

Unlock: York

Final Testing and Integration Plan

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Author

Jack Mckeown



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1 Introduction

1.1 Purpose

This Testing and Integration Plan for *Unlock's* pilot product *Unlock:York* is created to outline the overall testing methodology and necessary tests to be carried out to ensure the quality and functionality of the final product. This document only gives outline tests for modules and classes, the actual tests will be written and carried out by team members during development.

1.2 Terminology

Point of Interest (POI)	A significant tourist attraction within a city
Sub-Point of Interest (sPOI)	An interesting feature or location within the Point of Interest
Project-Wide Specification XML (PWS XML)	A common XML-based file-format between multiple organisations which allows loading of multimedia into the application

1.3 Unlock:York

Unlock: York is an application allowing users to interact with and explore the city of York in a new, rewarding way. Users can discover new locations, find out about local attractions upon discovery, and receive awards for visiting the attractions. At major attractions, there is the opportunity for kiosks running the *Unlock:York* application to be installed, to give further, more detailed information on the specific point of interest. Hence, there are two applications to be tested:

- An Android mobile app for users – built using Java in the IntelliJ IDEA IDE, using Android SDK tools.
- A desktop-based application to run on the kiosks – also built in the IntelliJ IDEA IDE.

There will be overlap for some areas of testing for the two applications, however the functionality is not exactly the same, so there will be some tests only applicable to one or the other. Therefore a testing and integration plan for each application is to be produced.



1.4 Development Methodology

As set out in the Quality Assurance Manual, the approach *Unlock* takes to software development is the Agile Software Development Methodology.

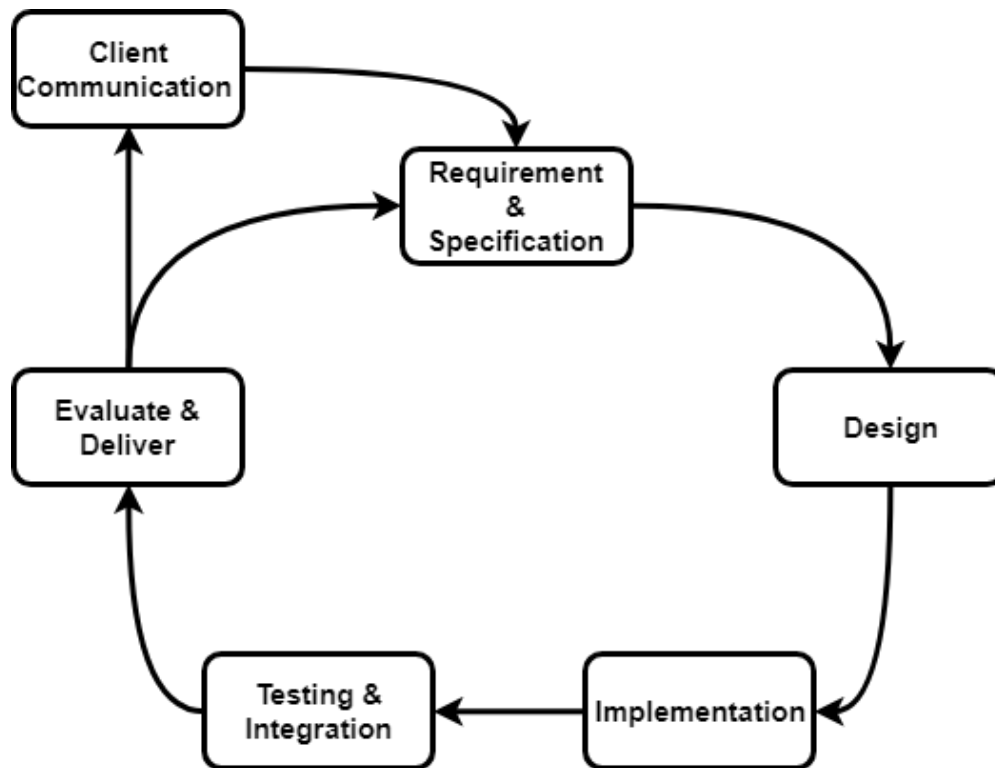


Figure 1 – *Unlock*’s Agile Development Methodology

Using this approach has certain ramifications for the Testing and Integration stage of the lifecycle. Using an Agile approach implies that the implementation will be carried out on a Test Driven Development (TDD) basis. The process will be as follows:

- Programmers given user stories (as defined in the Functional Specification) to implement.
- Test cases based on user stories are generated, with the positive test outcomes being based on the acceptance criteria outlined in the Functional Specification.
- Code is then written to pass the test and thus fulfil the acceptance criteria for the user story.
- Code can then be refactored to ensure quality and efficiency of code.

1.5 Testing Process and Documentation

1.5.1 White Box and Black Box Testing

The tests carried out on applications and modules will take one of two forms; Black Box Tests or White Box Tests. These can be characterised as follows:

- White Box Test – Uses knowledge of internal structure of the program for testing, so is testing the inner workings of the software itself.
- Black Box Test – Focuses purely on the functionality of an application or module. The test does not concern the inner workings of the software, but is more concerned with getting the correct inputs and outputs. Black Box Testing is testing from the point of view of a user of the application.



1.5.2 Test Procedure and Documentation

The tests performed and test outcomes will be recorded on Test Report Forms (see QA Manual). The procedure for testing is as follows:

- Write unit tests or test procedures based on the test outlines in the Testing and Integration Plan.
- Carry out tests.
- Record outcome, and edit code if needed, recording what has been changed.
- Ensure the test is passed with correct result.
- Hand in Test Report to Testing and Integration Manager.

Once all tests have been completed and handed to the Testing and Integration Manager, the Manager will then collate and document all tests in a Final Testing and Integration Report.

1.6 The Testing Stages

The approach defined in the section above can be used during the implementation stage to get the individual units working to specification, however, for the product to function as a complete entity, further testing must be carried out. At *Unlock* we have 3 stages of rigorous testing which will ensure that the product will function as intended when individual units are integrated together, and when the whole application is put together preceding final release.

1.6.1 Unit Testing

This first stage of testing is the most basic level, testing individual classes and units to ensure that they meet the acceptance criteria for the user story being implemented. The process for this is outlined above in section 1.3. These tests will mostly take the form of White Box Tests, because the Unit Testing forms part of the TDD process, so the code will be written to pass the tests. A small amount of first stage tests may not be JUnit White Box tests, but visual Black Box tests. Situations where this is the better option is user stories that can only realistically be tested observationally and in terms of functionality.

1.6.2 Integrated Testing

After individual units and classes have been tested and are verified to be working as intended, they can then be integrated together to form iterations. Integration tests need to be written to ensure that all modules and classes interact with each other as intended and verify that the acceptance criteria are still met. The testing for this stage will be a mixture of White and Black Box Testing.

1.6.3 Overall System Testing

Once the integration testing stage is complete, and all modules have been successfully integrated, the System Testing stage can begin. This will take the form of Black Box testing, allowing the overall application to be tested from the point of view of a user. This stage will verify that the whole application works as intended.

1.6.4 Testing of Modules from Contracts

Unlock will be contracted with writing modules for other companies. We will apply the same process of defining user stories and acceptance criteria and then carry out development using the same process as for our code. These contracted modules will be fully tested to ensure we are delivering high-quality, fully-operational code to our clients.



1.7 Note on the Ongoing Agile Process and Testing

As an Agile approach to software development is used at *Unlock*, user stories are likely to be updated and change slightly at points throughout development, therefore the tests outlined on this document may also change. The Functional Specification will first be updated with any new/alterd user stories and then this document will be also be updated.

1.8 User Story Summaries

A summary main overall user stories, full details of sub-stories can be found in the Functional Specification.

Main User Story Number	Phone or Kiosk	Summary
S01	K	Administrators can upload data to a kiosk.
S02	PK	Map can be loaded with POIs and can be manipulated (zooming and panning).
S03	PK	Current location on map can be displayed.
S04	P	QR codes can be scanned to unlock content at a POI.
S05	P	Viewing unlock progress – show locked and unlocked POIs, rewards and leaderboards.
S06	P	App can be successfully downloaded, and content can be unlocked by GPS location.
S07	PK	POI information can be viewed in a scrollable content pane: <ul style="list-style-type: none">- Opening hours- Text description.- Videos (with manipulation on interaction)- Audio (with manipulation on interaction)- Photos (with zoom)
S08	PK	sPOI information can be viewed: <ul style="list-style-type: none">- Text description (with scrolling)- Videos (with manipulation on interaction)- Audio (with manipulation on interaction)- Photos (with zoom)
S09	-	Phone and Kiosk: Businesses can promote themselves if near to a POI. Phone only: User rewards are available for unlocking locations.
S10	P	Suggested routes at POIs can be viewed.
S11	P	Audio will continue to play if phone is locked.
S12	P	Hidden locations can be unlocked and a notification will be displayed when a hidden location is found.
S13	PK	Settings can be changed: <ul style="list-style-type: none">- Audio and notification settings- Autoplay of POI content (Phone)- Leaderboards and social media settings (Phone)



2 Shared Unit Tests

Some user stories are shared between both the mobile application and the kiosk; therefore the test procedures for these units will be the same.

Test ID	User Story ID	Test Procedure	Desired Outcomes
UT1.0	S02.0.0	Load map.	Local map loads onto the screen with POI icons.
UT1.1	S02.1.0	Trigger zoom in/out activity.	Correct zooming activity is triggered upon button presses.
UT1.2	S02.1.1	Scroll mouse wheel/screen zoom pinch.	Different amount of detail is displayed with zoom distance.
UT1.3	S02.1.2	Set zoom to value above maximum	Zoom does not exceed maximum level.
UT1.4	S02.1.3	Zoom at different levels.	Level of detail changes.
UT1.5	S02.1.4	Zoom to lowest level.	Street level map started.
UT1.6	S02.2.0	Trigger movement around map with taps/clicks.	Map moves and pans with movement.
UT1.7	S02.3.0	Visual test – click on map at any point	Console displays coordinates.
		Click on POI image	Console outputs “clicked on POI”
UT2.0	S03.0.0	(a) Input trial user GPS location (b) Input no user location	(a) User location is visible and correctly located. (b) “no GPS signal” error is displayed.
UT3.0	S07.0.0	(a) Trigger POI icon press at a kiosk location (b) Trigger POI icon press for a different location when at a kiosk. (c) Trigger POI icon press on mobile app.	(a) Zoom into location is triggered and further information set to be visible. (b) Zoom into location and display message telling user they must visit the location. (c) Zoom into location and display available content.
UT3.1	S07.1.0	Trigger a POI icon press	Opening hours can be displayed.
UT3.2	S07.2.0	Trigger a POI icon press.	Text description displayed.
UT3.3	S07.2.1	Scroll in a content pane.	More content becomes available.
UT3.4	S07.3.0	Trigger a POI icon press.	Video displayed in a content pane.
UT3.5	S07.3.1	Open video	Video can be paused/stopped, played and the volume can be changed.



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UT3.6	S07.4.0	Audio button pressed in content pane.	Audio plays.
UT3.7	S07.4.1	Play audio.	Audio can be played, paused and stopped and the volume can be changed.
UT3.8	S07.5.0	Trigger POI icon press.	Photos are displayed in content pane.
UT3.9	S07.5.1	Open a photo	Photo can be zoomed in on.
UT4.0	S08.0.0	Trigger a sub-Point of Interest (sPOI) icon press.	Text description displayed.
UT4.1	S08.0.1	Scroll in a content pane.	More content becomes available.
UT4.2	S08.1.0	Trigger an sPOI icon press.	Video displayed in a content pane.
UT4.3	S08.1.1	Open video.	Video can be paused/stopped, played and the volume can be changed.
UT4.4	S08.2.0	Audio button pressed in content pane.	Audio plays.
UT4.5	S08.2.1	Play audio.	Audio can be played, paused and stopped and the volume can be changed.
UT4.6	S08.3.0	Trigger sPOI icon press.	Photos are displayed in content pane.
UT4.7	S08.3.1	Open a photo	Photo can be zoomed in on.
UT6.0	S13.0.0	Click on settings icon.	App moves to settings screen.
UT6.1	S13.1.0	(a) Adjust audio settings. (b) Adjust notification settings	(a) Audio set to be on/off. (b) Notifications set to be on/off.



3 Mobile Application Tests

3.1 Unit Tests

Test ID	User Story ID	Test Procedure	Desired Outcomes
MUT1.0	S04.0.0	(a) Trigger QR scan of valid code. (b) Trigger QR scan of invalid code.	(a) App moves to content screen. (b) Error message "Invalid QR code" displayed.
MUT1.1	S04.1.0	(a) Trigger QR scan of valid code. (b) Trigger QR scan of invalid code.	(a) Success animation and sound plays. (b) Failure sound plays.
MUT2.0	S05.0.0	Give 2 test POIs (1 set to locked, 1 unlocked).	The status of the POI is correct.
MUT2.1	S05.1.0	Tap progress bar	The app moves to the progress information screen.
MUT2.2	S05.2.0	Activate leaderboard button.	App moves to the leaderboard display and test values can be displayed.
MUT3.0	S06.0.0	Open app.	App opens properly and on main menu.
MUT3.1	S06.1.0	Set GPS to POI.	Content is set to be unlocked.
MUT4.0	S09.0.0	Set an example sponsored business.	Business set to appear at correct location on map.
MUT4.1	S09.1.0	Generate a reward.	Reward is stored in user profile.
MUT5.0	S10.0.0	Input a route for a POI.	Route is generated.
MUT6.0	S11.0.0	Start content and set phone to be locked.	Audio still plays.
MUT7.0	S12.0.0	Simulate arrival at hidden location.	Hidden content is set to be unlocked and location set to appear on map.
MUT7.1	S12.1.0	Simulate arrival at hidden location.	Notification triggered.
MUT8.0	S13.2.0	Toggle autoplay functionality.	Autoplay set to be on/off.
MUT8.1	S13.3.0	Tap on social and leaderboard settings.	App moves to social screen.
MUT8.2	S13.3.1	Toggle leaderboard on/off settings	Leaderboard set to true/false for user.
MUT8.3	S13.3.2	Load a test name to leaderboard.	Name appears in leaderboard.



3.2 Integrated Tests

Test ID	Modules Integrated	Purpose of Test(s)	Test(s)	Desired Outcomes
MIT1.0	S04 S04.0.0 S04.1.0	Verify that the user unlocks new content and is notified of a new location via an animation upon arrival.	Trigger QR code scan of code for actual location.	Animation and sound effect notifying user of new location plays and app moves to next screen.
MIT1.1			Trigger QR code scan of invalid location.	Sound effect for incorrect code played and error message displayed.
MIT2.0	S02 S02.0.0 S02.1.0 S02.1.1 S02.2.0	Check that the zoom buttons work alongside the map and that the map displays correctly.	Load map, and trigger zoom buttons and move around map.	Map loads correctly, with major POIs, and zooms in/out upon zoom button activity and pans with movement.
MIT3.0	Mobile Iteration 1 (S02 + S04)	Simple check to ensure that there are no incompatibilities between the map modules and QR modules.	Integrate the modules.	Ensure no errors in code are flagged up.
MIT4.0	S05 S05.0.0 S05.1.0 S05.2.0	Ensure all progress measurement interfaces work.	Trigger tapping on progress bar.	App moves to screen displaying all unlocked locations.
MIT5.0	S07 S07.0.0 S07.1.0 S07.2.0 S07.2.1 S07.3.0 S07.3.1 S07.4.0 S07.4.1 S07.5.0 S07.5.1	Check that all types of content can be applied to a POI and all media types can be manipulated by the user.	Trigger a POI icon press.	All of the following are displayed on a scrollable content screen: (a) Opening Times (b) Text description. (c) Video that can be manipulated by the user. (d) Audio that can be manipulated by the user. (e) Zoomable photos.
MIT6.0	S08 S08.0.0 S08.0.1 S08.2.0	Check that all types of content can be applied to an sPOI and all media types can be	Trigger an sPOI icon press.	All of the following are displayed on a scrollable content screen:



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	S08.2.1 S08.3.0 S08.3.1	manipulated by the user.		(a) Text description. (b) Video that can be manipulated by the user. (c) Audio that can be manipulated by the user. (d) Zoomable photos.
MIT7.0	S12 S12.0.0 S12.1.0	Verify that hidden locations can be unlocked and the user notified.	Simulate arrival at a hidden location.	Location set to be visible and unlocked and notification displayed.
MIT8.0	S13 S13.0.0 S13.1.0 S13.2.0 S13.3.0 S13.3.0 S13.3.2	Ensure that user has total control over the application's settings and is able to engage with social aspects.	Enter settings menu.	(a) Social and leaderboard settings are visible. (b) Audio and notification settings are visible.
MIT8.1			Enter audio and notification settings.	(a) Audio level can be controlled. (b) Autoplay of media can be toggled. (c) Notifications can be set to on/off.
MIT8.2			Enter social and leaderboard settings.	(a) Social media options are displayed. (b) Leader board options are available (c) Username can be entered.
MIT9.0	S02 S03	Assert that the location of the user is accurately displayed on the movable, zoomable map.	Load map.	The current location can be displayed on the map and map can be interacted with.
MIT10.0	S02 S07 S08	Verify that POI icons and sPOI icons are displayed on map correctly and can be interacted with.	Load map.	POI icons are visible.
			Click on a POI icon.	Map zooms into POI and sPOIs and content pane become visible.



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			Click an sPOI icon.	Move to content screen.
MIT11.0	S06 S07	Check that POI content can be unlocked and accessed by a GPS arrival at a location.	Simulate GPS arrival at location.	App moves to content screen and all content types can be accessed.
MIT12.0	S04 S07	Check that POI content can be unlocked and accessed by scanning a QR code at a location.	Trigger QR scan.	App moves to content screen and all content types can be accessed.
MIT13.0	S07 S11	Verify that when in a POI content pane listening to audio, the phone can be locked and the audio will carry on playing.	Play sample audio when in a POI content pane and simulate locking phone.	Ensure that audio still plays.
MIT14.0	S07 S12	Display content from hidden locations.	Simulate arrival at hidden location.	App moves to content screen and all content types can be accessed.
MIT15.0	S02 S03 S06	Check the GPS unlocking mechanism based on the users location on the map.	Set user's GPS coordinate to a POI location.	Current location marker is at the POI and content is set to be unlocked.
MIT16.0	S02 S03 S06 S07	Unlock and access the content from a user GPS unlock.	Set user's GPS coordinate to a POI location.	Current location marker is at the POI and content is set to be unlocked and the content is accessible and can be interacted with.
MIT17.0	S02 S03 S06 S07 S12	Check the unlocking mechanism and accessing content for a hidden location.	Set user's GPS coordinate to a hidden location.	Current location marker is at the hidden and content is set to be unlocked and the content is accessible and can be interacted with.
MIT18.0	S02 S07 S03 S10	Display routes to guide a user around a location, using current location.	Load an example POI.	A suggested route is shown, with the users current location on display.
MIT19.0	S07 S13	Check that toggling autoplay in the settings has the desired effect on content.	Set autoplay to be on/off.	Content in content pane responds accordingly.



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MIT20.0	S05 S02	Verify that POIs status of being locked or unlocked is correctly displayed on the map.	Give one example POI that is locked and one that is unlocked.	POI's icon on map represents whether it is locked or unlocked.
MIT21.0	S05 S09	Check that rewards and achievements can be stored and displayed.	Input a reward.	Reward is displayed in progress tracking screen.



3.3 System Tests

Test ID	Test	Desired Outcomes
MST1.0	Open app	App loads to home screen (map)
MST1.1	Tap settings icon	Settings screen loads.
MST1.2	Tap on unlock bar	Screen showing all reward and unlocked location is displayed.
MST1.3	Tap on leaderboard.	Leaderboard loads.
MST1.4	Press back button when in any sub-menu	App returns to home screen.
MST1.5	Close app when in a sub-menu, and then reopen it.	App reopens in sub-menu it was in.
MST1.6	Kill app when in a sub-menu and reopen.	App reopens in main menu
MST2.0	Open app and look at map.	POIs are visible and have locked/unlocked icons. Sponsored businesses are visible.
MST3.0	Scan a QR for a location.	POI icon is unlocked. Map shows current location and sPOIs. Content becomes visible and can be played. Notification of new location flashes up on screen. Sound effect and animation plays. Suggested routes around the POI are visible.
MST3.1	Go to a POI's GPS location	POI icon is unlocked. Map shows current location and sPOIs. Content becomes visible and can be played. Notification of new location flashes up on screen. Sound effect and animation plays. Suggested routes around the POI are visible.
MST 3.2	Go to a hidden location.	Hidden location is unlocked. Content becomes visible and can be played. Notification of hidden location flashes up on screen. Sound effect and animation plays.
MST3.3	Turn off GPS and open map.	Error message displayed.
MST3.4	Click on any POI.	Map zooms in on this POI and, if unlocked, content is shown.
MST3.5	Click on an sPOI when in a POI screen.	Content about the sPOI is shown.



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MST4.0	Enter the settings menu and turn off notifications. Unlock a new location.	No notification is displayed.
MST4.1	Enter the settings menu and turn off sounds. Unlock a new location.	No sound effect upon unlocking.
MST4.2	Enter the settings menu and turn off autoplay. Got to a POI content screen.	Content does not play upon entering the content screen.
MST4.3	Enter the settings menu and turn off social media and leaderboards.	Social media is disabled and user does not appear in leaderboard.
MST4.4	Enter the settings menu and set a username.	Username appears on leaderboard.
MST4.5	Go to a POI content screen. Play audio content. Lock phone.	Audio keeps playing after phone is locked.
MST5.0	Go to a POI content screen. Scroll.	Content should scroll with user input.
MST5.1	Go to a POI content screen. Play the video. Pause the video. Stop the video. Change the current timestamp.	Video responds to user input as expected.
MST5.2	Go to a POI content screen. Play the audio. Pause the audio. Stop the audio. Change the current timestamp	Audio responds to user input as expected.
MST5.3	Go to a POI content screen. Zoom on a picture.	Picture responds to zooming.
MST6.0	Go to an sPOI content screen. Scroll.	Content should scroll with user input.
MST6.1	Go to an sPOI content screen. Play the video. Pause the video. Stop the video. Change the current timestamp.	Video responds to user input as expected.
MST6.2	Go to an sPOI content screen. Play the audio. Pause the audio. Stop the audio. Change the current timestamp	Audio responds to user input as expected.
MST6.3	Go to an sPOI content screen. Zoom on a picture.	Picture responds to zooming.
MST7.0	Unlock a location. Navigate to unlock progress screen.	New location appears in list of unlocked locations.



Kiosk Application Tests

4.1 Unit Tests

Test ID	User Story ID	Test Procedure	Desired Outcome
KUT1.0	S01.0.0	(a) Load up a sample XML document in the PWS XML format. (b) Load a document with incorrect format.	(a) Verify that the parser extracts the correct information for each field. (b) Check that an error message is displayed.
KUT1.1	S01.1.0	Load an XML.	File is in a dom structure.

4.2 Integrated Tests

Test ID	Modules Integrated	Purpose of Test(s)	Test(s)	Desired Outcome
KIT1.0	S02 S02.0.0 S02.1.0 S02.1.1 S02.2.0	Ensure the map loads correctly and can be interacted with by a user.	Load map, and trigger zoom buttons and movement around map.	Map loads correctly, with major POIs, and zooms in/out upon zoom button activity and pans with movement.
KIT1.0	Kiosk Iteration 1 (S01 + S02)	Check for module conflicts.	Integrate the modules.	There are no code errors.
KIT2.0	S07 S07.0.0 S07.1.0 S07.2.0 S07.2.1 S07.3.0 S07.3.1 S07.4.0 S07.4.1 S07.5.0 S07.5.1	Check that all types of content can be applied to a POI and all media types can be manipulated by the user.	Trigger a POI icon press.	All of the following are displayed on a scrollable content screen: (a) Opening Times (b) Text description. (c) Video that can be manipulated by the user. (d) Audio that can be manipulated by the user. (e) Zoomable photos.
KIT3.0	S08 S08.0.0 S08.0.1	Check that all types of content can be applied to an sPOI and all media	Trigger an sPOI icon press.	All of the following are displayed on a



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	S08.2.0 S08.2.1 S08.3.0 S08.3.1	types can be manipulated by the user.		scrollable content screen: (a) Text description. (b) Video that can be manipulated by the user. (c) Audio that can be manipulated by the user. (d) Zoomable photos.
KIT4.0	S13 S13.0.0 S13.1.0	Ensure that the audio settings on kiosks can be altered.	Enter settings menu and enter audio menu.	Option to alter audio level is displayed.
KIT5.0	S01 S07 S08	Check that content can be loaded to the content panes using the XML parser.	Load a sample text file, video, audio file and video.	Correct media is displayed in content panels.
KIT6.0	S02 S03	Assert that the location of the user is accurately displayed on the movable, zoomable map.	Load map.	The current location can be displayed on the map and map can be interacted with.
KIT7.0	S01 S02 S07 S08	Verify that POI and sPOI icons are correctly positioned and rendered on the map.	Load map.	POI icons are visible.
			Click on current location POI icon	Map zooms into POI and sPOIs and content panes become visible.
			Click a different POI.	Map zooms into POI but content is not shown and a message telling the user they must visit the location to access content is shown.
KIT8.0	S01 S02 S03 S07 S08	Ensure that location, POIs and sPOIs are displayed on map, and content for s/POIs can be loaded and manipulated.	Load map and click on current location POI icon.	Current location at POI is shown, and map zooms, showing all sPOIs for the location and all content.



KIT9.0	S07 S08 S13	Check that toggling sound in settings has the desired effect on content.	Change sound level in settings and go to a POI content pane.	Sounds respond to settings.
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4.3 System Tests

Test ID	Test	Desired Outcome
KST1.0	Load data for the current POI in PWS XML format to the kiosk. Click on current POI.	Content from XML file appears in content pane.
KST2.0	Start app.	Loads to main menu (map).
KST2.1	Click on settings icon.	App moves to settings menu showing admin controls and sound settings.
KST2.2	Click on POI location list.	Screen showing sPOIs at the location is shown.
KST2.3	Press the back button when in a sub-menu.	Return to main menu.
KST3.0	Click on current POI.	Map shows current location and sPOIs. Content is shown and can be played. Suggested routes around the POI are visible.
KST3.1	Click on another POI	Map zooms into POI. Message notifying user to visit location is displayed.
KST3.2	Click on an sPOI	Content is shown and can be played.
KST4.0	Enter the settings menu and click on admin controls.	Option to upload an XML file is shown.
KST4.1	Enter the settings menu and click on sound settings. Change sound settings. Go to POI content.	POI media responds to the sound setting.
KST5.0	View the map.	POI icons for all POIs are visible. Only POI icon for this kiosk is unlocked. Sponsored businesses are visible.
KST6.0	Go to current POI content screen. Scroll.	Content should scroll with user input.
KST6.1	Go to current POI content screen. Play the video. Pause the video. Stop the video. Change the current timestamp.	Video responds to user input as expected.



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KST6.2	Go to current POI content screen. Play the audio. Pause the audio. Stop the audio. Change the current timestamp.	Audio responds to user input as expected.
KST6.3	Go to current POI content screen. Zoom on a picture.	Picture responds to zooming.
KST7.0	Go to an sPOI content screen. Scroll.	Content should scroll with user input.
KST7.1	Go to an sPOI content screen. Play the video. Pause the video. Stop the video. Change the current timestamp.	Video responds to user input as expected.
KST7.2	Go to an sPOI content screen. Play the audio. Pause the audio. Stop the audio. Change the current timestamp	Audio responds to user input as expected.
KST7.3	Go to an sPOI content screen. Zoom on a picture.	Picture responds to zooming.



5 Contracted Module Testing

5.1 Module Tests

Module	Selling to	Test ID	Test	Desired Outcomes
Image	YSD	CT1.0	(a) Pass a .jpg image into the handler. (b) Pass a .png image into the handler. (c) Pass a .gif file into the handler.	Correct image type displayed.
		CT1.1	Pass a test location and resolution into the handler.	Image appears at correct location and with correct resolution.
		CT2.0	Pass a test image and new size into the crop tool.	Image is resized to new specification.
		CT2.1	Pass a test image and new size into the crop tool.	Areas of the image outside the new size are not visible.
		CT3.0	Use zoom functionality – hover over an image.	Lens window with zoomed image appears with mouse location.
		CT3.1	Use zoom functionality near the edge of an image.	Lens window does not extend past image window.
Video	YSD	CT4.0	Test time seeking bar – set it to be set to a certain time.	The video moves to the point specified by the bar.
		CT4.1	(a) Trigger volume slider movement. (b) Set volume to minimum.	(a) Volume value changes accordingly. (b) Volume icon changes to mute icon.
		CT4.2	Trigger pause/play button press.	Video set to pause/play and icon changes.
		CT4.3	Change speed of playback with GUI.	Video speed set to change according to selection.
		CT4.4	Change icon filepath.	Icon on display changes
		CT5.0	Pass a video file and new start and end times into video cropper.	String to cropped file returned.



6 Pass/Fail Criteria and Progression

6.1 Unit Testing

All unit tests must be passed before a unit can be considered to be completely built. Once a unit has passed a unit test it is then ready to be moved on to integrated testing.

6.2 Integrated Testing

All integrated tests must pass before the testing process can progress to the final system testing stage. This is to ensure that all modules will work together as intended in the final system. If an integrated test fails, then the cause of the failure must be identified and then the unit causing the failure must be edited. When a unit is edited it must once again pass the unit test before it can be used again for the integrated test.

6.3 System Testing

Once all integrated tests have successfully passed, system testing can begin. To ensure a high-quality and fully operational final product it is imperative that the product passes these tests. If time and resources become an issue, then the final allowable percentage of tests failing at this stage is 5% and only where a sub-feature has failed. All main features must be operational.