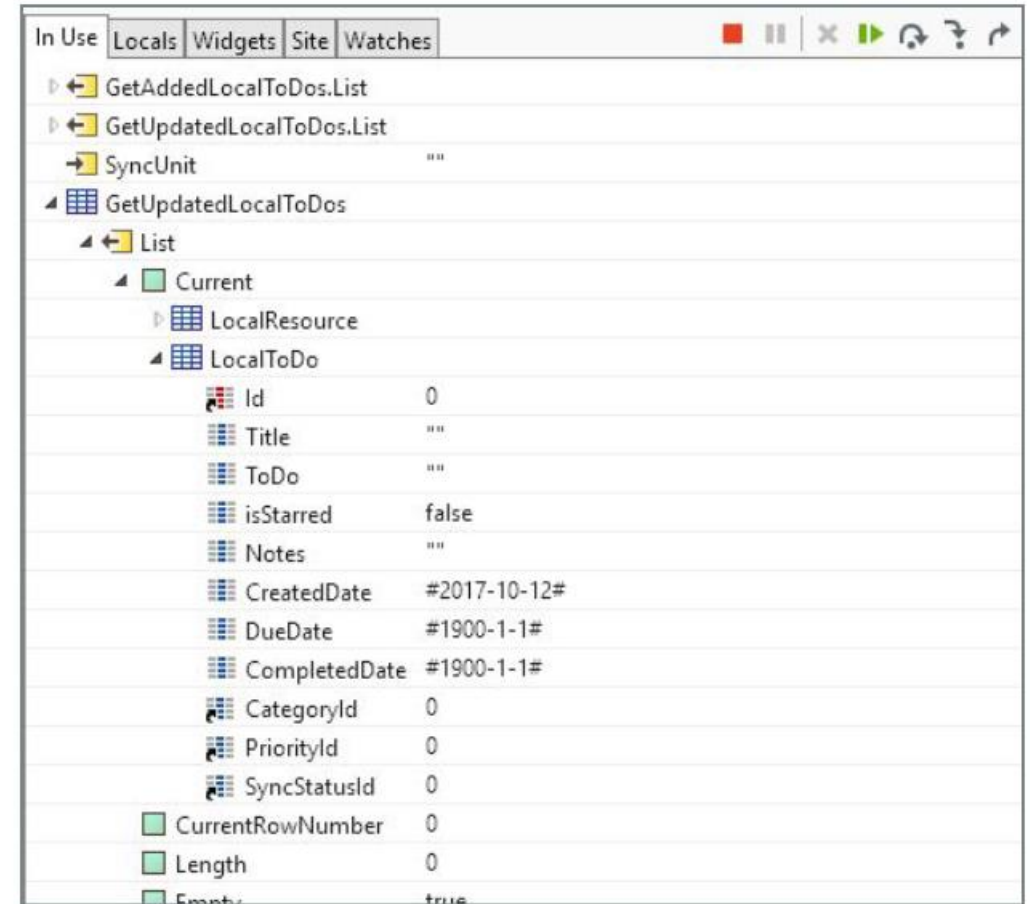
Debugging Options

On Mobile apps there are three debug options:

Emulate using Google Chrome

Android device

iOS device

Outsystems Now can also be used on Android to debug mobile apps running on the device

Testing Mobile Apps

- Google Chrome emulation allows to quickly test mobile apps
  - Inspect the source code
  - Does not test offline and plugin behaviors
  - OutSystems Now on Android is an alternative to debug the app on the device

- Android and iOS Debugging
  - Requires installing the native generated app
  - Connect the device with an USB Cable
  - Allows to better troubleshoot the performance and user experience
    - Offline scenarios
    - Plugin interaction

https://success.outsystems.com/Documentation/11/Developing_an_Application/Troubleshooting_Applications/Debugging_Applications
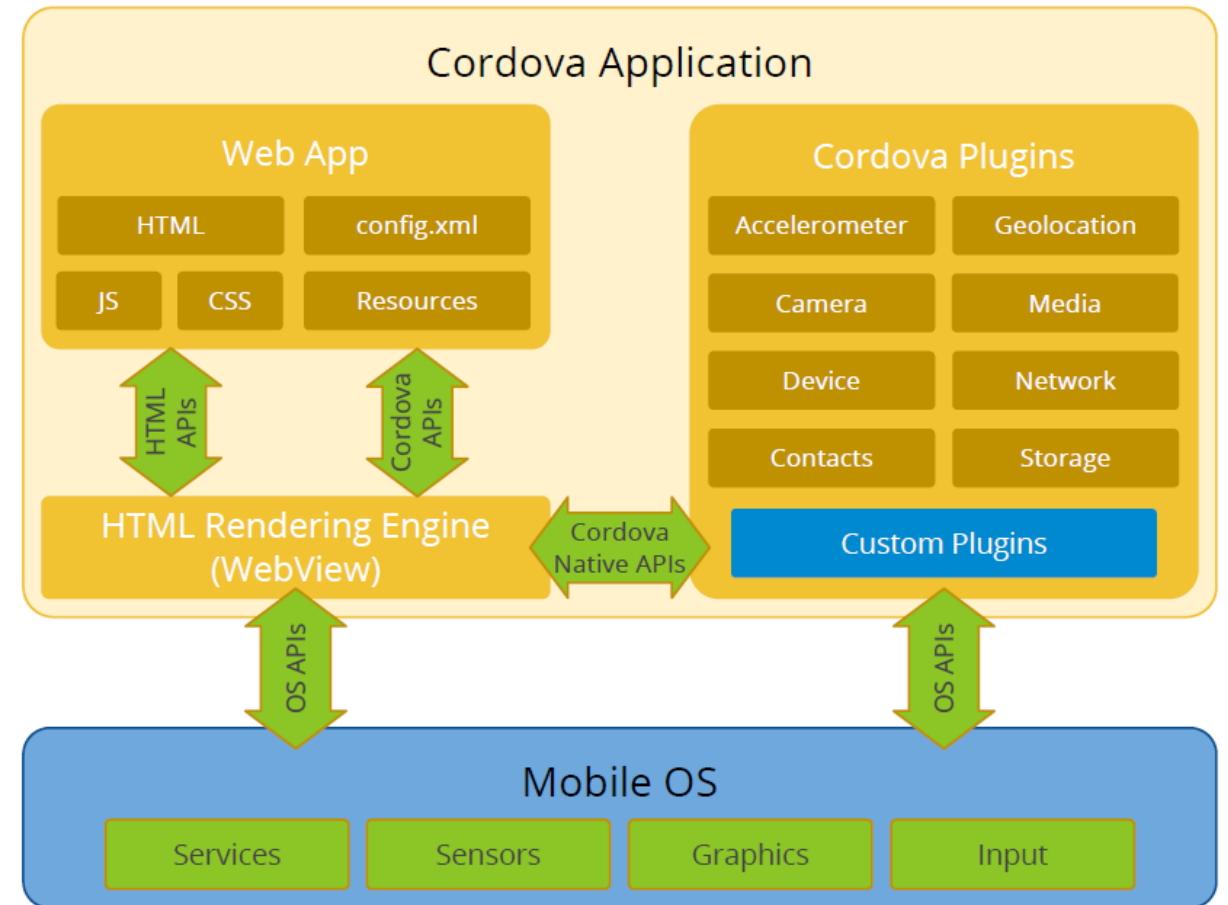
Plugins

Cordova Plugins

- What is Apache Cordova?
  - An open-source mobile development framework that allows the use of standard web technologies for cross-platform development
    - HTML5, CSS3, JavaScript

- What are Plugins?
  - A Plugin is the code that provides the interface between Cordova and native components
    - Allows Cordova to bind to and communicate with standard device APIs
   - Allows native code to be invoked from JavaScript

Cordova Application

- Web App
  - Application code (web page)

- Cordova Plugins
  - Interfaces to device capabilities
  - Core and custom plugins

- Rendering Engine (WebView)
  - Browser-based rendering

- Mobile OS
  - Sensors, input, graphics, services

Plugins are Available on the Forge

- Plugins are available for different platforms
  - Mobile
  - Reactive
  - Service
  - Web

- Search and Install Plugin in order to use the plugin in your app
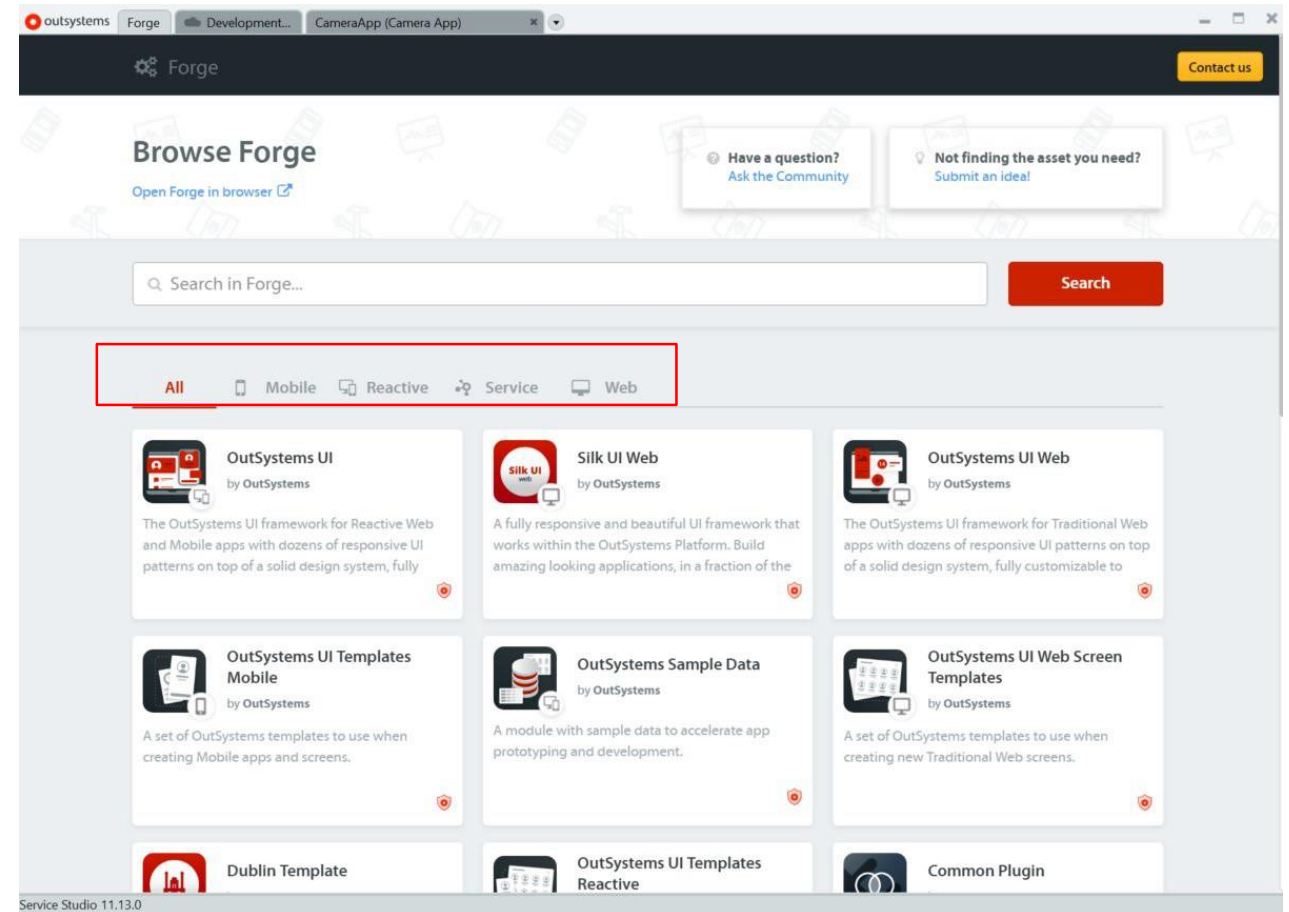
Plugin Details

Available Plugins

Camera

Access the camera capabilities

Contacts

Access to contacts/address book

Calendar

Access to the calendar

Location

GPS information (lat, lon, alt)

Key Store

Store small amount of sensitive data (encrypted)

Ciphered Local Storage

Ciphered local storage database

Touch ID

Fingerprint authentication

Local Notifications

Notifications from the app while it is in the background

Pushwoosh

Push notification using One Signal

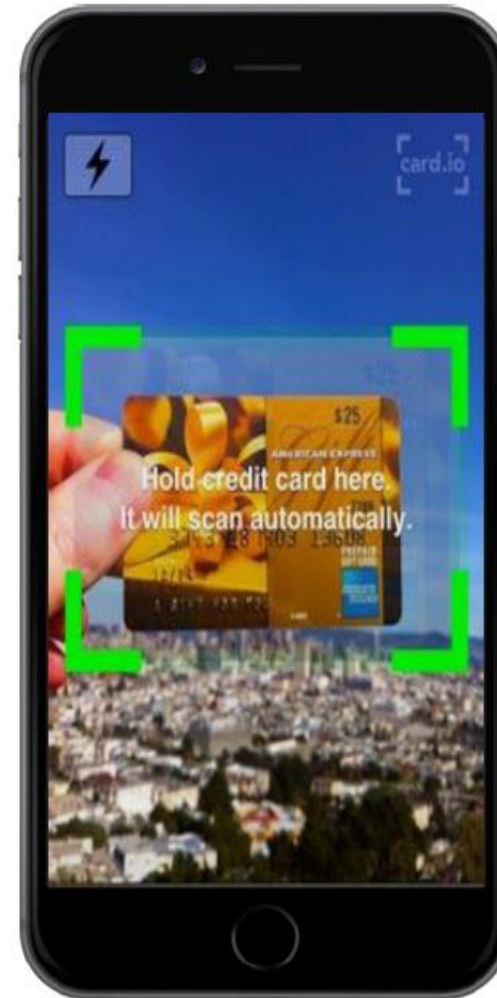**Barcode scanner**

Scans barcodes & QR codes

In App Browser

Open external URLs in the app

Audio, Barcode, CardIO, & E-mail examples

Using Plugin: Add Dependency to Project

- Install Plugin to add them to your personal development environment

- After installation, add the plugin as dependency to the project using the plugin.
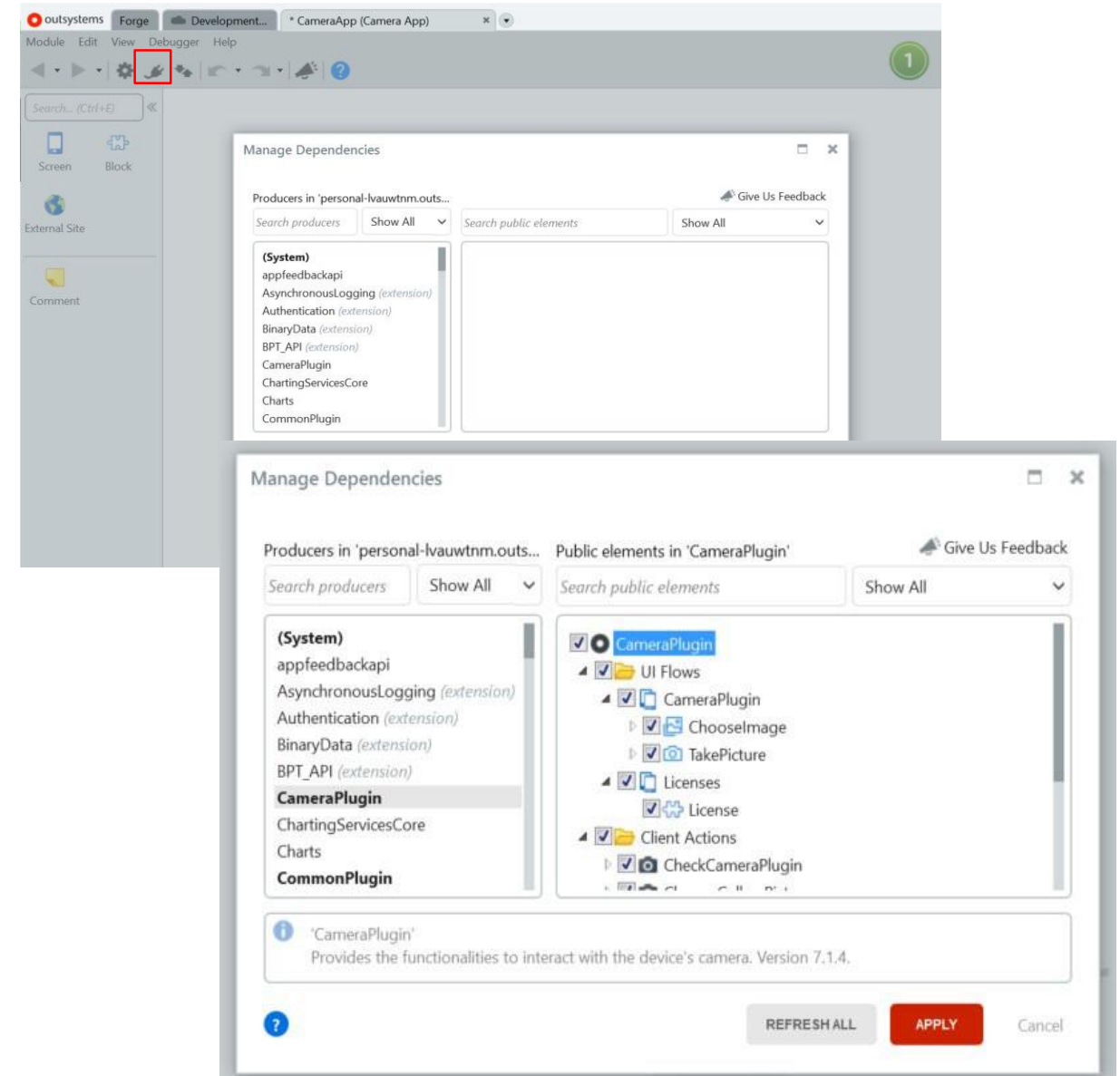
Camera Plugin Details

- Provide Access to
  - Camera
  - Photo Gallery

- The Camera plugin provides the Interface and Logic code to speed up development process
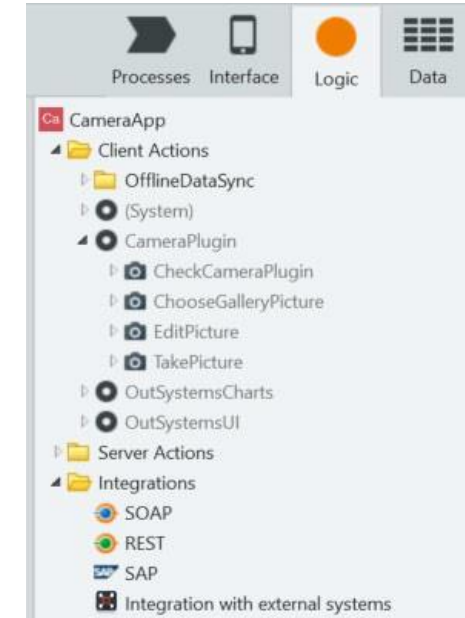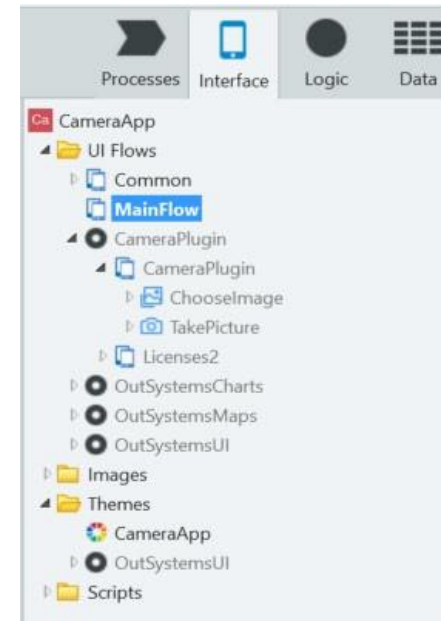
Link to documentation

Camera Plugin: Taking Picture

- Workflow for taking picture

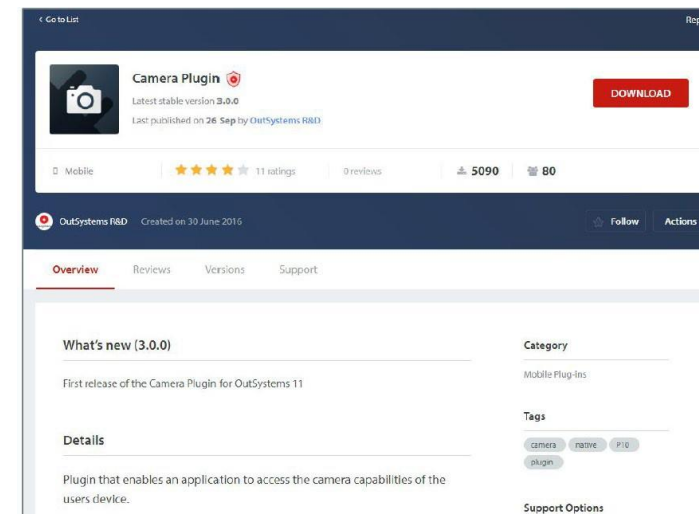 a. Check for availability of camera plugin

  b. Take Picture

  c. Check whether picture is taken successfully

  d. Save the image data to a variable
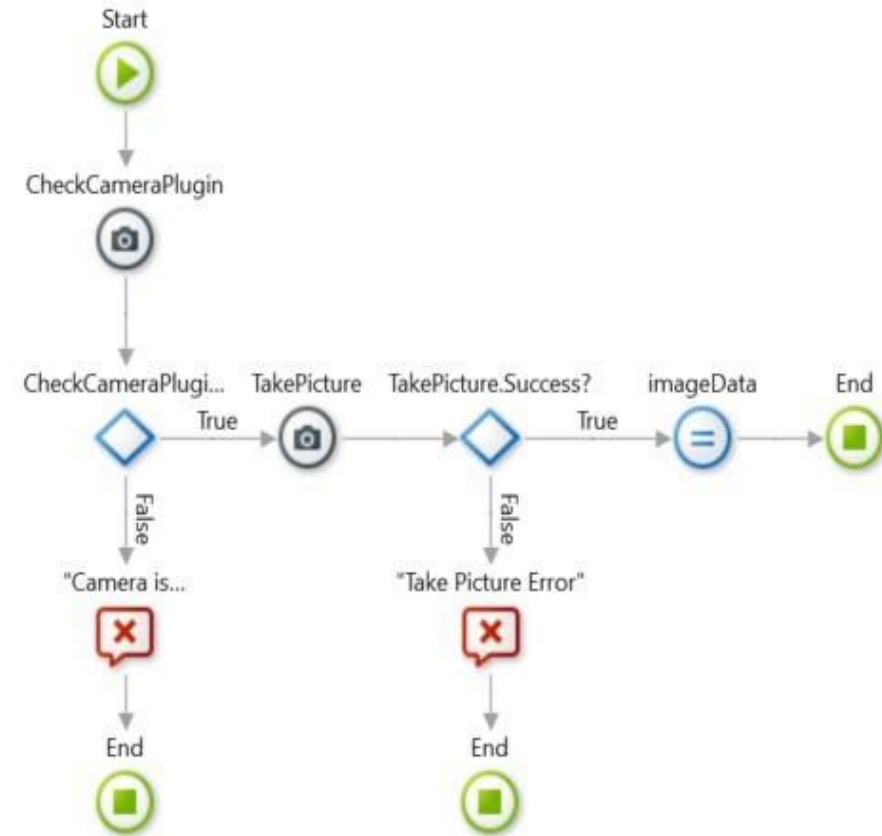
Exercise Lab 6: Camera Plugin App

- Install Camera Plugin

- Add dependency to project

- Use the Camera Plugin to take a picture

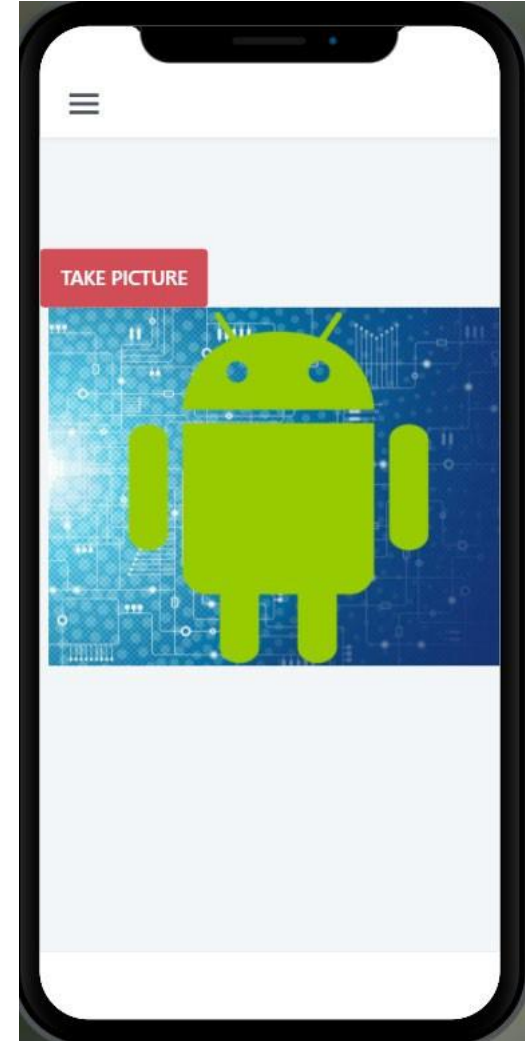# Barcode Plugin Details

- Scan barcode and QR code

- The Barcode plugin provides the Interface and Logic code to speed up development process

The following list shows which barcode formats the plugin can read.

- UPC-A
- UPC-E
- EAN-8
- EAN-13
- ISBN-10
- ISBN-13
- ISBN-13 Dual Barcode
- Code 39
- Code 93
- Code 128
- GS1 DataBar
- ITF-14
- Codabar
- QR Code
- PDF 417
- Data Matrix
- Aztec Code

Forge   Contact us

ℹ Version **5.0.3** was automatically selected as the **latest stable** for your environment running OutSystems 11   ✖

‹ Go to list

Barcode Plugin 🛡   ✔ Installed
Stable version **5.0.3** (Compatible with **OutSystems 11**)
Other versions available ⧉   Install demo...
Published on **5 Nov** by **OutSystems**

Link to documentation

Barcode Plugin: Scan QR

- Workflow for scanning barcode
  a. Check for availability of barcode plugin
  b. ScanText
  c. Save the text to a variable

Link to documentation
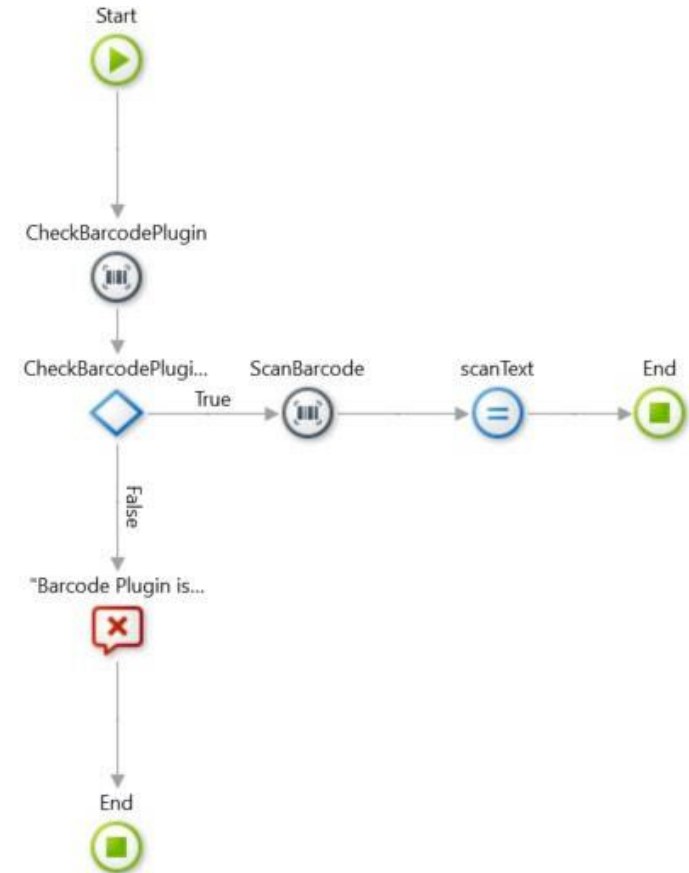
Exercise Lab 7: Barcode Plugin App

- Install Barcode Plugin

- Add dependency to project

- Use the Barcode Plugin to scan a QR code
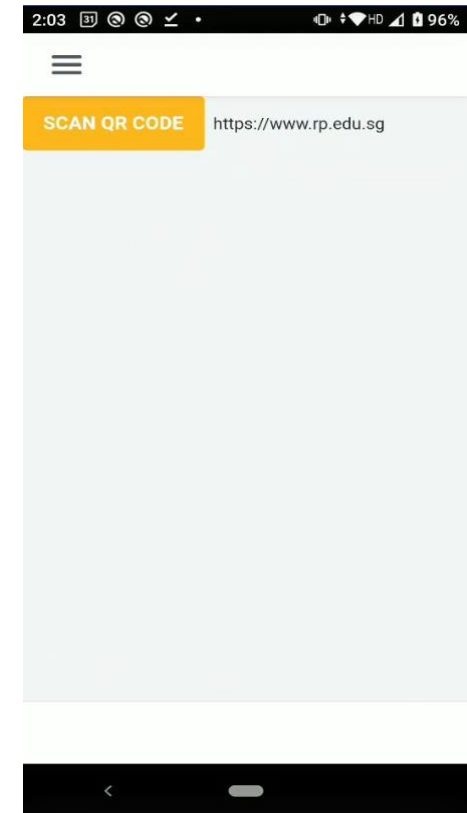
Use cases

A Booking App

Table Tennis Booking Record

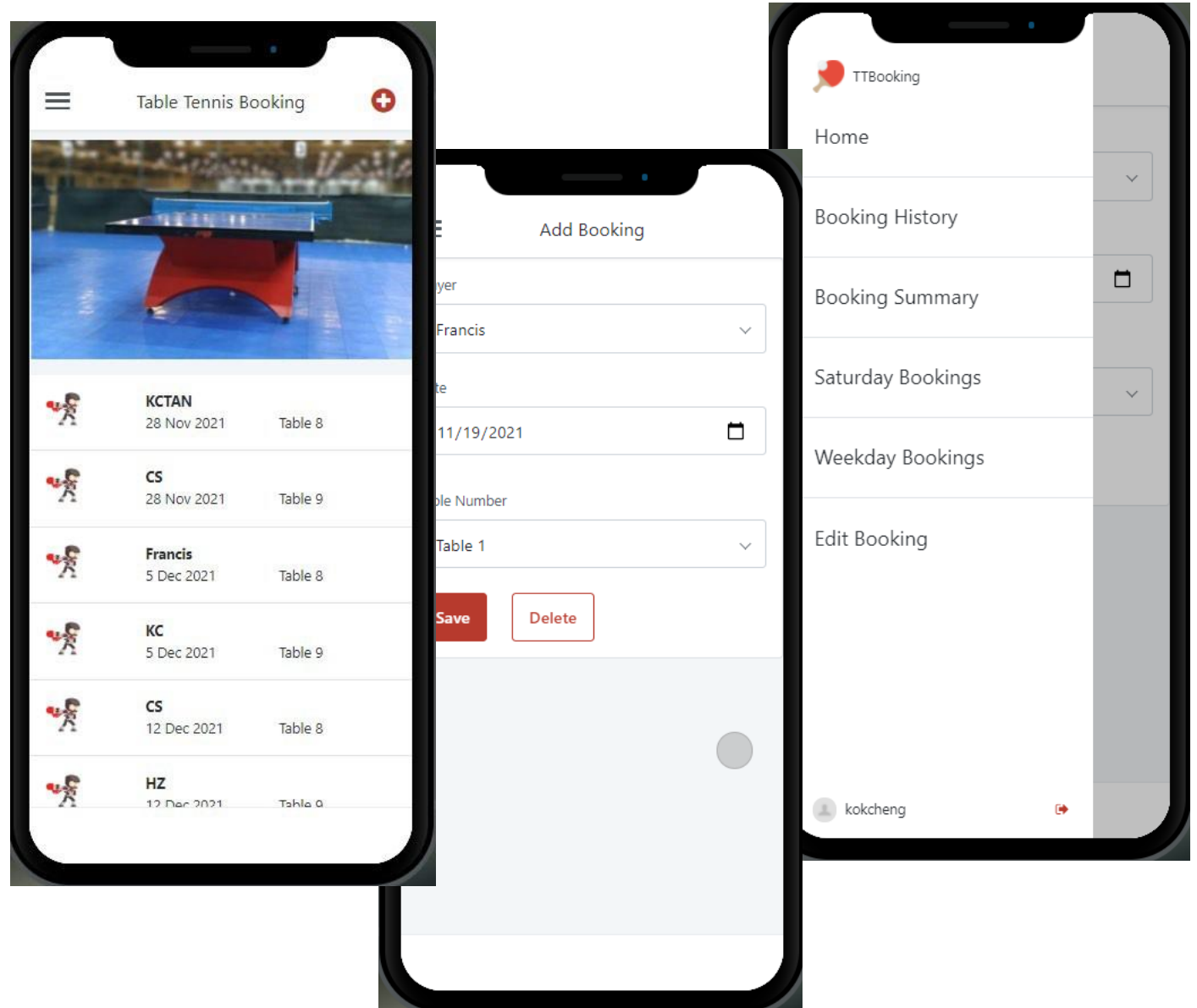- Booking done 2 weeks in advance

- Record of Hirer

- Record of table number

Use case: GRIT App

FCM offered by SHL: Grow with G.R.I.T

Current Situation:

1. Each student taking the FCM is required to complete a survey in Google Form

2. The google form response is downloaded, and the responses are processed using a python script.

3. Each student will receive an email with the processed result of the survey that they have done at the end of the class.
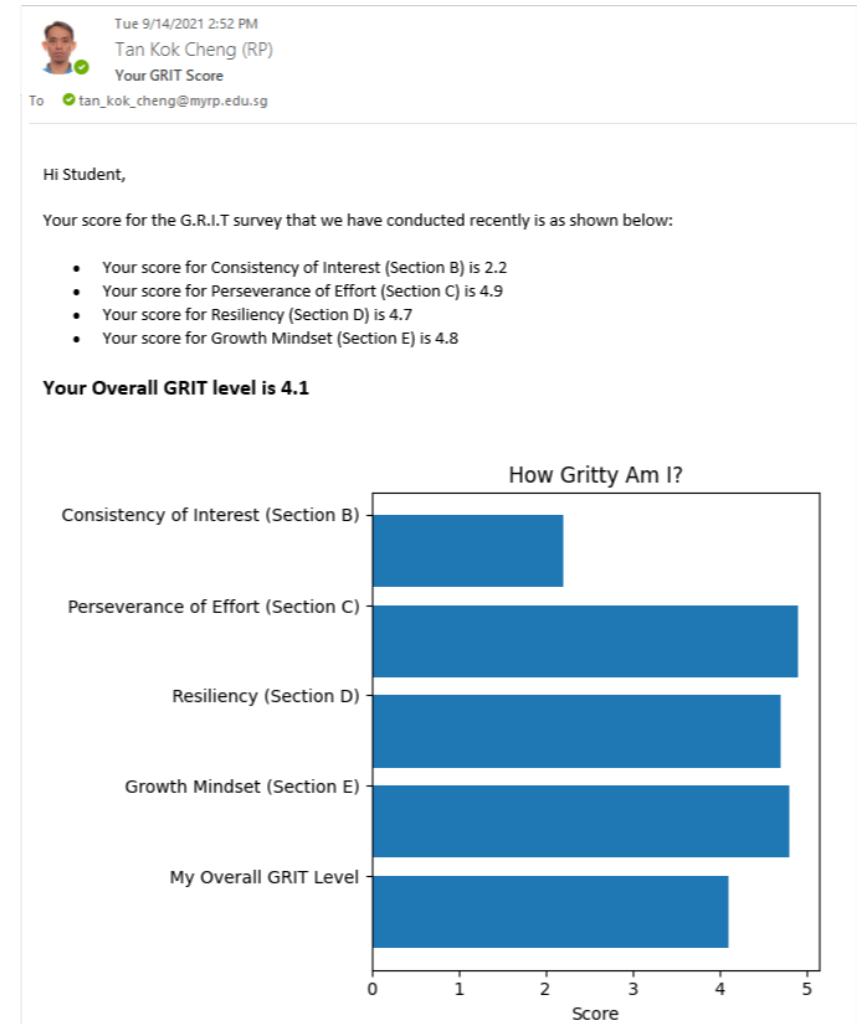
Lab 8: GRIT App

Advantage of the GRIT App:

- Student will be able to see their result immediately after filling up the form.

Skill Set Applied

- Import of Excel Data
- Sorting of Data
- Use of Bar Chart (New)

Use case: Fault Reporting App

- The app allows user to report any fault they noticed by writing a short description and taking a photo of the situation.

- Same techniques can be applied to other similar use-cases that require form submission with photos.
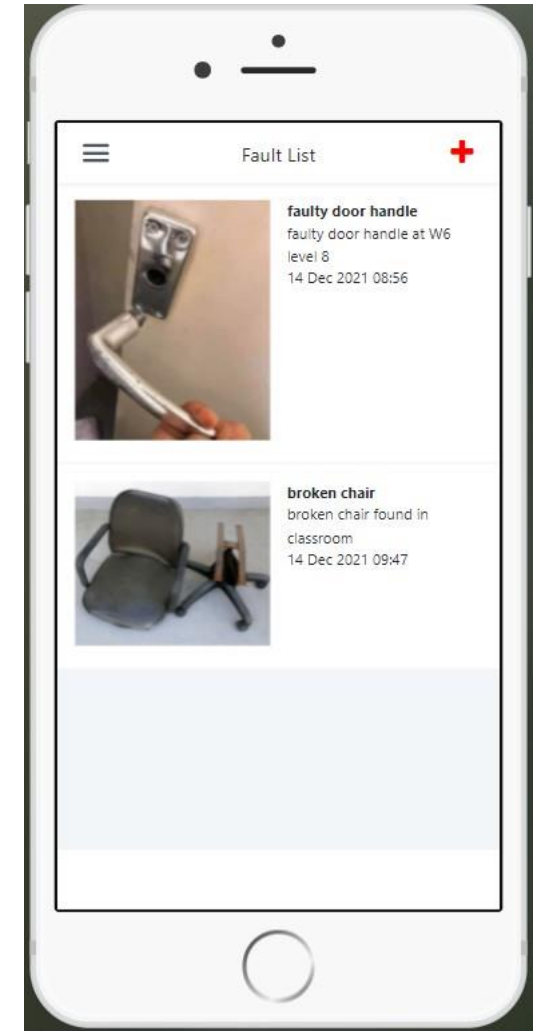
Lab 9: Fault Reporting App

- Import of Excel Data

- Adding additional fields (Date Time and Binary Data) to the generated entity

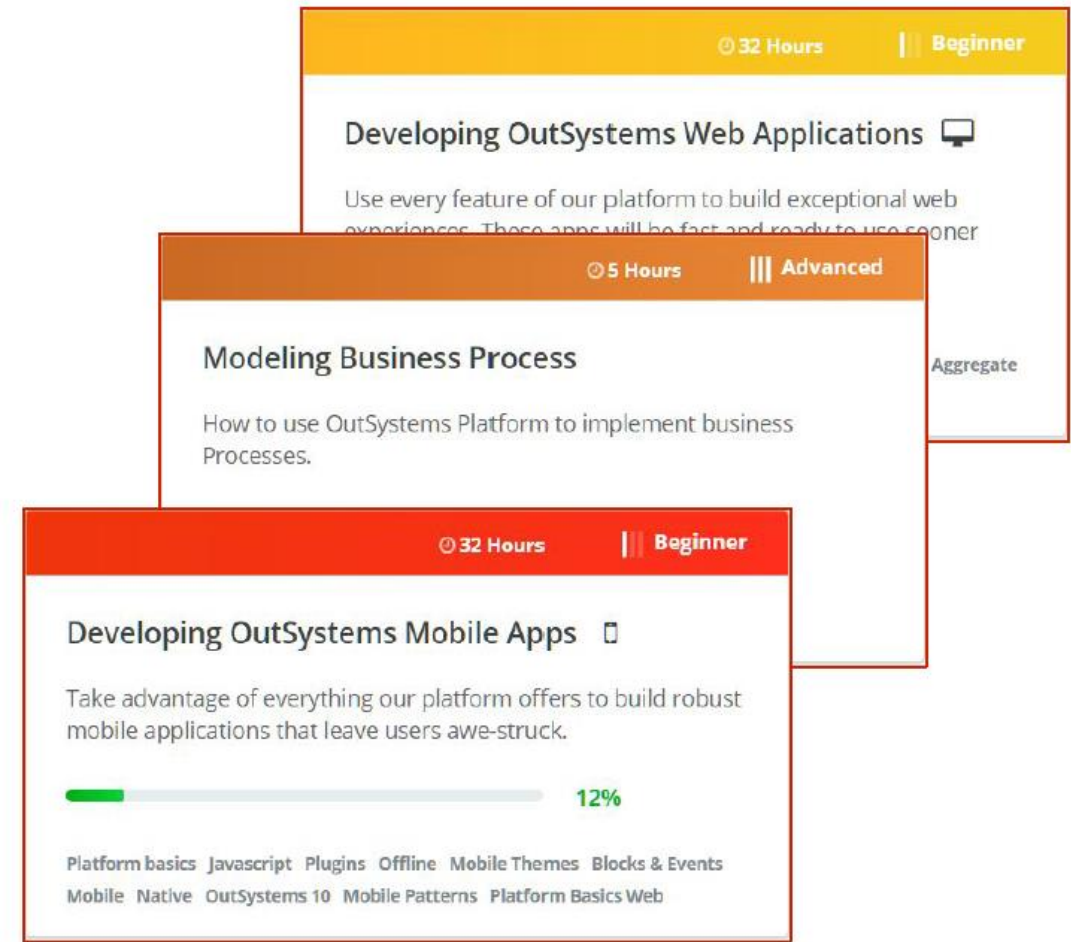- Use of Camera Plugin to take photo or select photo from the photo gallery
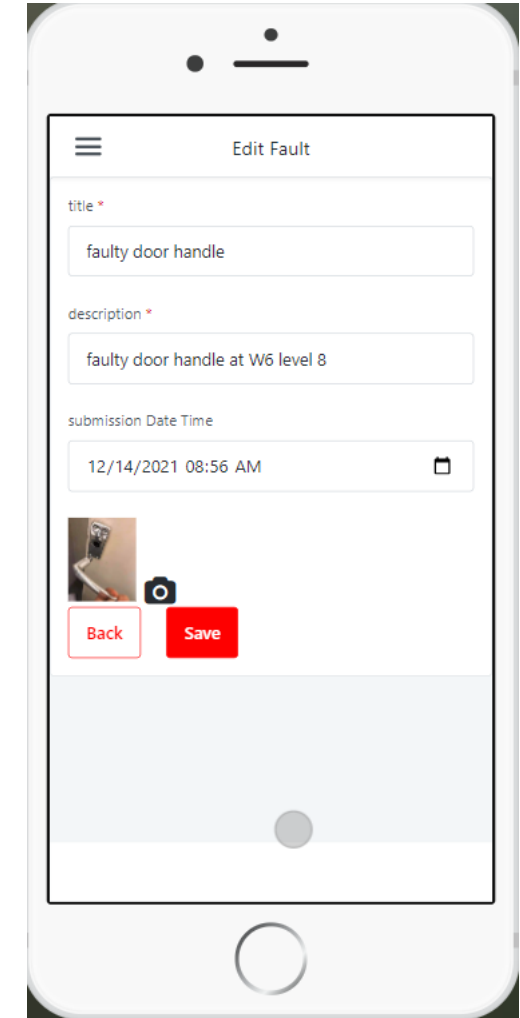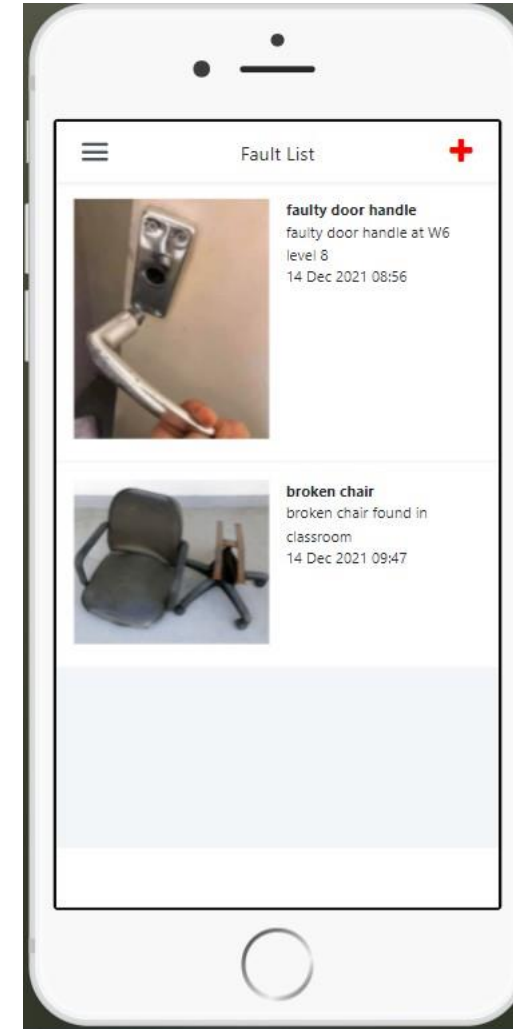
Course wrap up

Online Training

- Developing OutSystems Mobile Apps
- Developing OutSystems Web Apps
- Modeling Business Process
- … and more!

More advance training may be offered
In **RP** too!

Check https://www.outsystems.com/learn/courses/
for all available online courses on OutSystems platform

OutSystems Certification

Web Developer certification levels
- Associate
- Professional

Mobile Developer certification
- Associate

Advanced Certifications
- Associate Tech Lead
- OutSystems Expert

http://www.outsystems.com/learn/certifications

Thank you!