EIS11 PBBA Branded iOS Merchant Button

Implementation Guide

September 2019

Document Version 3.12.3

GitHub Merchant Library Version 3.1.0

Release R3.1

Document History

Version		Date	Summary of Changes
Was	Now		
2.0	1.0	19-01-2016	Draft
2.1		21-01-2016	Updated to include all feedback, R2P3 compatible
-	2.2	20-05-2016	Released to support Pay by Bank app live service
2.5	2.3	27-06-2016	Updated to include review feedbacks
2.6	2.4	05-07-2016	Update co-branding assets description and add the requirements for custom schemes support.
2.7	2.5	21-11-2016	Updated diagrams, more detailed description
3.0		30-11-2016	Participant review and final draft
3.1		01-12-2016	Added integration details for Swift projects
3.2		07-12-2016	Participant review and final draft
3.3		15-02-2017	Add new PBBA configuration key
3.4		01-03-2017	Updated Custom to Integrated
4.0	3.5	03-05-2017	● Document format revised for R3 ● Corrected version of library published to GitHub
3.6		01-07-2017	Changes to this version: ● Document History revised to ensure versions align to Releases ● Figure 2 - App Picker – image updated ● Section 3.1.2 Supported Languages – Revised to include Objective-C, Swift 2.3 and Swift 3.0 ● Section 3.2 Source code – Note added ● Appendix A.1.1 Button configuration – Theme titles revised and additional explanatory text added below the button images ● Appendix A.2 Hybrid Merchant Apps – Added
3.7		23-10-2017	Note added clarifying the polling mechanism on: ● Section 2.2 – M-COMM journey ● Section 2.3 – E-COMM journey Section 3.3.1 - Updated the CocoaPods integration information Section 3.4 - Update the Pay by Bank Branded iOS Merchant Button Library in a Merchant application - Added
3.8		01-11-2017	Released to support Pay by Bank app R3 live service.
3.9 - 3.11		01-10-2018	Document version omitted to align with Pay by Bank app Release 3.1

Version		Date	Summary of Changes
Was	Now		
3.12		08-10-2018	Released to support Pay by Bank app R3.1 live service.
3.12.1		17-12-2018	Changes to this version: • Section 4.2.1 – Configure the button – removed. • Section 4.2.2 – Include the button – Heading removed. • Appendices A.1 – Pay by Bank app Button and pop-up configuration – removed.
3.12.2		27-05-2019	Changes to this version in relation GitHub Merchant Library Version 3.0.0: (as Published in June 2019) • Section 1.1 – Introduction - Note on Level AA standard - added • Section 3.1.1 – Certified devices and POS versions – table updated • Section 3.1.2 – Supported languages – revised for clarity • Section 3.2 – Source code- link to GitHub - amended • Section 3.4.1 – Updated the library using CocoaPods- revised for clarity • Section 3.5.1 - Pay by Bank app Button component- description and screenshot revised for clarity • Section 3.5.2.1 - M-COMM pop-ups - last paragraph added • Section 3.5.2.2 - E-COMM pop-ups description and screenshot revised for clarity • Section 3.5.2.3 - Error pop-ups - revised for clarity • Section 3.5.2.4 - Network error pop-ups - added • Section 3.5.2.5 - Request expired error pop-ups - added • Section 3.5.2.6 - Pay by Bank app code generation error pop-ups - added • Section 3.5.2.7 - More about Pay by Bank app pop-ups • Section 4.2 - Set up Pay by Bank App Button - @end - PBBA Button size changed to 320x89 points • Section 4.3.3.1 - Integrate pop-up for Pay by Bank app M-COMM journey - [PBBAAppUtils showPBBAPopup:popupPresenter secureToken:secureToken brn:brn delegate:popupDelegate]; - removed • Section 5 – Sample code - screenshot revised for clarity
3.12.3		20-08-2019	Changes to this version: • Section 1 - Introduction - Important and Note - revised for clarity • Section 3.2 - Source code:

Version		Date	Summary of Changes
Was	Now		
3.12.3		20-08-2019	○ Revised for clarity ○ Note - removed • Section 3.4.1 - Update the library using CocoaPods - revised for clarity • Section 3.5.1 - Pay by Bank app button component - ○ Revised for clarity ○ Note - added • Section 3.5.2.2 - E-COMM pop-ups - Note - added • Section 3.5.2.6 - Pay by Bank app code generation error pop-ups - Note - added • Section 3.5.2.7 - More about Pay by Bank app pop-ups - Note - added

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1 About this document

1.1 Introduction

This documentation describes the Pay by Bank app (PBBA) Merchant Button Library for the iOS Applications. The document focusses on the Pay by Bank app Branded iOS Merchant Button Library behaviour and code and provides a functional and technical overview for M-COMM and E-COMM customer journeys.

Important This version of EIS11 PBBA Branded iOs Merchant Button Implementation Guide accompanies Version 3.0 of the Merchant Library which is made available to Distributors on an optional basis as described in Section 21 of the *Product and Service Definition* document.

NOTE Merchant Button Library has been tested to Level AA of the WCAG 2.0 standards. To ensure adherence to Level AA it is important the Merchant Button Library is implemented as described within this document.

As set out in Section 21 of the *Product and Service Definition* document, the Operator is contemplating the introduction of functionality to display the logos of CFIs which make available Pay by Bank app through their banking apps alongside the Pay by Bank app paymarque. However, this is a roadmap item of functionality which is not currently available and will only be implemented by the Operator if considered desirable following consultation with Participants on how best to deploy such feature. Whilst the description of the Merchant Library Button and its coding may refer to CFI logo, this functionality has been disabled by the Operator within the Zapp system and, as such, no CFI logos will be displayed unless or until the Operator deploys this feature.

Implementation support is available on request.

1.2 Audience

This document is intended to be used by external Participants to support the implementation and subsequent use of the Pay by Bank app.

1.3 Scope

The scope of this document covers the implementation of the Pay by Bank app Branded iOS Merchant Button.

See section 1.5 Associated documents for more related information outside the scope of this document.

1.4 Document conventions

The following conventions are specific to this document and are used throughout.

Convention	Description
Important	Highlights important text in the document.
Notes	Provides more information about a topic.
Number Title text	Hyperlink to another section in the document.
Italics	Indicates a document name.
`Courier New`	Indicates code / command.

1.5 Associated documents

The following provides additional information on topics covered in this document.

- *Brand Guidelines*
- *PBBA Integrated iOS Merchant Button*
- *PBBA Branded Android Merchant Button*
- *PBBA Integrated Android Merchant Button*
- *PBBA Branded Web Merchant Button*
- *PBBA Integrated Web Merchant Button*
- *Zapp Glossary*

2 Functional overview

2.1 Introduction

The Pay by Bank app (PBBA) iOS Merchant Button supports two different models:

1. Pay by Bank app Branded iOS Merchant Button with Pay by Bank app pop-up

   The standard Pay by Bank app iOS Merchant Button with pop-up. This is covered in this document.

2. Pay by Bank app Integrated iOS Merchant Button with Pay by Bank app pop-up

   Merchants and Distributors can integrate their payment button with the Pay by Bank app Integrated Web Merchant Button. The additional considerations are covered in the *PBBA Integrated iOS Merchant Button Implementation Guide* document and should be consulted alongside this document.

Contact your Distributor for any Distributor specific implementation updates or amendments.

2.2 M-COMM journey

The Merchant App and the Pay by Bank app CFI App are on the same device. A sample Consumer journey includes the following steps:

- The Consumer taps a Pay by Bank app Button which starts the payment. This document covers the standard Pay by Bank app Branded Merchant Button only:
  - If this is the first time Pay by Bank app has been used on the device and there is at least one Pay by Bank app enabled CFI App installed on the device then the Pay by Bank app pop-up will appear asking the Consumer to either continue his payment on the same device by pressing “Open banking app” or get the PBBA Code to pay on another device.
  - If this is not the first payment on the device and the user has selected open banking app from before, The Pay by Bank app enabled CFI App on the device is directly invoked.
  - If there are multiple mobile banking apps then a choice of which one should open will be dealt with by the custom iOS App Picker which will be implemented by CFI app.
- The Consumer can approve or cancel the Transaction.
- When the payment has been completed, the Merchant app displays the payment confirmation page

The following sequence diagram shows the interaction between the components of the M-COMM journey.

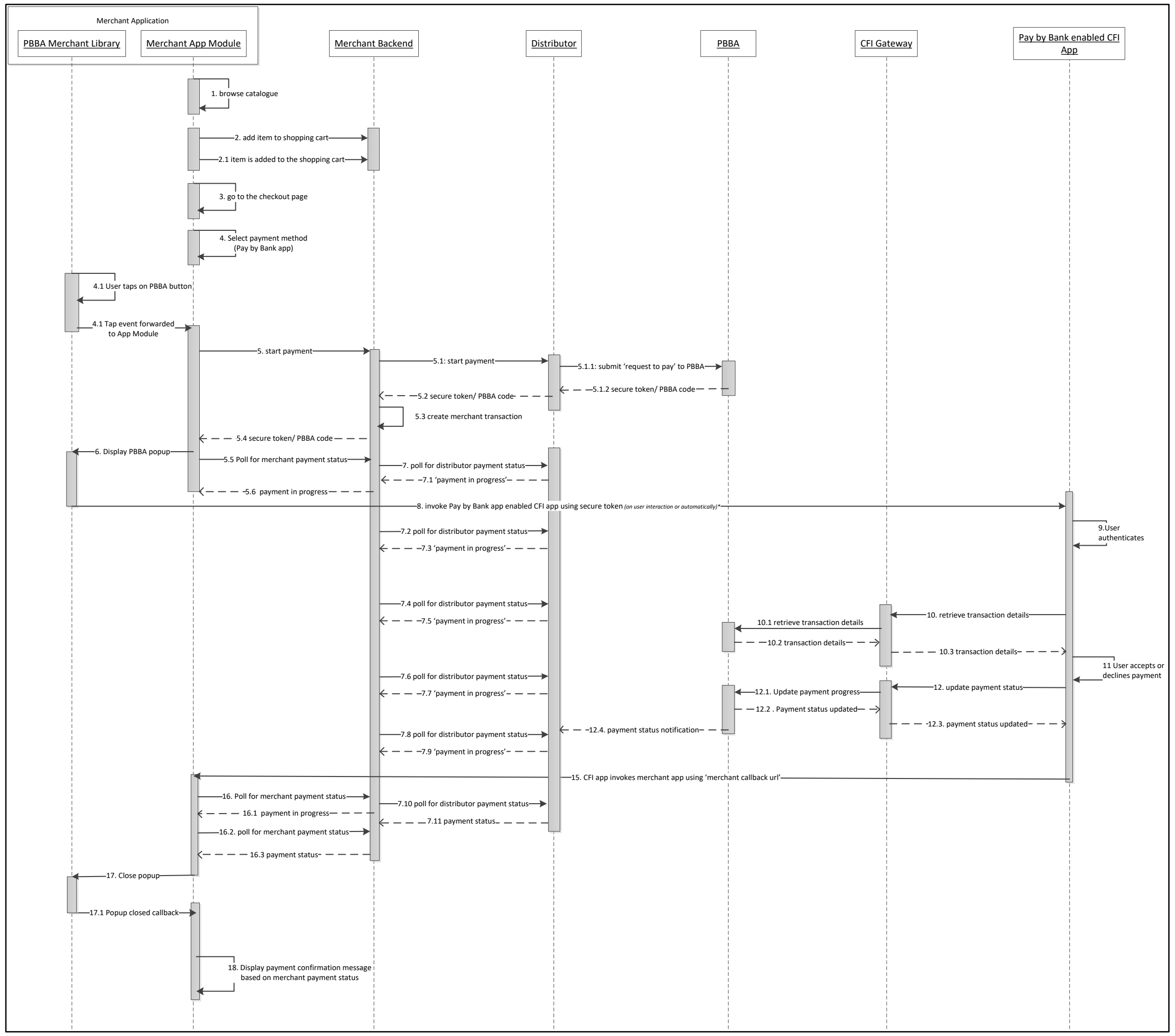

Merchant Application
PBBA Merchant Library
Merchant App Module
Merchant Backend
Distributor
PBBA
CFI Gateway
Pay by Bank enabled CFI App
1. browse catalogue
2. add item to shopping cart
2.1 item is added to the shopping cart
3. go to the checkout page
4. Select payment method (Pay by Bank app)
4.1 User taps on PBBA button
4.1 Tap event forwarded to App Module
5. start payment
5.1: start payment
5.1.1: submit 'request to pay' to PBBA
5.1.2 secure token/ PBBA code
5.2 secure token/ PBBA code
5.3 create merchant transaction
5.4 secure token/ PBBA code
6. Display PBBA popup
5.5 Poll for merchant payment status
7. poll for distributor payment status
7.1 'payment in progress'
5.6 payment in progress
8. invoke Pay by Bank app enabled CFI app using secure token (on user interaction or automatically)*
9.User authenticates
7.2 poll for distributor payment status
7.3 'payment in progress'
7.4 poll for distributor payment status
7.5 'payment in progress'
10. retrieve transaction details
10.1 retrieve transaction details
10.2 transaction details
10.3 transaction details
11 User accepts or declines payment
7.6 poll for distributor payment status
7.7 'payment in progress'
12. update payment status
12.1. Update payment progress
12.2 . Payment status updated
12.3. payment status updated
12.4. payment status notification
7.8 poll for distributor payment status
7.9 'payment in progress'
15. CFI app invokes merchant app using 'merchant callback url'
16. Poll for merchant payment status
7.10 poll for distributor payment status
16.1 payment in progress
7.11 payment status
16.2. poll for merchant payment status
16.3 payment status
17. Close popup
17.1 Popup closed callback
18. Display payment confirmation message based on merchant payment status

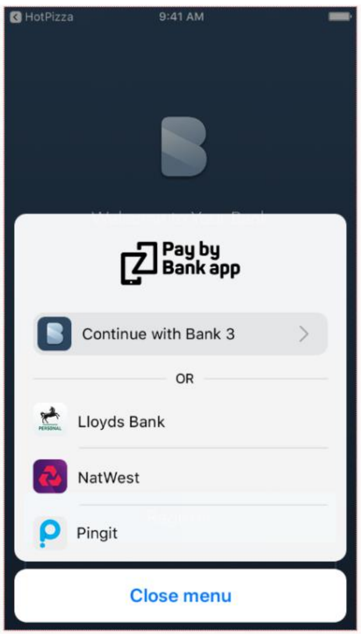
Figure 1: Interaction between the components of the M-COMM journey

Step 8 “Invoke Pay by Bank app enabled CFI App using a secure token” describes the action when the Merchant Library opens the CFI App. In the case of a first time payment, this action happens when the Consumer taps on the `Open Banking app’ button displayed on the M-COMM pop-up. The Merchant Library automatically opens the CFI App, and no user interaction is required.

Note The polling mechanism depicted in Figure 1 is as an example implementation only. If polling is used, appropriate decoupling should be implemented between the website and backend, to support completion of a payment in case of polling failure in the website/application. Since PBBA uses a push based mechanism, it is recommended that push based mechanism is used between the Distributor and the Merchant. The Merchant should contact their Distributor for any Distributor specific implementation updates, API definitions or amendments.

2.2.1 App Picker

Where more than one Pay by Bank app enabled CFI App is installed on the same device as the Merchant App, an App Picker is displayed (see Figure 1: Interaction between the components of the M-COMM journey Figure 2 below) where the Consumer can select which CFI App they would like to use to complete the Pay by Bank app payment.



Sample Screen of Native iOS App Picker with two demo CFI Apps (Bank Too and Bank 3)

Figure 2: App Picker – sample screen

2.3 E-COMM journey

The Merchant App and the Pay by Bank app CFI App are on different devices.

A sample Consumer journey includes the following steps:

- The Consumer selects a Pay by Bank app method and taps the button which starts the payment
- The Merchant App displays a six letter Pay by Bank app code
- On another device, the Consumer opens a Pay by Bank app enabled CFI App and enters the six letter Pay by Bank app code to retrieve the Transaction
- The Consumer can approve or cancel the Transaction
- When the Consumer completes the payment journey on the CFI App, the Merchant App (on the first device) displays the payment confirmation page

The following sequence diagram shows the interaction between the components of the E-COMM journey.

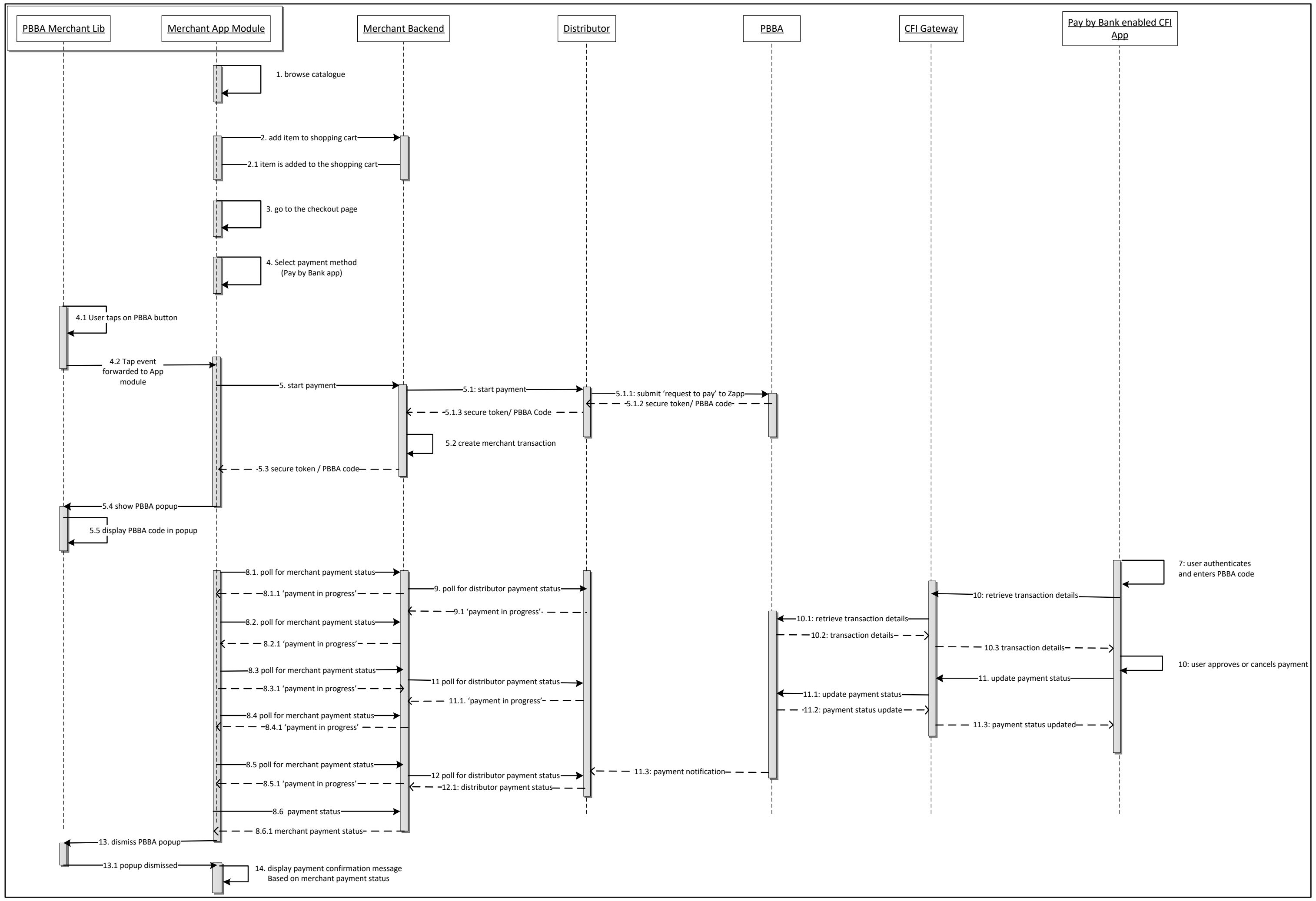

PBBA Merchant Lib
Merchant App Module
Merchant Backend
Distributor
PBBA
CFI Gateway
Pay by Bank enabled CFI App
1. browse catalogue
2. add item to shopping cart
2.1 item is added to the shopping cart
3. go to the checkout page
4. Select payment method (Pay by Bank app)
4.1 User taps on PBBA button
4.2 Tap event forwarded to App module
5. start payment
5.1: start payment
5.1.1: submit 'request to pay' to Zapp
5.1.2 secure token/ PBBA code
5.1.3 secure token/ PBBA Code
5.2 create merchant transaction
5.3 secure token / PBBA code
5.4 show PBBA popup
5.5 display PBBA code in popup
7: user authenticates and enters PBBA code
8.1. poll for merchant payment status
8.1.1 'payment in progress'
9. poll for distributor payment status
9.1 'payment in progress'
10: retrieve transaction details
10.1: retrieve transaction details
10.2: transaction details
10.3 transaction details
8.2. poll for merchant payment status
8.2.1 'payment in progress'
10: user approves or cancels payment
8.3 poll for merchant payment status
11 poll for distributor payment status
11. update payment status
8.3.1 'payment in progress'
11.1: update payment status
11.1. 'payment in progress'
11.2: payment status update
8.4 poll for merchant payment status
8.4.1 'payment in progress'
11.3: payment status updated
8.5 poll for merchant payment status
11.3: payment notification
12 poll for distributor payment status
8.5.1 'payment in progress'
12.1: distributor payment status
8.6 payment status
8.6.1 merchant payment status
13. dismiss PBBA popup
13.1 popup dismissed
14. display payment confirmation message Based on merchant payment status

Figure 3: Interaction between the components of the E-COMM PBBA code journey

Note The polling mechanism depicted is as an example implementation only. If polling is used, appropriate decoupling should be implemented between the website and backend, to support completion of a payment in case of polling failure in the website/application. Since PBBA uses a push based mechanism, it is recommended that push based mechanism is used between the Distributor and the Merchant. The Merchant should contact their Distributor for any Distributor specific implementation updates, API definitions or amendments.

3 Technical overview

3.1 Certified devices and OS versions

The library supports iOS 8 and up and is certified with the following devices:

3.1.1 Certified devices and OS versions

	Operating System/ Browser	OS Version	Comments
Web			
	Windows/Chrome	10	Windows resolutions 1024 X 768, 1280 X 800, 1280 X 1024, 1366 X 768 1440 x 900,1680 X 1050,1600 X 1200,1920 X 1200 1920 X 1080,2048 X 1536
	Windows/Edge	10	
	Windows/IE	10	
	Windows/Firefox	10	
	Windows/Chrome	7	
	Mac OS/Safari	Mojave	Mac - Resolutions 1024 X 768, 1280 x 960, 1280 X 1024 1600 x 1200, 1920 X 1080
	Mac OS/Chrome	Mojave	
Mobile (iOS)			
	iPhone 5S	10.3.3	
	iPhone 6	11.4	
	iPhone 6S Plus	12.1.2	
	iPhone 7	10.2.0	
	iPhone 7 plus	11.4.0	
	iPhone X	12.1.4	
	iPhone XR	12.0.1	
	iPhone XS Max	12.1.2	
Mobile (Android)			
	Samsung Galaxy S8	8.0.0	
	Samsung Galaxy S7 edge	6.0.1	
	Google Pixel	9	
	Samsung Galaxy S9	8.0.0	
iPAD and Tablet			
	Samsung Tab2	4.1.2	
	Galaxy Tab S4	5.1.1	
	iPad Pro 12.0	12.1.1	

	Operating System/ Browser	OS Version	Comments
	iPad Pro 10.5	12.1.1	
	iPad Mini 2	12.3.0	

Table 1: Certified devices and OS versions

3.1.2 Supported languages

The Merchant Button library is written in Objective-C and was validated with applications written in the following languages:

	Objective-C
Supported Languages	Swift 2.3
	Swift 3.0
	Swift 4.2

Table 2: Supported Languages

3.2 Source code

To get the source code for the Pay by Bank app Merchant Library, clone the repository (or download it as ZIP package) from GitHub. Merchant Library is available on GitHub: https://github.com/vocalinkzapp/pbba-merchant-button-library-ios

3.3 Integrating the Pay by Bank app Branded iOS Merchant Button Library into a Merchant application

The Pay by Bank app Branded iOS Merchant Button Library is for iOS Merchant applications to integrate Pay by Bank app payments.

	CocoaPods integration	**Manual integration using a static library/framework**	**Manual integration as subproject**
Pay by Bank app Merchant Button Library with Merchant App developed in Objective-C	YES	YES	YES
Pay by Bank app Merchant Button Library with Merchant App developed in Swift 2.3	YES	YES	YES
Pay by Bank app Merchant Button Library with Merchant App developed in Swift 3.0	YES	YES	YES

Table 3: Pay by Bank app Merchant Button Library integration types

3.3.1 CocoaPods integration

Add the following line to the Podfile if the CocoaPods dependency manager is being used.

Objective-C projects

```
pod 'ZappMerchantLib'
```

Swift projects

```
use_frameworks!

pod 'ZappMerchantLib'
```

3.3.2 Manual integration

3.3.2.1 Build the framework manually from the source and include the output binary into the user project

Objective-C projects

Follow these procedure steps to generate and integrate the Zapp Merchant Lib framework into the user project.

Procedure

1. Open the **ZappMerchantLib.xcworkspace** file.

   Note Ensure the workspace is opened – **not** the project file.
2. Select **ZappMerchantSDK** scheme from scheme selection drop-down.
3. Run the selected scheme.
4. The folder with build artefacts is exported to **~/Desktop folder**. The output folder now contains the following artefacts:

ZappMerchantLib.framework	Static framework
ZappMerchantLibResources.bundle	Resource bundle
clibZappMerchantLib.a	Static library (optional, to be used instead of ZappMerchantLib.framework)
Headers	Folder to be used together with libZappMerchantLib.a static lib (optional)
ZappMerchantLib-docset.zip	The documentation set.

Note If the framework documentation is to be exported along with the build artefacts then install the appledoc tool (`brew install appledoc`).

5. Add the generated framework **ZappMerchantLib.framework** to the **Link Binary With Libraries** section of the **Build Phases** project.
6. Add the **-ObjC linker** flag to the **Other Linker Flags** field in the **Build Settings** project.
7. Add **ZappMerchantLibResources.bundle** to the **Copy Bundle Resources** section of the Build Phases project.

Swift projects

The integration steps for Swift projects are the same as for Objective-C plus but with one additional step:

8. Add the **<ZappMerchantLib/ZappMerchantLib.h>** import statement to the **MerchantApp-Bridging-Header.h** file.

Note It is important to add the library import statement to the **Objective-C Bridging Header** as it is a static framework which doesn't define a Swift module.

3.3.2.2 Add the Pay by Bank app Branded iOS Merchant Button Library as subproject

Objective-C projects

Alternatively you can add the Pay by Bank app Branded iOS Merchant Button Library as a subproject to your app project:

Procedure

1. Download the **.zip** version of the library from Github.
2. **Unarchive** the project and copy it to the **project folder**.
3. Open the project in Xcode then go to the **File** menu and select the **Add File to "..."** option. Browse for the **ZappMerchantLib.xcodeproj** file.
4. Go to the **Link Binary With Libraries** section of the project **Build Phases** and press the plus (**+**) button. From the list add the **libZappMerchantLib.a** static lib to the linked libraries.
5. Add the **-ObjC linker** flag to the **Other Linker Flags** field in the **Build Settings** project.

6. Add **PATH_TO_MERCHANT_LIB_ROOT_DIRECTORY** to the **Header Search Paths** field in the **Build Settings** project.
7. Go to the **Copy Bundle Resources** section of the **Build Phases** project and press the plus (**+**) button. From the list add the **ZappMerchantLibResources.bundle** to your resources. If there are no **ZappMerchantLibResources.bundle** in the list, drag on drop it from the **Products** folder in the **ZappMerchantLib subproject**.

Swift projects

The integration steps for Swift projects are the same as for Objective-C plus one additional step:

Procedure

1. Add the **<ZappMerchantLib/ZappMerchantLib.h>** import statement to the **MerchantApp-Bridging-Header.h** file.

   Note It is important to add the **library import** statement to the **Objective-C Bridging Header** as it is a static library which does not define a Swift module.

3.3.3 Branded Pay by Bank app iOS Merchant Button Library structure

The figure below shows the folder structure of the iOS Merchant Button Library.

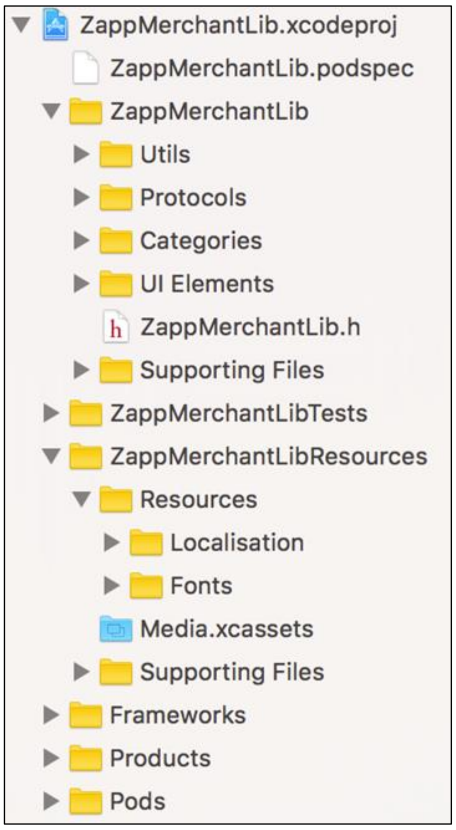


Figure 4: Branded Pay by Bank app iOS Merchant Button Library structure

The folders comprise:

ZappMerchantLib.podspec	The CocoaPods spec for the library.
ZappMerchantLib	Objective-C source files of the library.
ZappMerchantLibTests	The unit tests of the library.
ZappMerchantLibResources	The Library assets. These comprise: ● Fonts ● Strings files ● Images
Frameworks	The system frameworks to which the library should be linked.
Products	The project products.
Pods	The custom pods used for unit testing (e.g. Kiwi).

3.4 Update the Pay by Bank Branded iOS Merchant Button Library in a Merchant application

Update of the Zapp Merchant library includes removing old version of the library as a dependency and adding the new version of the library as a dependency.

3.4.1 Update the library using CocoaPods

Open the Podfile and update the version of the library defined there:

```
pod 'ZappMerchantLib', 'x.x.x', :git => 'https://github.com/vocalinkzapp/pbba-
merchant-button-library-ios.git'
```

In the sample above x.x.x represents the desired library version.

If the version is not indicated then simply run `'pod update'` command.

3.4.2 Removing an old version that was integrated as a precompiled binary

1. Open the project which integrates the Pay by Bank iOS Merchant Button Library;
2. Find and remove **ZappMerchantLib.framework** and **ZappMerchantLibResources.bundle** files from the project.

3.4.3 Removing an old version that was integrated as subproject

3. Open the project which integrates the Pay by Bank iOS Merchant Button Library;
4. Find and remove the **ZappMerchantLib** subproject from the main project.
5. Go to project builds settings and find the Header Search Paths field. Remove the **PATH_TO_MERCHANT_LIB_ROOT_DIRECTORY** from that field.

3.4.4 Adding the new version as a dependency

Follow the steps from section 3.3 Integrate the Pay by Bank app Branded iOS Merchant Button Library into a Merchant application to add the new version as a dependency.

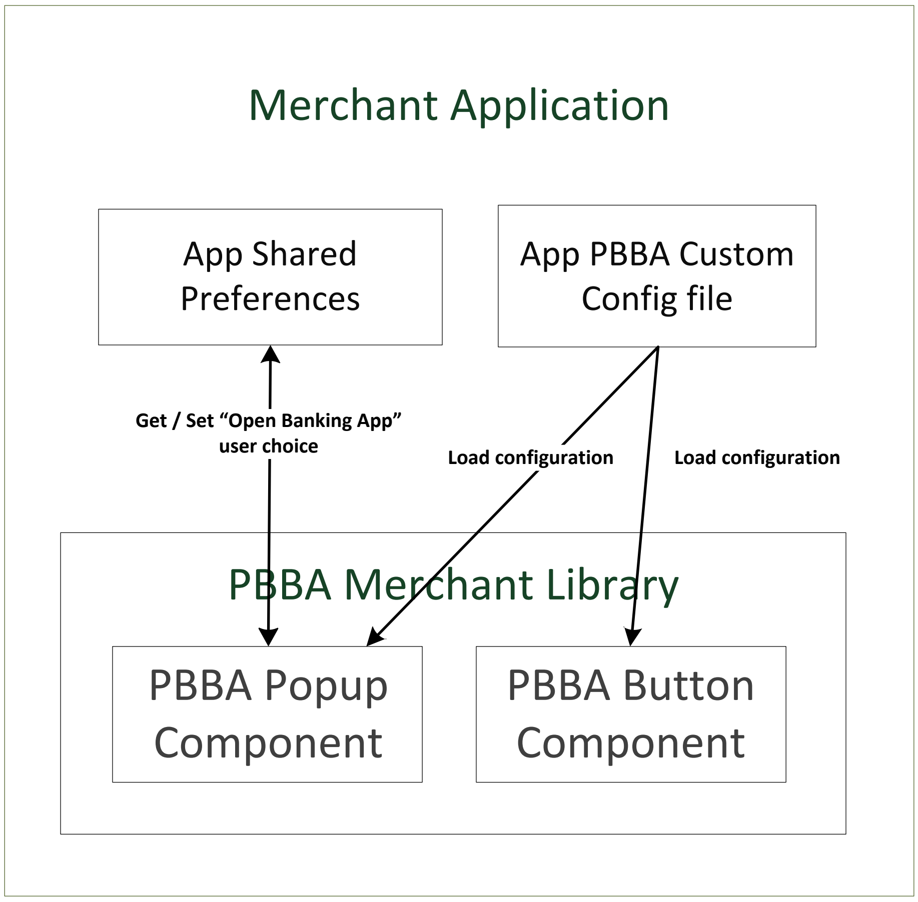
3.5 Pay by Bank app Branded iOS Merchant Button

The Pay by Bank app Branded iOS Button is the default theme provided by the Operator. The Library comes with a button and a pop-up. The colours, fonts and styles conform to Pay by Bank app standards (refer to the Brand Guidelines document for more information) and the Button is integrated with the Pay by Bank app pop-up and cookie management component.

There are two components associated with the Pay by Bank app Branded Button:

1. Pay by Bank app Button component
2. Pay by Bank app pop-up component

The following diagram describes the Merchant Application structure, the Pay by Bank app Merchant Library components and their interactions.



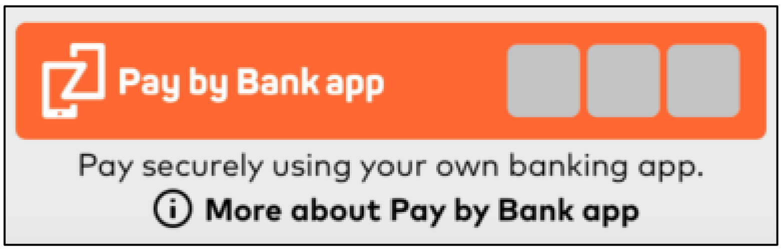
`App Shared Preferences' shown in the diagram above, is the `NSUserDefaults' storage of the Merchant App where the Merchant Button Library saves the flag to remember that the Consumer has tapped the `Open banking app' Button on the Pay by Bank app pop-up. This flag is saved under the key `com.nkapp.remembered'.

3.5.1 Pay by Bank app Button component

This component is packaged with two buttons, Pay by Bank app payment button and More about Pay by Bank app link.

The payment button covers the button press action, selected, highlighted and disabled button states; button animation during payment activity.

More about Pay by Bank app link guides through the Pay by Bank app payment journey.


Pay by Bank app
Pay securely using your own banking app.
More about Pay by Bank app

Note: As set out in Section 21 of the *Product and Service Definition* document, the Operator is contemplating the introduction of functionality to display the logos of CFIs which make available Pay by Bank app through their banking apps (in the spaces indicated by the grey boxes in the above diagram). However, this is a roadmap item of functionality which is not currently available and will only be implemented by the Operator if considered desirable following consultation with Participants on how best to deploy such feature. As such, the grey boxes and logos will not appear in the current version of the Merchant Button. Furthermore, the words “Works with these banking apps” will not appear in the current version.

3.5.2 Pay by Bank app pop-up component

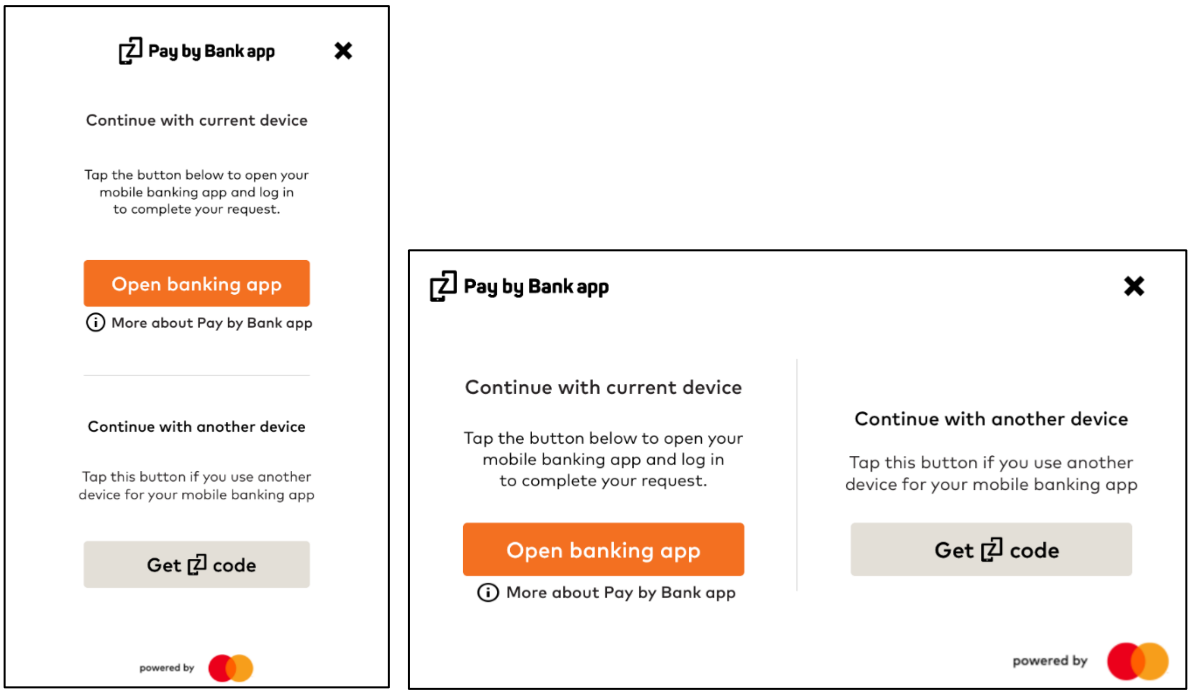
This component represents all the PBBA pop-up s that are shown to Consumers as part of the PBBA payment. The following section outlines the various pop-ups.

The pop-up examples below use the general `your mobile banking app` reference in the text.

3.5.2.1 M-COMM pop-ups

This pop-up is displayed the very first time the PBBA Button is tapped and there is at least one CFI App present on the device. Once the Consumer has pressed the ‘Open banking app’ button, this preference is remembered by the PBBA Branded iOS Merchant Button Library Brand the PBBA enabled CFI App is opened automatically. This preference is cleared when this automatic opening cannot happen because the Consumer has uninstalled all the PBBA enabled CFI Apps. It also contains more about Pay by Bank app link.

On the click of “Get Code” button the E-COMM pop-up with a Pay by Bank app code is opened specifying the step by step instructions to help the consumer to complete their purchase on another device.



Continue with current device

Tap the button below to open your mobile banking app and log in to complete your request.

Continue with another device

Tap this button if you use another device for your mobile banking app

Continue with current device

Tap the button below to open your mobile banking app and log in to complete your request.

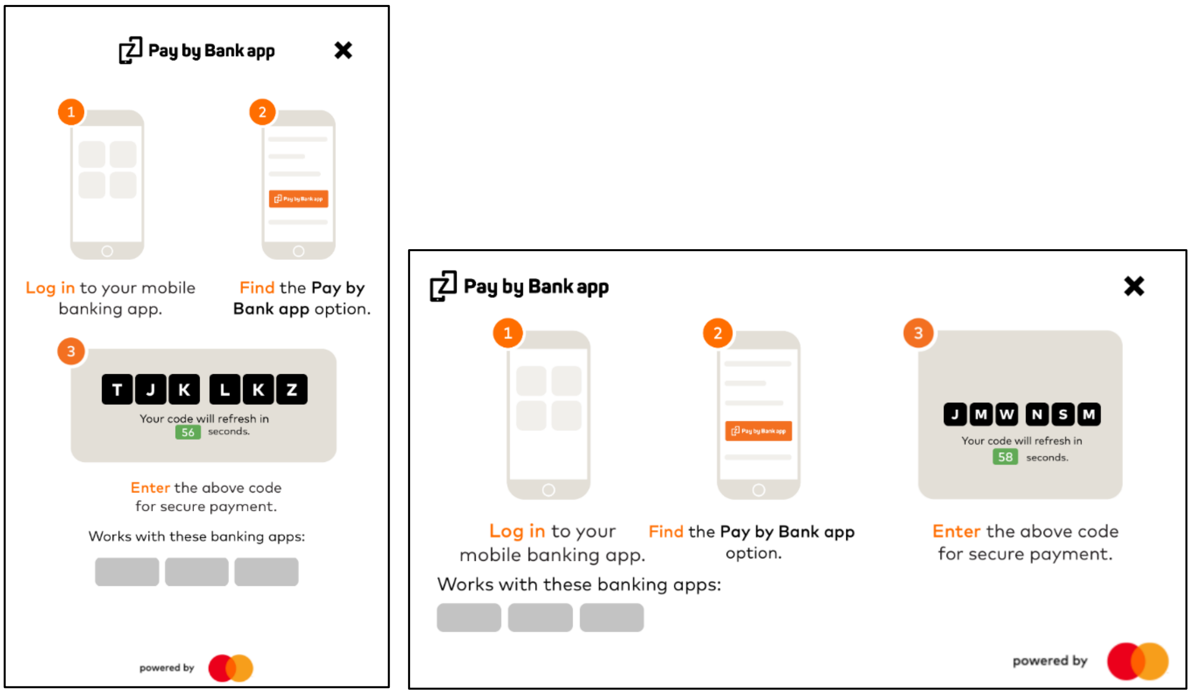
Continue with another device

Tap this button if you use another device for your mobile banking app

M-COMM pop-ups

3.5.2.2 E-COMM pop-ups

If there are no Pay by Bank app supported CFI Apps installed on the device, the following pop-up is displayed directly on click of Pay by Bank app branded merchant button. This pop-up includes a code and step by step instructions to help the consumer to complete their purchase on another device.



Log in to your mobile banking app.

Find the Pay by Bank app option.

Your code will refresh in 56 seconds.

Enter the above code for secure payment.

Works with these banking apps:

Log in to your mobile banking app.

Find the Pay by Bank app option.

Your code will refresh in 58 seconds.

Enter the above code for secure payment.

Works with these banking apps:

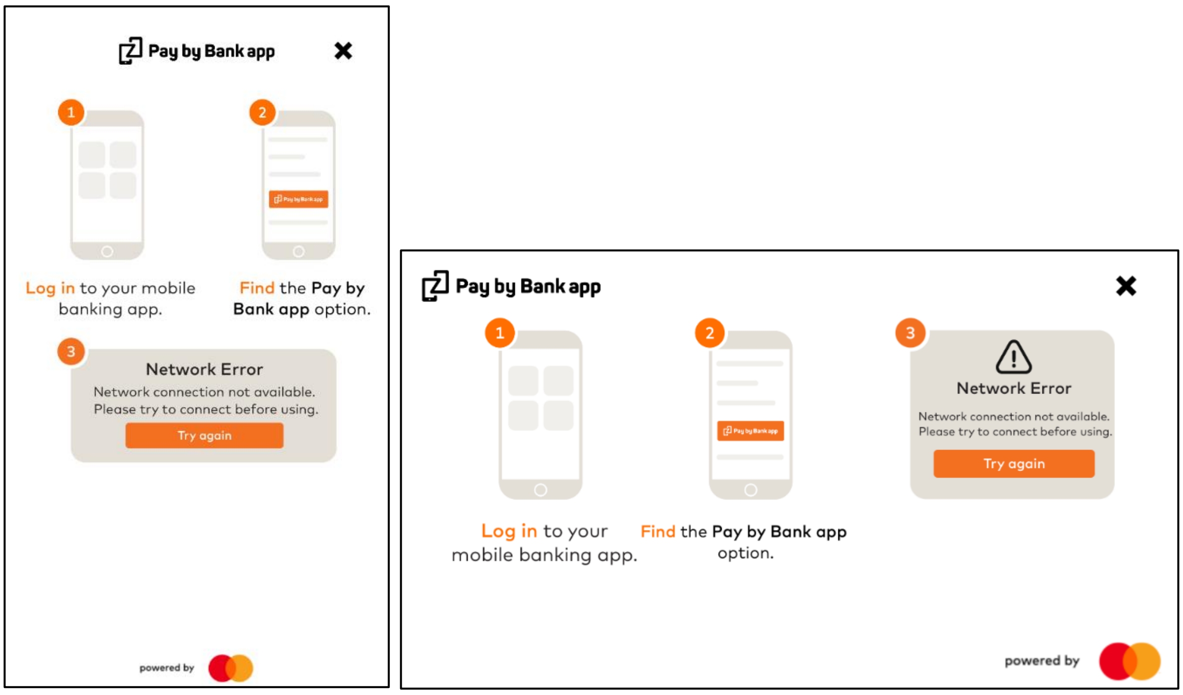
E-COMM pop-ups

Note: As outlined above, the words “Works with these banking apps” and the grey boxes beneath (in the above diagrams) will not appear in the current version of the Merchant Button.

3.5.2.3 Error pop-ups

If an error occurs during the payment process, the consumer is shown with the following error pop-ups based on the error type.

3.5.2.4 Network error pop-ups

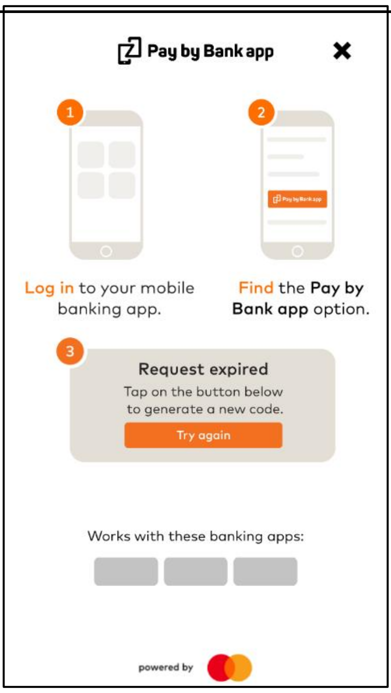

Pay by Bank app
1
2
Log in to your mobile banking app.
Find the Pay by Bank app option.
3
Try again
powered by
Pay by Bank app
1
2
3
Log in to your mobile banking app.
Find the Pay by Bank app option.
Try again
powered by

Network Error
Network connection not available. Please try to connect before using.

Network Error
Network connection not available. Please try to connect before using.

Network error pop-ups

3.5.2.5 Request expired error pop-ups


Pay by Bank app

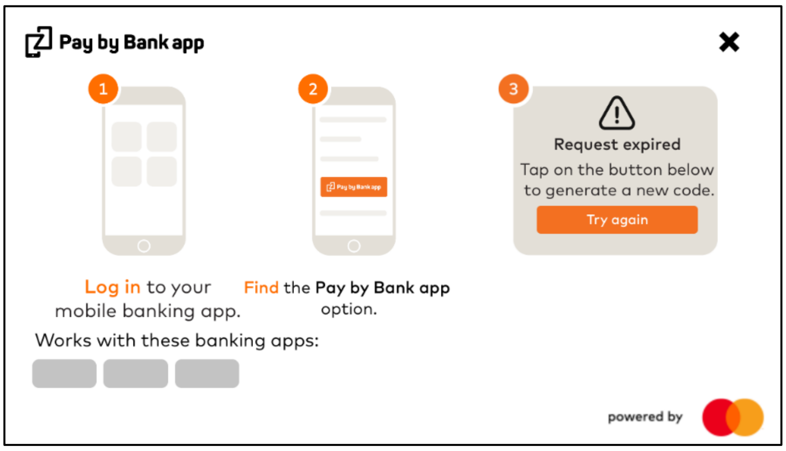
1 Log in to your mobile banking app.

2 Find the Pay by Bank app option.

3 Request expired
Tap on the button below to generate a new code.
Try again

Works with these banking apps:

powered by


Pay by Bank app

1 Log in to your mobile banking app.

2 Find the Pay by Bank app option.

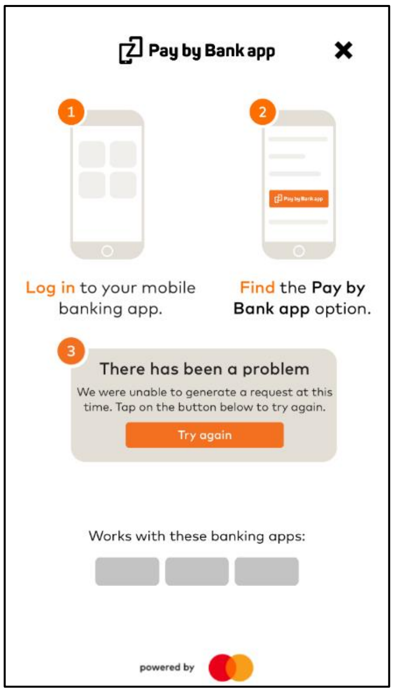
3 Request expired
Tap on the button below to generate a new code.
Try again

Works with these banking apps:

powered by

Request expired error Pop-ups

3.5.2.6 Pay by Bank app code generation error pop-ups


Pay by Bank app

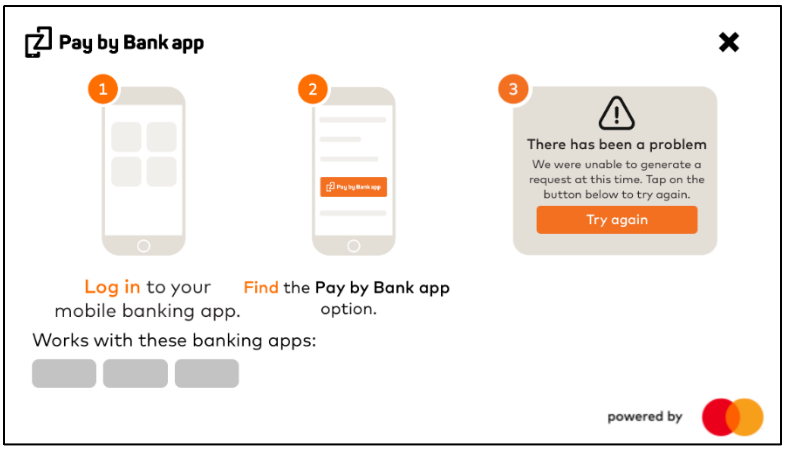
1 Log in to your mobile banking app.

2 Find the Pay by Bank app option.

3 There has been a problem
We were unable to generate a request at this time. Tap on the button below to try again.
Try again

Works with these banking apps:

powered by


Pay by Bank app

1 Log in to your mobile banking app.

2 Find the Pay by Bank app option.

3 There has been a problem
We were unable to generate a request at this time. Tap on the button below to try again.
Try again

Works with these banking apps:

powered by

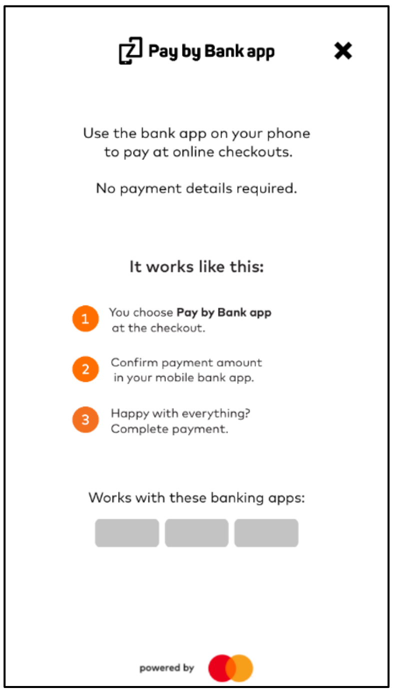
Pay by Bank app code generation error pop-ups

Note: As outlined above, the words "Works with these banking apps" and the grey boxes beneath (in the above diagrams) will not appear in the current version of the Merchant Button.

3.5.2.7 More about Pay by Bank app pop-ups

This popup is displayed to the consumer on click of More about Pay by Bank app link to provide more details about the pay by bank app payment journey. More about Pay by Bank app link is present on PBBA button component and on M-COMM pop-up.

Note: As outlined above, the words "Works with these banking apps" and the grey boxes beneath (in the following diagrams) will not appear in the current version of the Merchant Button.



Pay by Bank app

Use the bank app on your phone to pay at online checkouts.

No payment details required.

It works like this:

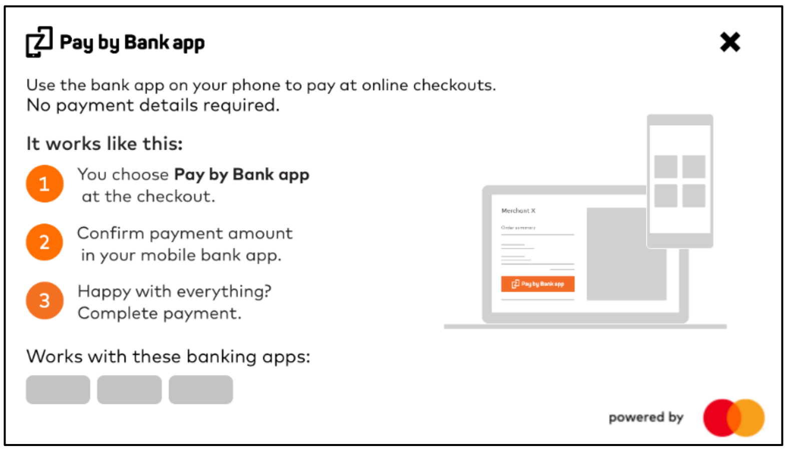
1 You choose **Pay by Bank app** at the checkout.

2 Confirm payment amount in your mobile bank app.

3 Happy with everything? Complete payment.

Works with these banking apps:

powered by



Pay by Bank app

Use the bank app on your phone to pay at online checkouts.
No payment details required.

It works like this:

1 You choose **Pay by Bank app** at the checkout.

2 Confirm payment amount in your mobile bank app.

3 Happy with everything? Complete payment.

Works with these banking apps:

powered by

More about Pay by Bank app pop-ups

4 Usage

4.1 Introduction

This chapter describes the recommended way to use the PBBA Branded iOS Merchant Button Library.

4.2 Set up Pay by Bank App Button

Add a new View to your storyboard / xib layout and change its class to PBBAButton. The following code snippet shows an example of PBBA Button which is connected as an outlet from storyboard / xib to a view controller.

```
#import <ZappMerchantLib/PBBAButton.h>

@interface ViewController ()

@property (nonatomic, weak) IBOutlet PBBAButton *pbbaButton;

@end

@implementation ViewController

@end
```

The minimum Pay by Bank app Button size should be 320 x 89 points. The Merchant App may display the Pay by Bank app Button in a different size.

Important Merchant developer should be aware that if values are set to be too small, the Pay by Bank app Button may not appear correctly. The sizes of the Pay by Bank app brand images are fixed and do not scale up or down if the button size is increased or decreased.

Note The text within the Pay by Bank app Branded Button (logo and `Pay by Bank app' text) will not be rendered in the Xcode Interface Builder because it is not IBDesignable enabled. Due to a Xcode IDE limitation where the IBDesignable views are rendered only from the project sources or dynamic frameworks projects included as subprojects, there is no possibility to support the IBDesignable views for the other types of integrations like static libraries, dynamic frameworks included as binaries or CocoaPods integrations.

4.3 Integration Steps of an M-Comm journey

The steps to integrate the Pay by Bank app Branded iOS Merchant Button of the M-COMM journey in the Merchant App are as follows:

Procedure

1. Integrate the Pay by Bank app Branded iOS Button.
2. Submit payment request to Merchant backend.
3. Integrate the Pay by Bank app pop-up (which can invoke the Pay by Bank app CFI App directly).

4. Get payment status from Merchant backend.
5. Dismiss the Pay by Bank app pop-up.
6. Display Merchant payment confirmation screen.

4.3.1 Integrate the Pay by Bank app button

As a next step, the Merchant App should display the Pay by Bank app Button. The .onClick event handler of the button should be implemented by the Merchant.

```
#import <ZappMerchantLib/PBBAButton.h>

@interface ViewController () <PBBAButtonDelegate>

@property (nonatomic, weak) IBOutlet PBBAButton *pbbaButton;

@end

@implementation ViewController

- (void)viewDidLoad
{
    [super viewDidLoad];

    self.pbbaButton.delegate = self;
}

#pragma mark - PBBAButtonDelegate

- (BOOL)pbbaButtonDidPress:(PBBAButton *)pbbaButton
{
    // Start the submit payment request

    // If YES returned then button will disable itself and will start default PBBA
animation
    // If NO returned then button will not react, remaining enabled.
    return YES;
}

@end
```

4.3.2 Submit payment request to Merchant backend

The .onClick event handler of the Pay by Bank app Button is called when the Consumer taps to the Pay by Bank app Button. The Merchant has to submit a payment request to the Merchant backend. The format/protocol to use is left open to the Merchant.

4.3.3 Integrate the Pay by Bank app pop-up

4.3.3.1 Integrate pop-up for Pay by Bank app M-COMM journey

The Pay by Bank app Branded iOS Merchant Button Library provides a feature to display the Pay by Bank app branded pop-ups for the payment Transaction:

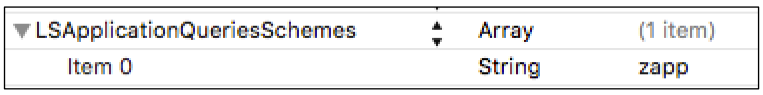
```
    #import <ZappMerchantLib/PBBAAppUtils.h>


    // Display PBBA popup
[PBBAAppUtils showPBBAPopup:popupPresenter secureToken:secureToken brn:brn
expiryInterval:expiryInterval delegate:popupDelegate];
```

Parameter name	Parameter description	Parameter source
popupPresenter	The instance of the view controller which will present the PBBA Pop-up.	Provided by the Merchant App.
secureToken	The unique token that identifies the payment request.	< Consult Distributor Documentation >
brn	The six character code that identifies the payment request for the duration of retrieval timeout period.	< Consult Distributor Documentation >
expiryInterval	The time interval	< Consult Distributor Documentation >
popupDelegate	The PBBA pop-up delegate instance.	Provided by the Merchant App.

Table 4: Parameters for `show Pay by Bank app pop-up' method call

If the Consumer has tapped the 'Open banking app' Button before and the device has a Pay by Bank app enabled CFI App installed, this API call invokes to the CFI App immediately (without displaying the pop-up). If there is no Pay by Bank app enabled CFI App installed on the Consumer's device, the Pay by Bank app pop-up displays the Pay by Bank app Code automatically.

Important In order for the library to be able to check if a Pay by Bank app enabled CFI App is installed, it is required to add **LSApplicationQueriesSchemes** key entry to the application **Info.plist** file with the string value: **zapp**. It specifies the common Pay by Bank app URL scheme, used by the Pay by Bank app enabled CFI Apps.



▼ LSApplicationQueriesSchemes	Array	(1 item)
Item 0	String	zapp

How to implement the pop-up callback

1. A callback will be received when the Pay by Bank app pop-up is dismissed.
2. A sample code of how this callback should be implemented is as follows:

```
#pragma mark - PBBAPopupViewControllerDelegate

- (void)pbbaPopupViewControllerRetryPaymentRequest:(PBBAPopupViewController
*)pbbaPopupViewController
{
    // Not applicable for successful responses (only error popup)
}

- (void)pbbaPopupViewControllerDidCloseByUser:(PBBAPopupViewController
*)pbbaPopupViewController
{
     // Will be called when the Consumer taps on the top-right corner of the
popup and dismissed it.
}
```

4.3.3.2 Integrate PBBA pop-up for error handling

The Pay by Bank app Merchant Button Library provides a feature to display the Pay by Bank app branded error pop-up for the payment Transaction:

```
#import <ZappMerchantLib/PBBAAppUtils.h>

// Display PBBA error popup
[PBBAAppUtils showPBBAErrorPopup:popupPresenter errorCode:errorCode
errorTitle:errorTitle errorMessage:errorMessage delegate:popupDelegate];
```

Parameter name	Parameter description	Parameter source
popupPresenter	The instance of view controller which will present the Pay by Bank app A pop-up.	Provided by the Merchant App.
errorCode	The error code to be displayed along with error message in the Pay by Bank app pop-up.	Provided by the Merchant App.
errorTitle	The error title to be displayed along with error message in the Pay by Bank app pop-up.	Provided by the Merchant App.
errorMessage	The error message to be displayed in the Pay by Bank app pop-up.	Provided by the Merchant App.
popupDelegate	The Pay by Bank app pop-up delegate instance.	Provided by the Merchant App.

Table 5: Parameters for `show Pay by Bank app error pop-up' method call

The length of the strings displayed in the Pay by Bank app error dialog is not limited but the recommended lengths of these strings are:

- Maximum 25 characters for the error title
- Maximum 75 characters for the error message
- Maximum 5 characters for the error code

How to implement the pop-up callback

1. A callback will be received when the Pay by Bank app pop-up is dismissed or when the PBBA Button inside the error pop-up is tapped.
2. A sample code of how this callback should be implemented is as follows:

```
#pragma mark - PBBAPopupViewControllerDelegate

- (void)pbbaPopupViewControllerRetryPaymentRequest:(PBBAPopupViewController
*)pbbaPopupViewController
{
    // Will be called only when the Consumer taps on the “Pay by Bank app”
button on the PBBA error popup
    // The Merchant can retry submitting the payment request
}

- (void)pbbaPopupViewControllerDidCloseByUser:(PBBAPopupViewController
*)pbbaPopupViewController
{
    // Will be called when the Consumer taps on the top-right corner of the
popup and dismissed it.
}
```

4.3.4 Get payment status from Merchant backend

The Merchant should implement the logic for getting the status of the payment. This status change detection can be implemented in various ways and is up to the Merchant. One way to implement it is to poll the Merchant backend for status change when the Merchant App has displayed the Pay by Bank app (PBBA) pop-up and the Merchant App is active (running in the foreground). There is no need to check the payment status while the Merchant App is in the background (for example, because the focus is forwarded to the CFI App). However, the status change detection can start as soon as the PBBA pop-up is displayed because if the Consumer does not have a PBBA enabled CFI App installed, the PBBA pop-up displays the PBBA code and the payment authorisation can happen in a separate device.

4.3.5 Display payment confirmation screen

The Merchant should display their payment confirmation screen once the payment status of the Transaction is known.

4.4 Additional consideration for the integration of an E-COMM (two device) journey

There are no additional changes required for an E-COMM journey.

Note The Pay by Bank app Merchant Library framework automatically recognises that there is no Pay by Bank app enabled CFI App installed on the device and displays the E-COMM version of the Pay by Bank app pop-up.

4.5 Additional API set

4.5.1 API to check if the device has Pay by Bank app enabled CFI App installed

Using this API, the Merchant App can check if the Consumer's device has at least one PBBA enabled CFI App installed. The Operator recommends not to cache the response but call this API every time they want to check before any Pay by Bank app pop-up invocation.

```
#import <ZappMerchantLib/PBBAAppUtils.h>

// Check if Consumer's device supports PBBA payments
if ([PBBAAppUtils isCFIAppAvailable]) {
    // The device has PBBA enabled CFI App installed
} else {
    // The device does not have PBBA enabled CFI App installed
}
```

Note This is an optional utility API which might be used for testing purpose.

4.5.2 API to invoke the Pay by Bank app enabled CFI App

The Merchant Library provides a feature to invoke the Pay by Bank app enabled CFI App outside the Pay by Bank app pop-up. The Operator recommends not using this function unless it is completely necessary:

```
#import <ZappMerchantLib/PBBAAppUtils.h>

// Invoke the PBBA CFI App
[PBBAAppUtils openBankingApp:secureToken];
```

This invocation happens automatically if the Merchant App calls the Pay by Bank app pop-up invocation.

Parameter name	Parameter description	Parameter source
secureToken	The unique token that identifies the payment request.	< Consult Distributor Documentation >

Table 6: Parameters for `open banking app' method call

Note This is an optional utility API which might be used for testing purpose.

5 Sample code

This section describes a frame of a simplified sample implementation of the PBBA Branded iOS Merchant Button Library for the M-COMM journey. The code displayed in black relates to the PBBA Branded iOS Button Library. The code displayed in blue is Merchant App related.

Note This is not compilable code as it assumes some of the Merchant specific codebase.

```
#import <ZappMerchantLib/ZappMerchantLib.h>

#import "MerchantPaymentViewController.h"

@interface MerchantPaymentViewController () <PBBAButtonDelegate, PBBAPopupViewControllerDelegate>

@property (nonatomic, weak) IBOutlet PBBAButton *pbbaButton;

@property (nonatomic, strong) MerchantNetworkService networkService;
@property (nonatomic, strong) MerchantPaymentDetails paymentDetails;

@end

@implementation MerchantPaymentViewController

- (void)viewDidLoad
{
    [super viewDidLoad];

    self.pbbaButton.delegate = self;
}

- (void)submitPayment
{
    // The Merchant App uses the network service to make an async HTTP request to the Merchant gateway.
    // Merchant network service receives the response e.g. in JSON format, parses it to an object which is called e.g.
    // Transaction and returns this object in the provided callback. An error object is returned if payment request fails.
    [self.networkService submitPaymentRequest:self.paymentDetails completion:^(Transaction *transaction, NSError *error) {

        if (error) {
            [self didReceiveError:error];
        } else {
            [self didReceiveTransaction:transaction];
        }
    }];
}

- (void)getPaymentStatus
{
    // Here the Merchant App e.g. can wait for 5 seconds not to put a heavy load on its backend
    // then make a request to the Merchant gateway, load its response e.g. in JSON format, parse it to
    // an enum type e.g. PaymentStatus
    [self.networkService getPaymentStatus:^(PaymentStatus status, NSError *error) {

        if (error) {
            [self didReceiveError:error];
        } else {
            [self didReceivePaymentStatus:status];
        }
    }];
}

#pragma mark - Request Callbacks

- (void)didReceiveTransaction:(Transaction *transaction)
{
    // In case of standard M-Comm:
    //   If it is the very first time payment then the PBBA popup will appear.
    //   If this is not the first payment then this will invoke PBBA enabled CFI App automatically without a PBBA Popup
displayed.
    // In case of standard E-Comm: this will display the PBBA Popup with the PBBA code.
    [PBBAAppUtils showPBBAPopup:self
                    secureToken:transaction.secureToken
                            brn:transaction.brn
                       delegate:self];


}

- (void)didReceiveError:(NSError *error)
{
    [PBBAAppUtils showPBBAErrorPopup:self
                           errorCode:nil
                          errorTitle:NSLocalizedString(@"Error", nil)
                        errorMessage:error.localizedDescription
                            delegate:self];
}
```

```
- (void)didReceivePaymentStatus:(PaymentStatus status)
{
    if (status == PaymentStatusInProgress) {
        [self getPaymentStatus];
    } else
        // For M-Comm payment finished, display Merchant payment status page
        // For E-Comm payment finished, dismiss PBBA Popup
    }
}

#pragma mark - PBBAButtonDelegate

- (BOOL)pbbaButtonDidPress:(PBBAButton *)paymentButton
{
    [self submitPayment];

    return YES; // PBBA button will start animating automatically
}

#pragma mark - PBBAPopupViewControllerDelegate

- (void)pbbaPopupViewControllerRetryPaymentRequest:(PBBAPopupViewController *)pbbaPopupViewController
{
    // This method is called only when the Consumer clicks on the ‘Pay by Bank app’ button
    // on the PBBA error popup
    [self submitPayment];
}

- (void)pbbaPopupViewControllerDidCloseByUser:(PBBAPopupViewController *)pbbaPopupViewController
{
    // This method is called on any PBBA popup when the Consumer taps the dismiss button
    // on the top-right corner of the PBBA popup
    self.pbbaButton.enabled = YES;
}

@end
```

A Appendices

A.1 Hybrid Merchant Apps

In the event, the Merchant offers an app that uses Web Views to serve the checkout page (i.e. a Hybrid app) the Merchant may choose to implement the Web Merchant Button instead of the native iOS Merchant Button. Pay by Bank app does not mandate that the native library must be used for Hybrid apps.